House of Commons
Welsh Affairs Committee

Energy in Wales

Third Report of Session 2005–06

Volume II

Oral and written evidence

Ordered by The House of Commons
to be printed 11 July 2006
The Welsh Affairs Committee

The Welsh Affairs Committee is appointed by the House of Commons to examine the expenditure, administration, and policy of the Office of the Secretary of State for Wales (including relations with the National Assembly for Wales.)

Current membership

Dr Hywel Francis MP (Chairman) (Labour, Aberavon)
Mr Stephen Crabb MP (Conservative, Preseli Pembrokeshire)
David T. C. Davies MP (Conservative, Monmouth)
Nia Griffith MP (Labour, Llanelli)
Mrs Siân C. James MP (Labour, Swansea East)
Mr David Jones MP (Conservative, Clwyd West)
Mr Martyn Jones MP (Labour, Clwyd South)
Albert Owen MP (Labour, Ynys Môn)
Jessica Morden MP (Labour, Newport East)
Hywel Williams MP (Plaid Cymru, Caernarfon)
Mark Williams MP (Liberal Democrat, Ceredigion)

Powers

The Committee is one of the departmental select committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No 152. These are available on the Internet via www.parliament.uk.

Publications

The Reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the Internet at www.parliament.uk/parliamentary_committees/welsh_affairs_committee.cfm. A list of Reports of the Committee in the present Parliament is at the back of this volume.

Committee staff

The current staff of the Committee are James Davies (Clerk), Dr Rebecca Davies (Committee Specialist), Jane Trew (Committee Assistant), Sarah Colebrook (Secretary) and Jim Lawford (Senior Office Clerk).

Contacts

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Gordan MacDonah
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David T Williams
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Professor Peter Cobbold
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June and David Whitehead
S.R. Hull
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Sandra Williams
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Mrs June M. Flint
Geoffrey Flint
Mark Robinson
Samantha Robinson
Alice Robinson
Charlotte Robinson
Mrs Elaine Pritchard
N. Whiteman
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Mrs R.J. and Mr G.P. Davies
Mrs Sheila Malpass
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N. Gildart
Stewart Williams
Mrs C Lewis
Debra Spencer
John G. Phillips
F Malem
Jennifer Sly-Benbow
Philip Vallance
Cllr Paul Marfleet, Denbighshire County Council
Eileen Sillitoe
David Haskell
I M and E Haigh
Molly Lear
Naomi Klenerman
Janet Haworth, Save our Scenery
Gary Bick

Other submissions
Welsh Energy Research Centre
Kevin Mowbray, Head of Secretariat, Welsh Energy Research Centre
All Wales Energy Group
David Bellamy
Prof Dennis Hawkes
Jack Harris
Neil S Thomas
Richard Buxton
Ivor Russell,
WWF Cymry
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Gillian Walker
Ken Sawyer, Neath Port Talbot Council
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Taken before the Welsh Affairs Committee

on Tuesday 31 January 2006

Members present:

Dr Hywel Francis, in the Chair

David T C Davies Jessica Morden
Mrs Siân C James Hywel Williams
Mr David Jones Mark Williams

Written Evidence from the Department of Trade and Industry

WELSH AFFAIRS COMMITTEE
THE “ENERGY IN WALES” INQUIRY

OVERVIEW

1. The Energy White Paper published in February 2003 set out the overarching long-term framework for energy policy, based on four goals:
   — To put ourselves on a path to cut the UK’s carbon dioxide emissions by some 60% by about 2050, with real progress by 2020.
   — To maintain the reliability of energy supplies.
   — To promote competitive markets in the UK and beyond, helping to raise the rate of sustainable economic growth and to improve our productivity.
   — To ensure that every home is adequately and affordably heated.

2. We continue to believe that the goals set out in the Energy White Paper provide the right framework for our energy policy, and that they are achievable. Within that strategic context it gave high priority to energy efficiency and renewables but also emphasised that it could not define the detail of individual policies needed over the next twenty years and beyond. We keep our progress and our policies under review, for example through the Climate Change Programme Review and the recently announced Energy Review.

3. The Prime Minister and the Secretary of State for Trade and Industry announced an Energy Review on 29 November that will bring forward policy proposals next year. The Review is broad in scope and will include aspects of both energy supply and energy demand, including energy efficiency and transport. It will focus on policy measures to help us deliver our objectives in the medium and long term as set out in the 2003 Energy White Paper. The National Assembly Government is already involved in the Review and will continue to be throughout its course.


5. On 20 June 2005, the Welsh Assembly Government launched for consultation the Welsh Energy Route Map, its agenda for the future of energy policy in Wales. This builds on existing strategies and sets out a vision and a wide range of actions to establish Wales as a global showcase for clean, safe energy production and energy efficiency. The focus of the new strategy is on pursuing a clean and high efficiency energy policy through renewable energies including a strong base for marine renewables sector, cleaner fossil-fuel technologies, raising the profile of energy efficiency, strengthening Wales’s energy infrastructure (including its energy research and innovation base), increasing security of electricity and gas supplies and enhancing energy efficiency efforts (including promotion of realistic microgeneration options). The Energy Route Map was endorsed by the Welsh Assembly in a plenary debate on 9 November 2005.

1. UK GOVERNMENT POLICY IN RELATION TO
   (a) the current and future energy needs of Wales; and
   (b) the current and future provision of energy in Wales.

1 In its 2005 Manifesto, the Government stated its commitment to achieving a 20% reduction in carbon dioxide emissions below 1990 levels by 2010.
UK Energy Projections for supply and demand

6. Based on current DTI Energy Projections, between 2005 and 2020, total UK electricity generation is projected to increase by 5.5%. These are central projections, but there is a wide range of possible scenarios, depending on various factors including decisions by generators made in response to market conditions and other regulatory factors.

7. DTI published updated details of energy and emission projections in November 2004 in order to inform decisions about the National Allocation Plan under the first phase of EU Emissions Trading. The projections listed the main changes that had been taken into account in making the revisions. An addendum was published soon after which showed the projections to 2020.²

8. The fuel demand projections by final users indicate gradually rising demand to 2010 and 2020, though this is not true for all individual sectors. The projections take into account factors such as growth in population, households (eg the increase in single-person households) and transport. They assess the impact of only current environmental policy measures in looking beyond 2010. They will be updated to reflect the expected impact of any new policies proposed by the Climate Change Programme Review, due to report around the turn of the year.

9. The table below summarises the projections by sector in comparison with recent actual figures (drawn from the Energy Projections).

<table>
<thead>
<tr>
<th>Sector</th>
<th>2003</th>
<th>2010</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>47.9</td>
<td>44.7</td>
<td>46.6</td>
</tr>
<tr>
<td>Transport</td>
<td>56.0</td>
<td>62.2</td>
<td>71.4</td>
</tr>
<tr>
<td>Service</td>
<td>19.5</td>
<td>21.5</td>
<td>21.9</td>
</tr>
<tr>
<td>Industry (excl iron and steel)</td>
<td>31.7</td>
<td>31.7</td>
<td>35.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>155.1</strong></td>
<td><strong>160.0</strong></td>
<td><strong>175.4</strong></td>
</tr>
</tbody>
</table>

10. The Projections also cover the pattern of electricity generation by fuel source (though they do not take into account impacts of the EU Emissions Trading Scheme, launched in January 2005). The table below (also drawn from the DTI Energy Projections) summarises projections extended to 2010, 2015 and 2020.

<table>
<thead>
<tr>
<th>Fuel Source</th>
<th>2000 (%)</th>
<th>2005 (%)</th>
<th>2010 (%)</th>
<th>2015 (%)</th>
<th>2020 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>111.9 (32)</td>
<td>116 (32)</td>
<td>90 (26)</td>
<td>81 (22.6)</td>
<td>62 (16.3)</td>
</tr>
<tr>
<td>Oil</td>
<td>2.1 (0.5)</td>
<td>2 (0.5)</td>
<td>2 (0.5)</td>
<td>1 (0.2)</td>
<td>1 (0.5)</td>
</tr>
<tr>
<td>Gas</td>
<td>127.0 (37)</td>
<td>135 (38)</td>
<td>145 (41)</td>
<td>167 (46.5)</td>
<td>221 (58.1)</td>
</tr>
<tr>
<td>Nuclear</td>
<td>78.3 (23)</td>
<td>80 (22)</td>
<td>65 (19)</td>
<td>41 (12)</td>
<td>27 (7.1)</td>
</tr>
<tr>
<td>Renewables&lt;sup&gt;2&lt;/sup&gt;</td>
<td>10.1 (3)</td>
<td>15 (4)</td>
<td>40 (11)</td>
<td>58 (16)</td>
<td>58 (15.5)</td>
</tr>
<tr>
<td>Imports</td>
<td>14.3 (4)</td>
<td>10 (3)</td>
<td>8 (2)</td>
<td>8 (2.2)</td>
<td>8 (2)</td>
</tr>
<tr>
<td>Pumped storage</td>
<td>2.6 (0.5)</td>
<td>2 (0.5)</td>
<td>2 (0.5)</td>
<td>2 (0.5)</td>
<td>2 (0.5)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>346.3 (100)</strong></td>
<td><strong>361 (100)</strong></td>
<td><strong>352 (100)</strong></td>
<td><strong>359 (100)</strong></td>
<td><strong>381 (100)</strong></td>
</tr>
</tbody>
</table>

**Notes:** Figures for 2015 and 2020 are provisional.
(1) The figures in this table relate to gross supply to the grid, plus imports of electricity.
(2) In line with the Renewables Obligations, the level of renewables generation in 2010 is approximately 10% of overall generation. In 2015 it is approximately 15%.

Energy Statistics for supply and demand

11. The Government publishes statistics on UK energy generation, supply and demand in the Digest of UK Energy Statistics (DUKES).³ Table 5.11 from DUKES lists the individual power stations in operation in the UK and an extract from that, listing power stations in Wales, appears here at Annex A.

12. DTI has also recently begun to publish regional data on electricity consumption in our quarterly

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Energy Trends publication and a table showing electricity consumption in Wales, Scotland and the English Regions is at Annex B. Energy Trends has also featured articles on gas consumption and electricity generation and generators’ fuel use in Wales (December 2004); and on renewables and CHP in Wales (September 2005). Updates to the December 2004 articles will be published in the next issue, due to be published in early January 2006.

UK Energy efficiency policy

13. Energy efficiency has been identified as the most cost effective way to deliver all four of the Government’s energy policy goals, as set out in the Energy White Paper, including those to reduce carbon emissions and ensure security of supply.

14. In April 2004, Energy Efficiency: The Government’s Plan for Action (the Action Plan) was published, following up the Energy White Paper and setting out the Government’s strategy for improving energy efficiency across the economy, with a particular focus to 2010. The Action Plan set out how the Government planned to secure annual carbon savings of 12 million tonnes by 2010 and save UK households and businesses over £3 billion per year on their energy bills. The Action Plan aims to deliver a step-change in energy efficiency, using a combination of strong, consistent Government action including regulatory mechanisms, fiscal incentives, leadership, awareness-raising and education, coupled with effective market-facing support programmes delivered by organisations like the Carbon Trust and the Energy Saving Trust.

15. Key measures which impact across the UK include:
   — raising building standards through the Building Regulations, which specify minimum requirements for the energy performance of new and refurbished buildings;
   — the Climate Change Levy—a revenue-neutral tax on the business use of energy;
   — the Climate Change Agreements, which provide eligible businesses with a discount to the Levy if they meet carbon emissions targets; and
   — work to improve energy efficient product design, labelling and minimum standards.

16. Within the UK Action Plan, around 20% of the energy savings (and about 35% of the carbon savings) are expected to be from electricity demand.

17. Within the current review of the Climate Change Programme, the Government is also looking across the economy, at what new or strengthened policies and measures could best contribute to the long-term step change in energy efficiency. The Welsh Assembly Government is participating in this review. The Energy Efficiency Innovation Review, as an input to the Climate Change Programme Review, has looked in detail at the key low-carbon technologies where further support could make a significant difference to delivery.

2. The Relationship Between the UK Government and the National Assembly for Wales—Including the Division of Powers—on Energy Policy

18. Energy policy is largely a reserved issue, however there are some specific aspects of energy policy that are devolved to the Welsh Assembly Government (see Annex C for an outline of reserved and devolved issues). We highlight below (and also in the following Section 3) some of the most significant of these.

Consents

19. There are three key sets of functions that are relevant to a proposal to develop electricity generating stations—those in the Transport and Works Act 1992, sections 36 and 37 of the Electricity Act 1989 and the Town and Country Planning Act 1990.

20. Powers to make Orders in respect of offshore generating stations of any size under the Transport and Works Act 1992 are vested in the Assembly in relation to Wales. The Assembly is also the authorising body for marine projects in respect of the Food and Environmental Protection Act 1985.

21. The Assembly also exercises Town and Country Planning Act 1990 powers in relation to Wales that are equivalent to those of the Secretary of State in England, including those that relate to planning policy and applications for planning consent. This means that in relation to generating stations of 50 megawatts (MW) or less where applications for planning consent are made under the 1990 Act to the local planning authority, the Assembly has the ability to call in those applications. It also determines any appeals against planning authority decisions.

22. The Assembly is also responsible for formulating non-statutory planning policy and guidance (which includes policy and guidance on renewable energy) in relation to Wales in the same way that the Secretary of State would for England.

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5 http://www.defra.gov.uk/environment/energy/review/index.html
23. However, the Assembly plays no formal part in the decision-making process for power stations over 50MW. These powers, under Sections 36 and 37 of the Electricity Act 1989, are fully reserved at the UK level and provide for the approval of the construction, extension and operation of a generating station over 50 MW and the installation of above ground electricity lines. However the Welsh Assembly is consulted by DTI on all Section 36 consent applications for projects in Wales.

24. In 2003, the Assembly formally requested a formal transfer of these powers and a Tripartite Working Group of officials from the Wales Office, DTI and the Welsh Assembly Government has been considering the matter in consultation with industry stakeholders with a view to presenting options for Ministers to consider. It is hoped to report the conclusions of the Group to Ministers during 2006.

Energy Efficiency

25. Building on the UK Action Plan (see paragraph 14 above), Wales has adopted its own energy efficiency targets, as required under the Sustainable Energy Act 2003. The Assembly Government published Energy Saving Wales, its energy efficiency action plan, in October 2004 following extensive consultation. Implementation of the plan is underway and this will have a key role in reducing carbon emissions through cost effective measures.

Fuel Poverty

26. The Government reported on progress in addressing fuel poverty in The UK Fuel Poverty Strategy Third Annual Progress Report, published in July 2005, and outlined action and progress within each nation. The Welsh Assembly Government’s target is, that as far as reasonably practicable, no household in Wales should be living in fuel poverty by 2018. As in England, the Welsh Assembly Government is increasing the already substantial financial support for energy efficiency measures under the Home Energy Efficiency Support Scheme.

3. The Current and Future Portfolio of Energy Provision in Wales Including: Nuclear Energy; Liquefied Natural Gas; Clean Coal Technology; Wind Farms; Biomass Energy; Geothermal Energy; Tidal and Wave Energy; Hydroelectric Energy

27. In the following paragraphs we cover each technology or energy source in turn, addressing both UK policy and support mechanisms and specific issues in relation to Wales.

Nuclear Energy

28. The 2003 Energy White Paper set out the Government’s policy on nuclear generation, namely that while it was an important source of carbon-free electricity its current economics made it an unattractive option for new carbon-free generating capacity and that there were also important issues of nuclear waste to be resolved. However, it did not rule out the possibility that at some point in the future new nuclear build might be necessary if we were to meet our carbon targets. It stated that before building any new nuclear power stations there would have to be the fullest public consultation and a white paper setting out our proposals. The Prime Minister has said that a decision on nuclear power will need to be taken during this Parliament and the Energy Review will consider the potential contribution of civil nuclear power alongside other options for meeting the goals of energy policy. The Review will maintain close liaison with the Devolved Administrations.

29. There is one nuclear power station in Wales that remains in operation. The Wylfa power station on Anglesey, North Wales is currently expected to cease operations in 2010.


Liquefied Natural Gas

31. Two new LNG import terminals at Milford Haven are being built—by Qatargas/ExxonMobil, and a consortium of companies led by Petroplus, respectively. They are planned to come on stream in 2007–08. Alongside these developments, it is possible that large-scalenew gas-fired power stations may also be built.

32. National Grid recently announced its preferred route for the gas pipeline from Felindre, near Swansea to Tirley, between Newent and Tewkesbury in Gloucestershire.

6 Though these powers have been executive devolved to Scottish Ministers in respect of Scotland and its territorial waters.
8 Set out in Fuel Poverty Commitment for Wales at http://www.housing.wales.gov.uk/pdf.asp?a=d10
**Clean Coal Technology**

33. The Government’s Carbon Abatement Technologies Strategy was published in June 2005.\(^9\) The Government is spending just over £50 million between 2002 and 2008 to help emerging renewable and low carbon technologies, in the form of R&D spending and funding for capital grants. Industry-led collaborative R&D is also supported through the Technology Programme, which provides least £20 million each year and also through the EPSRC/Carbon Trust’s Carbon Vision programme which provides around £9 million total over five years. Under the SuperGen initiative the EPSRC will be funding research in to Conventional Power Plant Lifetime Extension.

34. Uskmouth power station in Newport already utilises flue gas desulphurisation and Aberthaw power station in the Vale of Glamorgan is also expected to fit this technology.

35. Tower Colliery has been awarded a total of £3 million Coal Investment Aid during 2003–06 to maintain access to its remaining reserves and protect mining jobs in a socially and economically disadvantaged area. The colliery is expected to close, owing to exhaustion, in 2008. It currently provides around 0.5 million tonnes of coal a year to Aberthaw power station which, with an installed capacity of 1,455 megawatts, represents around 60% of generating capacity in South Wales.

36. Tower has captured coal mine methane released from its workings for surface use for many years and it also recently built a briquetting plant to combine coal and wood waste into a part-biomass fuel.

37. There are currently seven surface mines and three deep mines (including Tower) in operation in Wales, together producing around two million tonnes of coal per year. The Coal Authority has indicated that substantial coal reserves remain in South Wales, a significant proportion of which are suitable for surface mining. The Authority has recently issued a licence for a new deep coking coal mine at Margam. As in the rest of the UK, the potential of substantial deep coal seams may one day be exploited by underground coal gasification.

**Wind farms**

38. The UK benefits from vast natural renewable resources particularly wind, wave and tidal. However, in meeting the 2010 target,\(^10\) we expect wind, both onshore and offshore, to make the biggest contribution. At present, onshore wind is the only renewable technology that is both economically viable and has scope for expansion under the current Renewables Obligation (RO) regime in the UK. Its geography and wind patterns give Wales an important role in delivering the windpower required to meet our renewables targets.

39. The Government is making good progress against its challenging 2010 renewables target. In 2004, 3.6% of electricity supplies came from renewable energy. In June this year the UK passed the gigawatt wind barrier, and with a further 800 MW of wind capacity under construction, and 1700 MW with consent, we are seeing a step change in the amount of new renewable generating capacity coming through.

40. There are 20 major onshore windfarms in Wales. The UK’s largest onshore wind farm, at Cefn Croes in Mid-Wales, was commissioned in June 2005. Last autumn the UK’s first offshore wind farm, at North Hoyle off the North Wales coast, became operational. A further offshore wind farm at Rhyl Flats has development consent and a much larger project is planned for Gwynt y Mor, both are off the North Wales coast.

41. Although energy policy is a reserved function, planning is devolved. The Welsh Assembly has published planning guidance through TAN 8 that will facilitate the development of renewable energy. This includes strategic planning guidance on the preferred location of large (25 MW and above) new onshore windfarms in Wales to meet the Assembly targets of 4TWh by 2010.

**Biomass**

42. Biomass has the potential to supply around 6% of electricity demand by 2020 and the UK Government is supporting the bio-energy industry with a package of measures to help establish the crops, develop supply chains and create markets. This includes working with farmers and industry to develop markets and promote uptake of bioenergy from purpose-grown energy crops, forestry and other sources such as biodegradable waste. The Committee will also be aware that the Biomass Taskforce, led by Sir Ben Gill, has recently presented its recommendations and Government is preparing its response.

43. Although in Wales there is no specific energy crop scheme, the Assembly has focused its resources on expanding demand for energy crops rather than risk oversupply of a fledgling market. This has been done through schemes such as the Wood Energy Business Scheme—a £7 million capital grant scheme for woodfuel processing and burning equipment. Other Welsh initiatives include the ring fencing of a proportion of the Assembly small roundwood by the Forestry Commission to supply the developing woodfuel sector, and support for the development of Welsh-based energy crop trials and knowledge through

\(^{9}\) [www.dti.gov.uk/energy/coal/cft/catstrategy.shtml](http://www.dti.gov.uk/energy/coal/cft/catstrategy.shtml)

\(^{10}\) Our target is that by 2010 10% of electricity supplies should come from renewable sources, with an aspiration to double this by 2020.
“Willows for Wales” and the Centre for Alternative Land Use. Wales has also benefited from the UK-wide Bioenergy Capital Grant Scheme, which provided £66 million to encourage the development of biomass power plants, for example at Port Talbot.

44. The Welsh Assembly Government’s Energy Route Map included plans to publish a biomass energy strategy for Wales with relevant targets by mid 2006. This will take a holistic view of potential biomass developments, taking into account the findings of the recent Gill and Carbon Trust reviews and the existence of the relevant world class expertise at the Institute of Grasslands and Environmental Research (IGER) at Aberystwyth.

Geothermal energy

45. The Government published in 2002 Assessment of Technological Options to address Climate Change—A Report for the Prime Minister’s Strategy Unit. Cost remains a significant barrier to geothermal energy however its potential globally is significant and we will continue to keep it under consideration.

Wave and tidal

46. In November 2005, DTI published guidance on uniform consenting arrangements for England and Wales for a pre-commercial demonstration phase for wave and tidal stream energy devices (marine renewables).

47. The consenting guidance complements the DTI “Wave and Tidal Stream Energy Demonstration Scheme” worth up to £42 million that will support the first larger-scale wave and tidal farms. A call for bids for funding will be made during the first part of 2006. This funding is the major part of the £50 million “Marine Renewables Deployment Fund” announced last year. This will continue to be underpinned by industry led research and development. The £8 million balance will be used to initiate a programme of work in the following areas:
- monitoring and environmental research relating to demonstration devices (up to £2 million);
- resources;
- standards and infrastructure.

48. Elements of the consenting arrangements and the funding scheme complement other activities such as the Research Councils’ “Supergen” Marine Consortium and the European Marine Energy Centre.

49. Wales has significant wave and tidal resources and potential for marine renewables generation projects and DTI will work with the Welsh Assembly Government to help exploit these natural advantages. The funding available under the Wave and Tidal Stream Energy Demonstration Scheme will be open to competition for developers across the whole UK.

50. Financial support for wave and tidal projects has also been offered to developers by the Welsh Assembly Government through the Structural Funds programme for West Wales and the Valleys.

Hydroelectric

51. Currently, of the renewable energy supplied across the United Kingdom, in 2003 roughly 30% came from hydropower. However, opportunities to deploy this technology within the UK are now becoming more limited, not only because most of the economically attractive sites for schemes have already been exploited but also environmental concerns are limiting the further development of this technology.

Microgeneration

52. An Energy Saving Wales internet portal is about to be launched and a new microgeneration strategy is being prepared under the auspices of the Welsh Assembly Government’s Energy Route Map.

53. Photovoltaic (PV) technology, along with all the other microgeneration technologies, has an important contribution to make in reducing carbon emissions, especially in the light of expectations of falling costs of the technology. The Government has provided funds through the major PV demonstration programme, of £431 million from 2002–06 and just over 100 projects in Wales have been offered funding. Sharp has based its principal PV production site for Europe in Wrexham, North Wales.

54. PV installations are also funded under the Clear Skies scheme, which provides support for a range of microgeneration technologies in household and community installations. This scheme has provided £12.5 million-worth of funding between 2003 and 2006.

55. Both the major PV demonstration programme and the Clear Skies Initiative will end in March 2006. From April 2006, support for all microgeneration technologies will be via the Low Carbon Buildings Programme, which will take a more holistic approach to reducing carbon emissions from buildings. The Government is due to publish its Microgeneration Strategy in April 2006.

9 December 2005
### Annex A

**POWER STATIONS IN WALES (OPERATIONAL AT THE END OF MAY 2005)\(^{(1)}\)**

<table>
<thead>
<tr>
<th>Station</th>
<th>Company</th>
<th>Fuel</th>
<th>Capacity (MW)</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penryddian &amp; Llidiartywaun</td>
<td>ScottishPower</td>
<td>Wind</td>
<td>31</td>
<td>1992</td>
</tr>
<tr>
<td>Baglan Bay</td>
<td>Baglan Generation Ltd</td>
<td>Gas turbine</td>
<td>575</td>
<td>2002</td>
</tr>
<tr>
<td>Taff Ely</td>
<td>Beaufort Wind Ltd</td>
<td>Wind</td>
<td>9</td>
<td>1993</td>
</tr>
<tr>
<td>Bryn Titli</td>
<td>Beaufort Wind Ltd</td>
<td>Wind</td>
<td>10</td>
<td>1994</td>
</tr>
<tr>
<td>Trysgwyn</td>
<td>Beaufort Wind Ltd</td>
<td>Wind</td>
<td>6</td>
<td>1996</td>
</tr>
<tr>
<td>Carno</td>
<td>Beaufort Wind Ltd</td>
<td>Wind</td>
<td>34</td>
<td>1996</td>
</tr>
<tr>
<td>Llyn Alaw</td>
<td>Beaufort Wind Ltd</td>
<td>Wind</td>
<td>20</td>
<td>1997</td>
</tr>
<tr>
<td>Mynydd Gorddu</td>
<td>Beaufort Wind Ltd</td>
<td>Wind</td>
<td>10</td>
<td>1996</td>
</tr>
<tr>
<td>Solutia District Energy</td>
<td>British Energy</td>
<td>Gas</td>
<td>10</td>
<td>2000</td>
</tr>
<tr>
<td>Uskmouth</td>
<td>Uskmouth Power Company Ltd</td>
<td>Coal</td>
<td>393</td>
<td>2000</td>
</tr>
<tr>
<td>Aberdare District Energy</td>
<td>British Energy</td>
<td>Gas</td>
<td>10</td>
<td>2002</td>
</tr>
<tr>
<td>Wyfia</td>
<td>BNFL British Nuclear Group</td>
<td>Nuclear</td>
<td>980</td>
<td>1971</td>
</tr>
<tr>
<td>Maentwrog</td>
<td>BNFL British Nuclear Group</td>
<td>Hydro</td>
<td>28</td>
<td>1928</td>
</tr>
<tr>
<td>Cemmasaes</td>
<td>Cemmasaes Windfarm Ltd</td>
<td>Wind</td>
<td>15</td>
<td>2002 (^{(3)})</td>
</tr>
<tr>
<td>Barry</td>
<td>Centrica</td>
<td>CCGT</td>
<td>250</td>
<td>1998</td>
</tr>
<tr>
<td>Connahs Quay</td>
<td>Energy on UK</td>
<td>CCGT</td>
<td>1,380</td>
<td>1996</td>
</tr>
<tr>
<td>Rheidol (Hydro)</td>
<td>Energy on UK</td>
<td>Hydro</td>
<td>49</td>
<td>1961</td>
</tr>
<tr>
<td>Rheidol (Wind)</td>
<td>Energy on UK</td>
<td>Wind</td>
<td>2</td>
<td>1997</td>
</tr>
<tr>
<td>Shotton</td>
<td>Gaz de France</td>
<td>Gas CHP</td>
<td>180</td>
<td>2001</td>
</tr>
<tr>
<td>Deeside</td>
<td>International Power</td>
<td>CCGT</td>
<td>500</td>
<td>1994</td>
</tr>
<tr>
<td>Dinorwig</td>
<td>IPM Energy Ltd</td>
<td>Pumped storage</td>
<td>1,728</td>
<td>1983</td>
</tr>
<tr>
<td>Ffestiniog</td>
<td>IPM Energy Ltd</td>
<td>Pumped storage</td>
<td>360</td>
<td>1961</td>
</tr>
<tr>
<td>Llangwyryfon</td>
<td>Llangwyryfon Windfarm Ltd</td>
<td>Wind</td>
<td>9</td>
<td>2003 (^{(3)})</td>
</tr>
<tr>
<td>North Hoyle</td>
<td>Npower Renewables</td>
<td>Wind (off shore)</td>
<td>60</td>
<td>2003</td>
</tr>
<tr>
<td>Aberthaw B</td>
<td>RWE Npower Plc</td>
<td>Coal</td>
<td>1,455</td>
<td>1971</td>
</tr>
<tr>
<td>Aberthaw GT</td>
<td>RWE Npower Plc</td>
<td>Gas oil</td>
<td>51</td>
<td>1971</td>
</tr>
<tr>
<td>Cwm Dyli</td>
<td>RWE Npower Plc</td>
<td>Hydro</td>
<td>10</td>
<td>2002 (^{(3)})</td>
</tr>
<tr>
<td>Dolgarrog High Head</td>
<td>RWE Npower Plc</td>
<td>Hydro</td>
<td>18</td>
<td>2002 (^{(3)})</td>
</tr>
<tr>
<td>Dolgarrog Low Head</td>
<td>RWE Npower Plc</td>
<td>Hydro</td>
<td>15</td>
<td>1926–2002</td>
</tr>
</tbody>
</table>

Total capacity: \(8,198\) MW

**Source:** Digest of UK Energy Statistics, Table 5.11

(1) This list covers stations of more than 1 MW capacity.

(2) This station was in the process of being sold to International Power in Summer 2005.

(3) Recommissioning date.

### Annex B

**Table 5B

ELECTRICITY CONSUMED, 2003**

<table>
<thead>
<tr>
<th></th>
<th>Domestic sector sales (GWh)</th>
<th>Number of domestic customers (thousand)(^{(1)})</th>
<th>Industrial and commercial sector sales (GWh)</th>
<th>Number of I &amp; C customers (thousand)(^{(1)})</th>
<th>All consumers sales (GWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wales</td>
<td>5,196</td>
<td>1,212</td>
<td>9,961</td>
<td>99</td>
<td>15,158</td>
</tr>
<tr>
<td>Scotland</td>
<td>12,738</td>
<td>2,637</td>
<td>16,407</td>
<td>217</td>
<td>29,145</td>
</tr>
<tr>
<td>North East</td>
<td>4,538</td>
<td>1,158</td>
<td>7,684</td>
<td>83</td>
<td>12,222</td>
</tr>
<tr>
<td>North West</td>
<td>12,760</td>
<td>3,006</td>
<td>20,739</td>
<td>241</td>
<td>33,499</td>
</tr>
<tr>
<td>Yorkshire and the Humber</td>
<td>9,442</td>
<td>2,227</td>
<td>13,483</td>
<td>177</td>
<td>22,925</td>
</tr>
<tr>
<td>East Midlands</td>
<td>8,512</td>
<td>1,852</td>
<td>14,058</td>
<td>157</td>
<td>22,570</td>
</tr>
<tr>
<td>West Midlands</td>
<td>10,609</td>
<td>2,265</td>
<td>11,062</td>
<td>190</td>
<td>21,670</td>
</tr>
<tr>
<td>East of England</td>
<td>12,038</td>
<td>2,387</td>
<td>14,858</td>
<td>211</td>
<td>26,896</td>
</tr>
<tr>
<td>Greater London</td>
<td>13,786</td>
<td>3,206</td>
<td>25,651</td>
<td>421</td>
<td>39,437</td>
</tr>
<tr>
<td>South East</td>
<td>17,219</td>
<td>3,477</td>
<td>22,898</td>
<td>339</td>
<td>40,116</td>
</tr>
<tr>
<td>South West</td>
<td>11,413</td>
<td>2,265</td>
<td>13,183</td>
<td>232</td>
<td>24,597</td>
</tr>
<tr>
<td>Unallocated Consumption</td>
<td>503</td>
<td>122</td>
<td>19,540</td>
<td>66</td>
<td>20,042</td>
</tr>
<tr>
<td>Sales direct from high voltage lines (^{(2)})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9,210</td>
</tr>
<tr>
<td>Great Britain</td>
<td>118,754</td>
<td>25,814</td>
<td>189,523</td>
<td>2,433</td>
<td>317,487</td>
</tr>
<tr>
<td>Northern Ireland (^{(3)})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6,710</td>
</tr>
<tr>
<td>Total (^{(4)})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>324,197</td>
</tr>
</tbody>
</table>
(1) Figures are the number of Meter Point Administration Numbers (MPANs); every metering point has this unique reference number.

(2) Based on estimate provided by Elexon Ltd.

(3) Northern Ireland data are based on data for electricity distributed provided by Northern Ireland Electricity.

(4) This is close to the figure for UK electricity sales in 2003 of 324,333 GWh shown in Table 5.5; see the article cited in paragraph 5.18 for the reasons for this small statistical difference.

Source: DTI Energy Trends

Annex C

ENERGY—DIVIDE BETWEEN RESERVED/DEVOLVED POWERS

While responsibility for energy policy in Great Britain is reserved to the DTI, a number of areas relating to energy policy are devolved to Wales. Wales is part of the integrated England and Wales electricity generation and supply network.

It should be noted that the National Assembly for Wales also has a cross-cutting duty under the Government of Wales Act to promote sustainable development across all of its activities.

The list below outlines the key areas that impact on energy policy that are devolved or not devolved to the National Assembly for Wales:

**DEVOLVED/TRANSFERRED/HANDED BY THE PLANNING REGIME IN WALES WHICH NAW OVERSEE**

- Environment policy.
- Support for innovation.
- Housing.
- Planning\(^{(1)}\) (apart from the energy consents listed below).
- Power station consents (at or below 50 MW).
- Offshore renewables handled under the Transport and Works Act.
- Local commercial pipelines.
- Gas storage handled under the planning regime.
- LNG terminals handled under the planning regime.

**NOT DEVOLVED/TRANSFERRED**

- Promotion of renewable energy\(^{(2)}\).
- Promotion of energy efficiency\(^{(1)}\).
- Building Regulations.
- Power station consents (over 50 MW)\(^{(3)}\).
- Offshore renewables handled under the Electricity Act.
- Overhead electricity lines.
- Gas transporter pipeline clearances.
- Cross country commercial pipelines.

Notes

\(^{(1)}\) The National Assembly for Wales controls the budget and/or funds certain energy efficiency schemes in Wales, eg the Home Energy Efficiency Scheme, the Energy Efficiency Best Practice Programme, and part of the activities of the Carbon Trust Wales.

\(^{(2)}\) Although future policy and funding of renewables is a reserved matter, planning matters have been devolved. Assembly has therefore produced TAN 8, its strategic planning guidance on the location of new on-shore wind farms in Wales.

\(^{(3)}\) Assembly’s request for the transfer of energy consent powers for power stations over 50 MW is currently being considered by the Tri-partite Working Group of officials from the Wales Office, Dti and the Assembly.
**Witnesses:** Mr David Wagstaff, Director, Energy Strategy Development and Delivery, Mr Richard Abel, Director, Domestic Energy, Mr Gary Shanahan, Assistant Director, Bioenergy and Marine Renewables, Ms Cathy Allen, Assistant Director, Consents Policy and Delivery, Mr Brian Morris, Assistant Director, Carbon Abatement Technologies, and Ms Ruth Henrywood, Assistant Director Energy Review, Department of Trade and Industry, gave evidence.

**Q1 Chairman:** Good morning. Welcome to the Welsh Affairs Committee. Would you please begin by introducing yourselves.

**Mr Wagstaff:** I am David Wagstaff. Director of Energy Strategy Development and Delivery is my full title, which basically means overall strategic direction for the Department of Trade and Industry on energy policy and also the Climate Change Programme Review.

**Mr Abel:** I am Richard Abel. I am the Director of Domestic Energy Policy in the Energy Markets Unit in DTI, responsible for security of supply and the regulatory framework for gas and electricity.

**Mr Shanahan:** Good morning. I am Gary Shanahan from DTI’s Emerging Energy Technologies Unit, responsible for biomass and marine renewable programmes and policy.

**Ms Henrywood:** I am Ruth Henrywood and I lead the nuclear workstream within the Energy Review.

**Ms Allen:** I am Cathy Allen from the Electricity Development Consents Team within DTI. We consider applications for electricity infrastructure, such as power stations.

**Mr Morris:** I am Brian Morris, also from DTI. I am the Head of the Carbon Abatement Technologies Unit, which includes technologies such as clean coal technology, and I am responsible for overseeing the development of those technologies.

**Q2 Chairman:** Thank you very much. I will begin by referring to the Government energy policy. It is aiming to cut carbon dioxide emissions by 60% by 2050, with real progress by 2020. I notice this is a matter of great controversy at the moment in the Government. I see that there is an article on the front page of the Guardian today. Will that be measured at a UK level or will it be assessed at a regional level?

**Mr Wagstaff:** The target is set at a UK level. Obviously, as you say, it is a Government target, not just a Department of Trade and Industry target, so it is shared by all of government. Of course each region and area in the UK will be expected to contribute, but there is not an allocation by region, it is a UK target.

**Q3 Chairman:** There would not be an internal market, so to speak, between the regions competing with each other.

**Mr Wagstaff:** The Carbon Trust has suggested, for example, that there could be a UK trading scheme, but of course there is already an EU trading scheme, so there is not at the moment any plan to have that kind of internal market you have just mentioned. As you will be aware, however, the whole issue of the target for carbon emissions is being looked at under the Climate Change Programme Review. Indeed, the article to which you have referred mentions the fact that the findings have not yet been published, so, until the findings are published, it is difficult to say what exactly will be in that document.

**Q4 Jessica Morden:** The topography of Wales makes it highly suitable to exploit sustainable energy production. How does Wales fit into the UK Government’s plans for greener energy production?

**Mr Shanahan:** Wales has an abundance of natural resources in terms of green energy. There are a number of ways in which Wales can contribute to the renewable development targets which the Government has put in place (for example, 10% of renewable electricity by 2010 and the aspiration to double that by 2020), and the Welsh Assembly has also been developing its strategy for energy and renewables which the Government has committed is a UK-wide target but of course there is already an EU trading scheme, so there is not at the moment any plan to have that kind of internal market you have just mentioned. As you will be aware, however, the whole issue of the target for carbon emissions is being looked at under the Climate Change Programme Review. Indeed, the article to which you have referred mentions the fact that the findings have not yet been published, so, until the findings are published, it is difficult to say what exactly will be in that document.

**Q5 Jessica Morden:** You have mentioned that the Welsh Assembly Government has its own route-map for future energy production. Do you feel it dovetails into the UK Government’s plans? If there is a difference in direction, which route do you take and who decides?

**Mr Shanahan:** The route-map is out for consultation at the moment, so I guess we need to see the results of that consultation before we can say how it might dovetail into the UK policy.

**Q6 Jessica Morden:** Who would make the final decision if there were a difference?

**Mr Shanahan:** I am not sure. Certainly the Welsh Assembly will be setting their own strategy. The Sustainable Energy Policy Network and the meetings of ministers that look at the whole piece of sustainable energy policy would consider if there were any differences between the Welsh policy and the UK policy.

**Ms Allen:** If I may give you the statistics on the renewable energy side: the UK 10% target equates to 33.6 TWh per annum and the Welsh Assembly Government has a target of 4 TWh per annum of renewable energy production by 2010 and 7 TWh by 2020. The Welsh Assembly Government target fits underneath, as it were, the UK Government target. The Welsh Assembly Government target is about 12% of the UK Government target.

**Q7 Hywel Williams:** Could I go back to the very first question on carbon dioxide emissions—perhaps I did not understand or did not hear. Are the targets set for Wales separately from the UK?

**Mr Wagstaff:** We have just been talking about the Welsh Assembly Government target, but the target to which the Government has committed is a UK-wide target and it does not specify what contribution needs to be made by which parts of the UK to meet that target. It is quite difficult to measure carbon emissions and you will be aware that there is quite a lot of dispute about how you measure the baselines. If you tried to do that broken down into lots of
regions, you would probably complicate the measurement task even more. As far as the UK Government is concerned, it is a UK-wide target.

**Q8 Hywel Williams:** Turning to the export of energy from Wales, North Wales exports energy and South Wales imports energy at a much higher price. Can this imbalance be rectified at an all-Wales level or could that be reflected in a UK Government energy policy?

**Mr Wagstaff:** Could you explain the problem that needs to be rectified.

**Q9 Hywel Williams:** Should it not be just on a North Wales basis or should it be a matter for the UK Government energy policy?

**Mr Wagstaff:** I am sorry, the market is functioning. What is the failure that you are wanting the Government to address?

**Q10 Hywel Williams:** It is not a failure. It is clear that North Wales produces more electricity than is used in North Wales. South Wales produces less electricity than is used in South Wales, and the price is much higher. In fact, South Wales apparently pays the highest price for electricity possibly in the UK. Is there any scope for looking at this on an all-Wales basis, given that North Wales produces a lot and South Wales produces not a lot? Presumably there are transmission costs involved, but is there any mileage in looking at this question on an all-Wales basis?

**Mr Abel:** We recently connected up the electricity market across GB, including Scotland joining up with the England and Wales system. It is clear that the location of generating capacity close to population centres is not always evenly distributed across GB. The market mechanisms that Ofgem have developed around transmission charging, which are regularly considered, try to reflect that. But domestic and industrial consumers obviously have scope to shop around for the best deal and I do not think that is normally—except perhaps with some very large consumers—completely constrained by geography. There are usually options of different suppliers in different areas.

**Q11 Hywel Williams:** We do have some very large consumers, in terms of heavy industry, in Wales. Are the price differentials significant for these large users of electricity; for example, the heavy industry in South Wales?

**Mr Abel:** I am not personally aware of it having been raised as a problem between North and South Wales. Obviously, prices are of concern to large industrial users, particularly at present, but I was not aware of that as a particular issue. But we will look into that and see if we have had any representations.

**Q12 Hywel Williams:** Looking at Wales as a whole as a net exporter of energy, are there any tangible advantages for Wales of being a net exporter?

**Mr Abel:** I suppose it would be true to say that if one has the generation within one’s area there is a certain amount of economic activity—not huge—associated with that in terms of jobs. For individual consumers, there are issues about connecting to, say, gas—rarely to electricity—and there can be a difference between rural and urban environments. That is not peculiar to Wales; it is obviously a feature of Scotland and indeed some parts of England. From our perspective, particularly given that there is a grid going across the whole of the UK, issues are primarily around the UK becoming a net importer of energy—and already moving into that position in gas, which raises particular issues—rather than broken down into particular geographic parts of the grid.

**Q13 Hywel Williams:** If the electricity generation industry in Wales were developed, at perhaps some cost to the environment of Wales, that electricity would not be used in Wales but rather exported, and you cannot point to any tangible benefits for Wales because that would be considered on a UK basis.

**Mr Abel:** Clearly there are costs and benefits in any individual infrastructure decision around an energy product. I guess the advantage is not one that is peculiar to Wales but one that is for the UK as a whole, in the sense that if for inward investment by companies the UK is seen as a place where there are secure, reliable energy supplies, and, looking in the long-term, as a market that delivers competitive prices and there is security of supply, that has to be good thing for Wales as well as the rest of the UK.

**Q14 Hywel Williams:** But not directly.

**Mr Abel:** No, that is an indirect benefit, I agree.

**Q15 Hywel Williams:** I know that the UK is an importer of electricity. Is that the case at the moment?

**Mr Abel:** We do import electricity via the interconnector from France. We are not a net importer of electricity—there is a generating margin—but there is that connector there and, by and large, particularly in the winter, it produces and sends electricity into the UK market.

**Q16 Hywel Williams:** I wonder, as a matter of information, how that electricity, when it is imported, is divided up between renewable and non-renewable sources.

**Mr Abel:** I could not answer that question directly, but, if you look at the generation mix in France, from where it is coming, clearly there is a large nuclear component to that.

**Q17 Hywel Williams:** The 14% in 2000—if I am reading these figures properly from your brief—would that be classified as renewable because it came in from France largely from nuclear production?

**Mr Abel:** I think that is probably a wider question. I do not know the answer as to whether one would classify that as renewable. I know there have been discussions, and this has come up in the House,
about whether nuclear energy is classed as renewable or not, and I do not think it would be good for me to go into that now.

**Mr Shanahan:** Certainly, in terms of the EU Renewables Directive, nuclear would not be classified as renewable.

**Mr Wagstaff:** And it does not count under the renewables obligation.

**Hywel Williams:** Thank you.

**Q18 Mr Jones:** You have touched on the point I was about to raise as to whether, as a matter of information, nuclear energy was categorised as a renewable source. Having regard to the fact, so far as I know, that it does not produce significant quantities of greenhouse gases, do we know why it is not classed as a renewable source of energy?

**Mr Shanahan:** We classify our renewables in line with the EU Renewables Directive and that does not define nuclear as a renewable source.

**Q19 Mr Jones:** I understand that but I was wondering if you knew why the Directive did not class nuclear as a renewable source of energy.

**Mr Shanahan:** No, but I can clarify that in writing, if that would be helpful.

**Q20 Mark Williams:** I am now turning to the issue of the division between reserved and devolved powers to the National Assembly. We touched on this earlier. You have stated that the Welsh Assembly is consulted on all consent applications in Wales. I would like to know a bit more about the mechanisms by which that consultation works, and, in particular, how the National Assembly’s objections would be taken into consideration.

**Ms Allen:** On consent applications where the proposed generating capacity is in Wales but it is the Department of Trade and Industry which is taking the decision, we would write to the Welsh Assembly Government and ask them if they would wish to put forward their views on a particular proposal. That would then be taken into account when the minister was coming to make his decision.

**Q21 Mark Williams:** A couple of years ago our predecessor Committee was told by Jacqui Smith (the then Minister of State in your Department) that the tripartite group considering energy consents would report to the minister by the end of the year 2004. We are now in 2006 and we have yet to have the report. I would be interested to know, firstly, why it has taken so long. Why have we still not had that report and what have been the problems behind the arrival of that report?

**Ms Allen:** I very much agree that it has taken much longer than expected to carry out the work of the tripartite group. The issues are rather complex, and we did not want to come to a rushed decision, so that is why it has taken longer than expected. We hope that the work of the group will be finalised as soon as possible.

**Q22 Mark Williams:** Could you elaborate a bit more on the problems you are trying to overcome?

**Ms Allen:** It is a difficult decision because you have to balance national energy policy against local democracy, I suppose, and that is not an easy decision to have to take.

**Q23 Mark Williams:** Can we assume some of the problems therefore are between the National Assembly and the Department in London?

**Ms Allen:** It is obvious that the National Assembly would wish to see consents going to the Welsh Assembly Government because that is the basis of their request to the Wales Office and to DTI, so it is a question of working through all those issues.

**Q24 Mark Williams:** DTI’s objections to the National Assembly request are . . . ?

**Ms Allen:** As I say, it is an issue about balancing how you have a national energy policy which is required to keep the lights on, against giving local democracy to areas where the actual generating station is going to be located.

**Q25 Mark Williams:** Clearly you sincerely hope the conclusions are reached sooner rather than later, but when would you envisage decisions being made, given that we have now waited coming up for two years?

**Ms Allen:** Yes. I am afraid I cannot give you a definitive answer on that, because we are now into a situation where we have an energy review and I think that has a bearing on the issues, but we would hope some time later this year.

**Q26 Mark Williams:** Again, you have touched on this, the dilemma, if you like, between local democracy and wider energy policy, but could you go into a bit more depth on the impact upon UK strategies for energy production were energy consents devolved to the National Assembly. What would the impact be at the UK level were that to happen, as some people have suggested, not least the National Assembly?

**Ms Allen:** I am not entirely sure. I cannot give you the figures because it would depend on the number of power station proposals which were coming forward in Wales as to the contribution they would make to the overall energy situation.

**Q27 Mark Williams:** If we talk in very general terms, the Department would see the National Assembly’s request as a negative. You have said that you would like to seek a balance, a consensus, between the three bodies involved, but the Department would see the National Assembly’s request as more of a negative than a positive if we look solely in terms of energy production nationally.

**Ms Allen:** I am not saying that. I am saying it is an issue that needs to be looked at very carefully and the tripartite working group has not yet made a final decision on that.

**Mark Williams:** Thank you very much.
Q28 Mr Jones: You have mentioned the energy review, and it is clear, at least from the noises the Prime Minister has been making, that the Government is considering now the development of a new generation of nuclear power stations. At the same time, of course, the Welsh Assembly has set its face against the development of nuclear power stations; although again we have recently heard noises from their economic development minister that he may be softening his stance on the matter. If the UK Government did decide to go down the nuclear route but the Welsh Assembly maintained its opposition to nuclear power stations in Wales, how could this difference of approach be managed between the two administrations?

Mr Wagstaff: I will hand over to my colleague in a moment, but could I first say that I do now have an answer to your previous question about the renewable categorisation of nuclear. It boils down to the fact that it is a finite source of fuel. Although it shares the environmental benefits of renewable energy in that it does not emit carbon dioxide at the point of generation, because it is a finite fuel source it is not renewable in the dictionary definition.

Q29 Mr Jones: Pausing briefly there, before you answer the question I just asked, that being the case, is there not an argument for categorising nuclear power separately from fossil fuels on the one hand and, if you like, traditional renewable sources on the other?

Mr Wagstaff: Yes. We will get on to what the Energy Review is looking at in a moment, but, certainly on that particular point, the Government is examining options to promote low carbon generation. They are not constrained by a definition of renewable; they are looking at, as one of the four key objectives, low carbon generation—but of course balancing it against the other objectives which are security of supply, competitive markets and addressing fuel poverty issues. On the question of the review and nuclear, perhaps I could ask my colleague to say something.

Ms Henrywood: It is important to stress that no decisions have been made either way on whether the Government should go for new nuclear or not. It is one aspect of a much wider energy review, as David was saying, looking at low carbon generation technologies. In terms of consents, if there were to be any proposals for new nuclear build they would have to go through the section 36 planning application, so, as we were saying earlier, under the regime now that decision would be made by the Secretary of State rather than the Assembly and rather than Parliament, it would be the Secretary of State who would decide.

Ms Allen: Could I supplement that by delving a little bit into the section 36 consents process. If the nuclear power station were proposed for somewhere in Wales and the local planning authority objected to that development, then the Secretary of State would be obliged to hold a public inquiry into that proposal under the statutory section 36 scheme.

Q31 Mr Jones: But the ultimate decision would reside with the Secretary of State.

Ms Allen: Indeed, yes.

Q32 Mr Jones: Would it be possible for the UK to pursue a nuclear policy but not to build nuclear power stations in Wales? Is it possible that that is a course that the DTI might take, to exclude Wales from the next generation of nuclear power stations?

Ms Henrywood: I think it would depend where the proposals came from. If the review concluded that there was a future for new nuclear, we would be looking for the private sector to come up with proposals for where any new build should be sited, so we cannot pre-judge where that would be at this stage.

Mr Wagstaff: Clearly there are at least two options. One option would be to build on new sites and another option would be to build on existing sites. But, beyond that, given that the document itself was only published last week, it is a bit premature to start speculating about where there might be some nuclear power stations if the decision were taken to encourage the private sector to build them. The answer to your question is: yes, it is possible, but that is not a policy that I have heard anyone talk about.

Q33 Mr Jones: You mention existing sites and there is one very obvious existing site in Wales.

Mr Wagstaff: Indeed.

Q34 Mr Jones: If you like, the other side of the coin, is it therefore the case that the National Assembly’s ambitions to pursue a nuclear-free Wales policy would very likely be frustrated by the DTI, if the DTI decided it wanted to grant consents to nuclear power stations in Wales?

Mr Wagstaff: It would be the Government that makes the decision, not just the DTI. Ultimately, energy policy at that level has not been devolved, so it remains with Whitehall to take those decisions.

Q35 Mr Jones: The answer is: yes, the National Assembly’s ambitions could well be frustrated.

Mr Wagstaff: As we have just heard, the National Assembly does not make the ultimate decision, so, yes.

Q36 David Davies: Could I take you back to tangential points. On this issue of whether nuclear energy is a finite resource, it relies I think on the use of uranium. I have heard figures about the reserves of uranium. Some people have said it is likely to run
out in ten years and other people on the other side of the argument have said that so little of it is used that it is pretty well finite. I have heard those two conflicting views put to me and I wonder which is more accurate.

**Mr Wagstaff:** It is certainly not infinite in the sense that solar or wind is. I think that is really the definition you are getting at. It relies on an input that has to be got out of the ground. On the science, I have read many articles, and I am sure you have, about oil, gas and all the other reserves as well. It is very hard to get any consensus on how much of any of these things there is left. I should also point out that I know one of the reasons we specify there is low carbon emission at the point of production is that there are of course debates about the amount of carbon emitted in getting the uranium out of the ground and getting it into this country—because of course we do not have uranium in this country.

**Q37 David Davies:** Although, of course, that would apply to coal, gas or virtually anything, so in some senses that is not a fair argument against nuclear.

**Mr Wagstaff:** No. I am sorry, I was not trying to make an argument against nuclear; I was trying to explain why the matter of carbon emissions is quite a complicated one.

**Q38 David Davies:** With oil and gas, which you have mentioned, I have heard figures of between 50 and 200 years, but it is likely to run out within the next 200 years. Everyone seems to be agreed on that. Someone from the Green lobby put to me that uranium could run out within ten years, to which my answer was that there would not be any point in building a nuclear power station because it would take ten years to get it through. Is that realistic or is the nuclear industry view that it is pretty infinite because so little is used. Is that the more accurate view or is it somewhere in between?

**Mr Wagstaff:** I would be speculating.

**Ms Henrywood:** I know there is an OECD study which estimates that there would be enough uranium for new nuclear build across the globe—because obviously it is not just the UK that is considering this issue. I think there is also a question of the quality of the uranium. I think there is lots there but of varying quality.

**Q39 David Davies:** Enough for how many years? Did the OECD say?

**Ms Henrywood:** I do not know the exact number. I would say that as part of the work we are doing on the Energy Review we are looking at the availability of uranium in the context of analysing the costs and the benefits of whether new nuclear is viable.

**Q40 David Davies:** It seems to me that this is a crucial point, and, with respect, nobody here seems to be able to supply a definitive answer. I know there is no definitive answer—

**Ms Henrywood:** I would say that that is something we are looking at in the review which is ongoing, so it would be premature for me to speculate on that.

**Q41 David Davies:** Would it be practical or even possible for the Welsh Assembly, if it does name the argument has said that so little of it is used that it is pretty well finite. I have heard those two conflicting views put to me and I wonder which is more accurate.

**Mr Wagstaff:** I think the schemes to which you refer are primarily for individual consumers. Leaving aside the nuclear question of the different source of fuels, some companies do offer things like that now, and perhaps they might in the future. Whether it could be done on a national basis, I cannot really see how that would work because it is going to be individual consumers who are choosing which supplier to get their electricity from.

**Mr Wagstaff:** I do not think you could have a competitive market, which is one of the four fundamental goals of energy policy, if you were constraining the population in that way.

**Q42 Hywel Williams:** Could I take you back to the question of uranium supply. Of the uranium that we know is available, how much of that percentage is located in politically stable, safe countries?

**Ms Henrywood:** We get most of our uranium for the current generation of nuclear from Australia and Canada. There are uranium reserves in less politically stable countries, but most of it comes from Australia and Canada. I think it is about 30% but I am not sure if that is accurate.

**Q43 Hywel Williams:** That supply is finite. Do you have any idea as to how long it will last?

**Ms Henrywood:** The information I have here is that the known recoverable uranium reserves should last about 50 years.

**Q44 David Davies:** Is that known recoverable in Australia and Canada and stable places or across the whole globe? Is that based on the amount we currently use or projected amounts if China and other places—

**Ms Henrywood:** I do not know. I am afraid.

**Mr Wagstaff:** We do not know. It should be pointed out that when you are working on a 50-year time scale we do not know which countries are going to be stable and which countries are not going to be stable.

**Q45 Hywel Williams:** Could I clear up one other point which is troubling me based on something you said earlier on. Is it the Government’s target to increase energy production from low carbon at the point of production facilities, or is it also or otherwise to increase production from renewables? Which are you aiming for? Do you want more electricity production from renewables and from low carbon such as nuclear? Is this an either or?
Mr Shanahan: There are definitive renewables targets that set what the Government expects to come from renewable sources; that is, 10% by 2020 with an aspiration to double that by 2020. But in terms of the impact of other lower carbon sources of energy, they fit into the wider Climate Change Programme targets. That is the difference. Both need to contribute towards the wider Climate Change Programme targets.

Q46 David Davies: Without going into the benefits or otherwise of nuclear power, could you tell us what the practicalities or practical problems would be of extending the nuclear power station at Wylfa? Mr Wagstaff: I do not think I can tell you what the practical problems are, but I am sure we could write to you on the point.

Q47 David Davies: Is it a fairly easy engineering process to extend the life of a nuclear power station? Is it something that is fairly straightforward, or does it involve huge amounts of rebuilding? Mr Wagstaff: It depends which type of nuclear power station it is and it depends obviously on how near to the end of its life it is. But I am afraid I do not have the technical expertise to answer that question.

Q48 David Davies: From the memorandum which you have supplied to us, powers of commercial gas storage appear to be split between the UK and the Welsh Assembly Government. Could you tell us how that works in practice, and, in particular, with regard to the facilities in Pembrokeshire. Mr Abel: In relation to the Milford Haven import project.

Q49 David Davies: Yes. Mr Abel: The pipeline connecting the import facilities which are planned in Pembrokeshire is a matter that the DTI considers the consent for, as the National Grid is exempted as a gas transporter from planning permission regulations and so that is done separately. The Welsh Assembly Government has a role in relation to the facilities on land in terms of the import facilities and also the planning permission that applies to gas storage facilities on land in general, whether at Pembrokeshire or indeed elsewhere.

Q50 David Davies: Who has the planning permission over pipelines, such as the one that might go through the National Park? Mr Abel: DTI. Ms Allen: We look at the environmental impact assessment aspect. As Richard has said, because it is a licensed gas transporter, they have—I forget what the phrase is—something like "permitted development rights" so far as the pipeline is concerned, but the Secretary of State looks at the environmental impact of the development.

Q51 David Davies: Just out of interest, would the DTI have similar planning powers over similar issues in Scotland? Mr Abel: I will confirm this but I believe that because National Grid’s exemption is by virtue of it being a gas transporter, similar considerations apply in Scotland. But I will confirm that, if I may, after this session.

Q52 David Davies: Without wanting to go back over anything else, in terms of power stations, does the DTI have similar planning powers overall in Wales as they do in Scotland? Or does Scotland have more devolved powers over planning issues? Mr Abel: There is a difference there, I think. Ms Allen: That is right, there is a difference. In Scotland section 36 consent powers have been devolved since 1999, shortly after the Scotland Act.

Q53 Mark Williams: I think you have already answered one of my questions in regard to Milford Haven, but how will the project there tie in with UK strategy generally on the use of gas? Mr Abel: The two import facilities there are very important, looking forward, for the overall security of gas supplies for the whole of the national transmission system in Great Britain, because, when they are up and running, on present plans they will have the import capacity to supply about 20% of UK demand averaged out over a year. That is obviously very significant. It is important, because, as I mentioned earlier, the UK became in 2004 a net importer of gas. Along with storage facilities to deal with (the fact that we use a lot more gas in winter than we do in the summer), the ability to import the gas is very important. The Milford Haven projects are an extremely valuable contribution to that. Mr Wagstaff: Would it be helpful if I said a bit more on Wylfa? I do have some information here. The Nuclear Decommissioning Agency is due to publish its strategy this spring and it is the NDA which has responsibility for nuclear clear-up. We understand that they will cover this issue of Magnox in that strategy, so there may be some more that will be available within the next few months.

Q54 Mrs James: I am particularly interested in clean coal technology and I believe the Government has already allocated over £500 million—a significant amount of money—to the emerging renewable and low carbon technologies. Do you know how much of this money is going towards clean coal technology? Mr Morris: I am not too sure where that £500 million has come from.

Q55 Mrs James: From between about 2002 and 2008, if you add it all up. Mr Morris: Let me tell you what we have allocated for developing clean coal technologies and clear fossil technologies. Since 1999 we have allocated about £13.5 million on about 45 R&D projects, and that money has been spent over that period of time in the R&D work. Under the new technology strategy arrangements within the DTI, we have a share of some £20 million which can be allocated to some sustainable fossil technologies. At the moment there is a call going on for proposals for R&D
projects and there are proposals in there which are being assessed. That is what we have been doing on R&D into clean fossil technologies. We also have some work we are doing with the Americans. About £3.5 million is going into that from the British side and that is looking at materials for more efficient power plant and also at a virtual demonstration plant, which is really trying to simulate a power plant in a computer system to make it easier to try to identify if a particular plant would work better in certain circumstances than in others. That is the sort of money we are putting into domestic R&D and money we are putting into some collaborative work. We have recently signed an agreement with the Chinese for some further research and development with them and we are due to have some meetings with them in April to decide how we are going to spend that money. The other element of the work is the money announced by the Chancellor back in the Budget in April last year. That was £25 million for a demonstration plant and then he announced a further £10 million in November, making it up to £35 million. At the moment we are going through the process of setting up a scheme to spend that money on a demonstration project, which quite likely will be something to do with clean coal technology as opposed to other fossil fuels, but it is very early days in that yet. We are still getting state aid clearance and we are still getting the scheme together. We were hoping for proposals to come through early in the spring. We would like to assess a project that would be worth pursuing and worth supporting.

**Q58 Mrs James:** I think it is a fundamental question. **Mr Morris:** In June Malcolm Wicks announced a carbon abatement technology strategy which sees how we should be developing these technologies over the next 20 or so years. That was announced in June. In fact he was also at that time able to announce the £25 million that we have been given by the Treasury. That sets our framework in developing clean fossil technologies up to 2020 and just beyond. The aim is really working through more efficient technologies—using the coal more efficiently, therefore less emissions—biomass through to carbon capture storage, where there is huge potential for large cuts in carbon emissions. But the strategy should be in the library. I can arrange copies for you.

**Q59 Mr Jones:** You just mentioned carbon capture, which is an area that fascinates me. Could you tell me a bit more about carbon capture and what is done with the carbon once captured. Do they remain there or are they processed?

**Mr Morris:** The idea of carbon capture storage is on a demonstration project, which quite likely is worth pursuing and worth supporting. Of course, there were a number of ideas on where you can put it. The depleted oil and gas fields in the North Sea are potential sites for disposal of the carbon dioxide. The aquifers, provided they are the right sort of aquifer—and you have to be very careful here because you cannot just stick it into any old aquifer; you have to get the right sort of aquifer with the right sort of cap lock above it, so it is stored and trapped underground. Once you have filled up that aquifer, you can seal it, and the theory is that it will stay down there for millennia. There are examples of it being done throughout the world now. Sleipner, the project in the Norwegian sector of the North Sea, has been going for just over nine years. They have been injecting carbon dioxide into an aquifer just above the gas field that they have been exploiting and it appears to be behaving itself and staying down there. We want to store this stuff away for basically hundreds of thousands of years, so nine years is nothing really, but the evidence suggests that it does appear to be working. There are other projects around the world, particularly in the United States and Canada, where they are storing carbon dioxide. In North America they are usually doing it to get more oil out of the oil wells. It is a very good for getting more oil out. But that is the idea, and of course one of the big issues is about managing that process properly so that it does not leak out again. That is one of the sensitive issues about the whole concept of carbon capture and storage.

**Q56 Mrs James:** You have obviously talked about the assessments that are ongoing. Have you made any assessments of the potential to exploit coal technology in Wales? Do you have any time frames or any idea of any work that is going on in Wales?

**Mr Morris:** We are aware of activity in Wales. I know there was a proposal for a carbon capture storage project in South Wales. It has not made any real progress beyond the idea stage. A company called Progressive Energy had ideas about a particular project like that which would involve injecting carbon dioxide into an aquifer in the St George's Channel, but it has not gone beyond the ideas stage. With all these projects, Wales and England and Scotland are all taken as one. Proposals can come from any of the three countries—well, four countries, including Northern Ireland—for projects which would be eligible for that support. But at the moment we do not distinguish between Wales, Scotland or England for allocating those grants.

**Q57 Mrs James:** The message, if you have ideas, is to come to you.

**Mr Morris:** Yes.

**Mr Wagstaff:** In the longer term, it might be worth mentioning the Energy Review will be very much focusing on the whole clean coal technology and carbon abatement technology as part of looking at potential technologies. That is looking longer term.
Chairman: We will be taking evidence from Tower Colliery in March, we hope. We are aware that the DTI has assisted Tower Colliery to the tune of something like £3 million to “maintain access to remaining reserves”. We are also aware, confirmed last week, that Tower Colliery will be closing in about two years time. What investment is being provided to develop new technology to access the 250 million tonnes of coal that remains in Wales today?

Mr Morris: The coal mining industry is not my area of competence, to be honest with you. I concur with your statement that Tower is meant to be shutting in 2008, and I understand it is shutting because it would have been exhausted by that time. I also understand there are other projects afoot to look at the potential for new coal fields in South Wales. I think there is another operating mine which is quite small and there is a potential project—but I am not sure whether that is just looking at the opportunities rather than anything being seen as a commercial concern at this stage. But this more information that I have picked up second-hand rather than being involved in it directly myself. If you wish me to find out more about it, I can go back to my colleague who is responsible for the coal mining industry and ask her for confirmation and then I can write to you later.

Chairman: You would not be able to give us any figures on the financial support you are providing for such projects.

Mr Morris: I will not be able to give you the financial information. I can ask a colleague to provide that information and send it to you.

Chairman: Tower Colliery is particularly concerned about one very scarce commodity; namely skilled labour. We are fast running out of skilled miners. Within less than a decade it is likely that we will not have any left. There is a degree of urgency about the situation in South Wales. Do you have any observations on that?

Mr Morris: Like a lot of UK mines, all the mines have been gradually shrinking. All I can say is there is a possibility of this other project which obviously could be hopeful. But we are becoming more and more dependent on imported coal nowadays throughout the United Kingdom. About half our coal now is imported, compared to domestically produced coal. I know Aberthaw takes most of its coal from Tower at the moment. When that dries up, I suspect it will be importing coal, unless the other projects start to show opportunities for fresh supplies of coal.

Chairman: Cornish has recently had the licence for the possible Margam new mine—and you may have been alluding to that.

Mr Morris: Yes.

Chairman: Would they be able to access any development funding or any time of finance?
31 January 2006 Mr David Wagstaff, Mr Richard Abel, Mr Gary Shanahan, Ms Cathy Allen, Mr Brian Morris and Ms Ruth Henrywood

our second round. As you know, the Gwynt y Môr proposal is currently with the Secretary of State for eventual decision.

Q68 Mark Williams: Notwithstanding what you have said—and I appreciate the responsibility of the Department on those off-shore sites—for on-shore sites more generally—and I appreciate that there is one in my constituency in Cefn Croes, a very controversial scheme that provoked a great deal of anxiety locally—you would appreciate that there is a perception within Wales that in parts of Wales there is an over-saturation issue there. 

Ms Allen: On-shore the situation is different in that it is entirely up to the developers where they choose to plan their wind farms, so we are in a sort of reactive mode. We deal with the section 36 applications for the larger wind farms when they come forward to us. So it is a matter of where the developer things the best wind resource is.

Q69 Mark Williams: You supplied us with some very useful figures on the size of, more generally, power stations within Wales and their capacity. Have there been any particular problems in the Department in providing figures on individual wind farms? I only pose that from personal experiences, having tried to ascertain the capacity of Cefn Croes, put parliamentary questions, a letter to the minister and follow-up letters to Ofgem, there seems to be a reluctance to provide some of the figures. That may not be the case, perhaps we can liaise on this through letters. Have there been any particular problems in getting individual onshore wind farms generation capacity figures?

Ms Allen: There is a slight difficulty in that the DTI only consents under section 36 generating stations which are above 50 megawatts which was the case in Cefn Croes. For those wind farms I would not have thought there is any problem at all with giving figures on the generating capacity. Where a generating station is 50 megawatts and below, the DTI does not have a role at all, it is played entirely by the local planning authorities. There we are slightly more removed from the process and we might have more difficulty in having data at our fingertips. As I said, the British Wind Energy Association tries to bring all of this information together on its website.

Q70 Mark Williams: You are right to highlight that I was specifically referring to Cefn Croes, mercifully now I have the figures. I just make the point it has taken a long time to get those figures and of course our public information should be available.

Ms Allen: There may be an issue about the difference between what the generating capacity of the wind farm is and what it produces which will be different, or can be different.

Mark Williams: Thank you. I think you have answered my next question which was in terms of the responsibility for wind farms between the National Assembly and the UK level, the dividing point is, the reserve power and the over 50 megawatts issues.

Q71 Mr Jones: If I could come back to the figures which you have just provided us with. You have indicated the percentages of wind energy that originates in Wales. It does seem to me that if you look at these figures on a per capita basis, Wales has got vastly more exposure to wind farms than the rest of the country. Is that fair to say?

Ms Allen: My perception is that in terms of wind farm developments, the place that is most attractive is Scotland rather than Wales but I do not have the figures for Scotland in front of me at the moment.

Q72 Mr Jones: Certainly, on an England and Wales basis, it seems to me that Wales is producing a lot more wind energy than England and Wales combined, is that correct, on a per capita basis?

Ms Allen: I do not have figures on that. I am sorry.

Q73 Mr Jones: It must be the case on the basis of the figures which you have given us. You indicated also that so far as onshore wind farms are concerned, it is up to the developers to decide where to develop the wind farms. Is that strictly correct having regard to TAN 8, which of course does set out a number of Strategic Search Areas in which wind farm development is positively encouraged? Whilst taking your point, is it not the case that the developers have to operate withintheframeworkofTAN8?

Ms Allen: I was looking at it from a UK Government perspective. TAN 8 is planning guidance which has been issued by the Welsh Assembly Government to give a steer to developers as to where we would like them to focus their projects.

Q74 Mr Jones: To that extent, an onshore wind farm developer, who wanted to put up wind farms in Wales, would work within the framework of TAN 8?

Ms Allen: That is my understanding, yes.

Q75 Mr Jones: If the UK Government has responsibility for policy and funding of renewables, including wind farms, how does that tie in with TAN 8 and the National Assembly’s ability to control the planning aspects of wind farms?

Ms Allen: Sorry, can you say that again?

Q76 Mr Jones: Yes. If the overall policy, in terms of wind farms and renewable energy generally resides still with the DTI how does that tie in with the National Assembly’s desire and ability to control the development of wind farms in Wales through a policy document such as TAN 8?

Ms Allen: I think the issue is that the UK Government has reserved powers in relation to energy and energy policy, but that planning is a devolved issue.

Mr Wagstaff: This is really a question about investment, is it not?. The UK Government is trying to facilitate investment in various different energies through various different instruments, some of which is direct grant and some of which is economic instruments or tax instruments under renewables obligations. There are lots of different ways of doing
that and the review is looking at all of that. The fact that the Government is facilitating investment in something does not necessarily contradict the fact that locally, or regionally, or in Wales as a whole, there is planning control over where that investment is allowed to be made.

**Q77 Mr Jones:** Yes, but really TAN 8 goes beyond that, does it not? You talk in terms of planning but, of course, the consents that are granted for large scale wind farms are things that are not governed by the normal planning process because one makes an application under 36, as I understand it, directly to the DTI. What I find paradoxical is that on the one hand the National Assembly has set out the framework for onshore wind farm development through documents such as TAN 8, which are planning documents, nevertheless the decision as to whether and where these wind farms are developed still resides with the DTI so far as the large scale ones are concerned because of the fact that these are reserved powers. What I am finding interesting is to see whether there is any sort of liaison or, if you like, dovetailing of the two roles here.

**Mr Shanahan:** That is similar if one looks in England. Each of the English regions have regional planning guidance which inform the local planning authorities in their decisions on the consent process but, again, English regions fit into the national framework in the way projects come forward.

**Q78 Mr Jones:** I understand that also but, as I say, the problem is that this is not strictly a planning matter, this is a matter of consents for large scale wind farms which is a strategic matter which is reserved to the DTI. What I would also like to know is to what extent is there co-ordination between the UK Government on the one hand and the Assembly on the other with regard to the development of wind farms and the policies that are adopted in connection with the development of wind farms?

**Mr Wagstaff:** I am afraid I do not know how the TAN 8 guidance was drawn up.

**Ms Allen:** It was drawn up by the Welsh Assembly Government which consulted on it quite widely. We do have regular contact with the Welsh Assembly Government officials.

**Q79 Mr Jones:** Was there input from the DTI into the process which led to the development of TAN 8 in Wales?

**Ms Allen:** I am not sure whether we contributed to the consultation on TAN 8 or not, I do not know. I would make the point that as we have seen from the statistics in fact the DTI has only consented one large wind farm in Wales which is Cein Croes. It has been the case that there have been a lot of small wind farms below 50 megawatts.

**Q80 Mr Jones:** That is right but TAN 8 does have the Strategic Search Areas which earmarks locations for large scale wind farm developments above 50 megawatts. On that score, do you know how close the Assembly is to asking for tenders for the development of those large scale wind farms in Wales?

**Ms Allen:** I do not know.

**Q81 Mr Jones:** Is it the case that most of the SSAs in Wales are on Forestry Commission land?

**Ms Allen:** Yes.

**Q82 Mr Jones:** Who controls the Forestry Commission land in Wales? Is it the Assembly?

**Ms Allen:** I do not know, sorry.

**Q83 Mr Jones:** Is it the case, therefore, that the DTI. What I find paradoxical is whilst on the one hand the National Assembly has set out the framework for onshore wind farm development through documents such as TAN 8, which are planning documents, nevertheless the decision as to whether and where these wind farms are developed still resides with the DTI so far as the large scale ones are concerned because of the fact that these are reserved powers. What I am finding interesting is to see whether there is any sort of liaison or, if you like, dovetailing of the two roles here.

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**Q84 Mr Jones:** What is the going rate of rent for a 50 megawatt onshore wind farm in this country?

**Ms Allen:** I do not know.

**Q85 Mr Jones:** Could you find that out and let us know?

**Ms Allen:** Certainly. It will be the case in certain instances that the developer buys the land, I would have thought that is the usual model, so it is not a question of paying rent to a landowner.

**Q86 Mr Jones:** Certainly rents are paid and if you could possibly let us know what the going rate is for a 50 megawatt wind farm, I am sure the Committee would be very grateful.

**Ms Allen:** Sure.

**Q87 Mrs James:** Your memorandum talks about the role of the Assembly re offshore generation. Can you explain to us the difference in planning applications under the Transport and Works Act 1992, which is a devolved matter, and applications under the Electricity Act, which is not a devolved matter?

**Ms Allen:** Yes, you are right, the Transport and Works Act is a devolved piece of legislation because it is classified as a planning piece of legislation, and planning is devolved, whereas the Electricity Act deals with energy matters and, therefore, is a reserved matter. It is the case where a developer is planning an offshore wind farm in Wales they would have a choice as to whether they wish to apply for consent under the Transport and Works Act or under the Electricity Act. We are seeing the difference in round one of offshore wind where, for example, North Hoyle development applied to the DTI under section 36 and with the Scarweather Sands project, the application was made to the Welsh Assembly Government under the Transport and Works Act. That is entirely a matter for the
developer to decide. In both cases the developer needs a Food and Environmental Protection Act licence. Again there is a split there because in England those licences are handled by Defra, in Wales they are also handled by Defra but the decision is made by the Welsh Assembly so Defra is acting on behalf of the Welsh Assembly in processing those applications.

**Q88 Mrs James:** It is quite clearly set out that you can make an application, whichever way you believe is the correct one for your application, either to the Assembly or to the DTI?

**Ms Allen:** That is right. That applies in territorial waters, the Transport and Works Act does not apply outside of territorial waters.

**Q89 Hywel Williams:** Can I ask you about biomass and how significant is it as a producer potentially of electricity?

**Mr Shanahan:** As the Committee may be aware the Government commissioned a taskforce on biomass which was led by Sir Ben Gill, President of the NFU, which published a report to Government on October 25 last year which indicated a potential of around 5% of electricity production coming from biomass and gave thought as to the fact particular regard ought to be given to the use of biomass for heat production. The Government is currently considering its response to that report and it is expecting to publish its response by the end of April.

**Q90 Hywel Williams:** Would that be of significance on anything more than a local scale for production?

**Mr Shanahan:** Biomass can be used at quite a variety of scales and quite a variety of energy end users. For example, it can be used in coal firing in large coal-fired stations, it can be used in heat production whether on a domestic scale or as part of an industrial process. It can be used in transport production as well. There are a variety of local or more regional scales.

**Q91 Hywel Williams:** What resources are the UK Government investing in developing biomass?

**Mr Shanahan:** The Government committed £66 million towards capital grants for biomass projects around two years ago and those projects have come forward at a variety of timescales including, for example, one CHP project in Port Talbot that has been supported under the scheme. It supported a variety of electricity CHP or biomass scheme projects. The Government is considering what further support might be required in the context of both the climate change programme and also in terms of its response to the biomass taskforce.

**Q92 Hywel Williams:** I saw the reference in your submission about Port Talbot, are there any other projects in Wales that you are investing in? Can you give us an idea of the proportion of the sum of money invested specifically in Wales?

**Mr Shanahan:** I do not have the figures to hand.

**Q93 Hywel Williams:** You refer, also, in your submission to us to the potential that the IGER project has in Aberystwyth. Are you aware that there have been some difficulties there recently and will that impact at all on the potential you might see?

**Mr Shanahan:** I was not aware of the difficulties there.

**Q94 Hywel Williams:** Some redundancies?

**Mr Shanahan:** That would be more through the Plant Breeding Programme that Defra lead on from a UK Government perspective.

**Q95 Mark Williams:** Are you aware of the scale of the project at IGER? As my colleague has pointed out there are a large number—40—redundancies in the project at IGER? As my colleague has pointed out there are a large number—40—redundancies in the offing and the potential for research and development is already there. Is this a direction we should be moving in? There is an obvious opening there but it is an urgent opening.

**Mr Shanahan:** I will write in terms of the scale of the IGER contribution and the impact that will have.

**Q96 David Davies:** What is the DTI’s assessment of the viability of geothermal energy in Wales?

**Mr Shanahan:** The Government has done quite a lot of studies in terms of geothermal energy, particularly in the 1980s, both in terms of hot dry rock geothermal for which our view is that the main difficulties are both economic and technical.

**Q97 David Davies:** What are the cost factors?

**Mr Shanahan:** I do not have the figures but I understand it was well outside the margin that could operate within the legal obligation, which would indicate that it was a lot higher than £100 per megawatt hour.

**Q98 David Davies:** The megawatt hour is the guiding rate, is it?

**Mr Shanahan:** There were no significant opportunities for cost reduction. Sorry, the figure I have is £190 per megawatt hour in 1990 prices.

**Q99 David Davies:** Did you look at the possibility of using disused mines at all?

**Mr Shanahan:** I understand the Welsh Assembly Government are looking at the feasibility of using Welsh mines at the moment. Similarly in terms of geothermal aquifers the Government spent quite a lot of money, of the order of £10 million in the 1970s and 1980s. Again, although potentially it could be feasible, there were significant technical and economic difficulties in terms of that resource that made it unsuitable.

**Q100 David Davies:** Without going too much off on a tangent, this figure of £190 per megawatt hour, that is a figure which the DTI uses as a sort of guideline figure for the cost effective production of any electricity, or is that simply applicable to geothermal?
Mr Shanahan: The 1990 Review came up with that figure of £190 per megawatt hour as the cost of the technology at that time and it saw little opportunity for reduction. If one considers that the base cost of electricity is around £20 to £30 per megawatt hour—

Q101 David Davies: £20 to £30 per megawatt hour? Mr Shanahan: Yes. —then that is a significant cost differential, and particularly if one does not see the opportunities for cost reduction despite the amount of subsidy that goes into it, then that does not appear to be good value for the taxpayers’ money. Whereas if one considers a wave and tidal stream with the technologies at the moment, the Carbon Trust Report came out last week which gave a minimum cost of £120 per megawatt hour but they were seen as significant opportunities for cost reduction to enable it in the longer term to fit into the renewables market that operates, that is where we see more opportunity.

Q102 David Davies: I wonder if it would be useful if the DTI could supply us with some sort of a table showing roughly what the cost is per megawatt hour of currently used forms of electric generation, nuclear, coal, et cetera: also, the suggested costs at which alternative forms might become financially viable. It could be quite useful for the Committee to have that I would have thought. Mr Abel: Yes, we will do that.

Q103 Mark Williams: I am interested in your submission, the wave and tidal section that there was no reference to the Severn Barrage project. It discussed a number of other schemes but the River Severn has long been considered as a potential prime site. I am wondering what is the status, if any, of that particular project which has been muted for so long? Mr Shanahan: As you say, it is a project that has been muted for so long and there have been quite a lot of studies on it, particularly in the seventies and eighties that looked at it. This could be an 8½ gigawatt project that could provide of the order of 5% of UK electricity demand so certainly it is being considered again in the context of the energy review, and we would expect that the proponents of the Severn Barrage would see this as an opportunity to look at it again. One has to recognise that the current cost estimates of this scheme are of the order of £10 to £15 billion. As a scheme it would, to our mind, raise strong environmental concerns, given the Severn region attracts a number of international environmental designations and the likely impact of such a scale on a sensitive eco system.

Q104 Mark Williams: It is going to be considered as part of the review so, on a scale of seriousness, what are we talking about? Mr Shanahan: As a colleague said all options are currently open under the energy review. One also needs to consider the timescales attached to building this as well but even if you said, go tomorrow, you are unlikely to get any generation until 2020 at the earliest.

Q105 Hywel Williams: Are you still thinking in terms of the schemes muted in the seventies and eighties. I think a barrage and a head of water behind? Are there any emerging technologies which could perhaps be used to avoid some of the more extreme environmental consequences of a conventional barrage? Mr Shanahan: I have not seen any proposals that have any real difference compared with the schemes that came forward in terms of, you are still creating a barrage across the Severn headlands. It is hard to see what real appetite for change there is in terms of the fundamental nature of the scheme.

Q106 Mark Williams: Swansea and Rhyl have been identified as viable sites for tidal power. What support is DTI giving to those projects? Mr Shanahan: In those terms those, are tidal lagoon schemes. Our view is that these are technically feasible in terms of being the application of fairly well understood technologies and would be eligible for support as most renewables are through the Renewables Obligation. We have commissioned an independent assessment of this form of generation that suggests that the costs of the energy are prohibitively high and we expect to publish this work shortly. If the claims of the proponents of the schemes themselves are justified, which claims that they can operate in the £40—£50 per megawatt area, then we would see them having no difficulties in putting forward a case that private funding would bring forward because that would fit within the level, which would fit quite comfortably under the renewables obligation framework. Then the only issue is a matter for the developer on a case by case basis and he will need to bring forward the environmental impact assessments at the same time and go through the section 36 process as appropriate.

Q107 Mrs James: Obviously as a Swansea MP this is quite a big issue locally. I was a bit surprised to hear you say that it is prohibitively high prices at the moment because obviously we are thinking long-term in the energy review and we have already heard about new technology coming on and they are individual projects. Are they part of a more coherent strategy to develop new forms of energy in Britain and in Wales? We talk a lot about what we could go with tomorrow but I am thinking 20, 30, 40 years ahead, we are going to have even more pressure for these renewables. Mr Shanahan: I guess I can leave it to colleagues to say about the wider framework that will come forward the energy review on which the doors are open. We have put in place quite a wide suite of measures that are there to bring forward the long term technologies, both through the funding that you mentioned earlier, the order of £500 million has gone towards renewables technologies since 2002 through the work of the research councils and the Carbon Trust. We do see there is a framework in place to bring forward longer term technologies.
Mr Abel: Building on what Gary said there, clearly for the developer the economics have got to stack up from the time they expect it to commission. There are the short term and medium term issues there. That is not inconsistent, that is always going to be the case, that is a matter for commercial judgment of market participants with the wider and long range efforts to promote different suites of technologies, as Gary says, and overall looking at the energy mix and the various options will be very much part of the energy review.

Q108 Mrs James: What I would not want to happen is for us to erase something at the moment. The report could say this technology is no good and 30 or 40 years down the road we would need to look at it again because we were desperate for any form of energy production. I would not want to close the door on anything.

Mr Shanahan: What we would give in the report is our current indication of what the costs are and that would still be the case whatever the longer term market framework is.

Mrs James: That is a relief.

Q109 Mr Jones: I would like to turn to hydroelectric power. Could you tell the Committee what proposals the DTI has for the further development of hydroelectric power in the UK and to what extent is there room for further development in Wales?

Mr Shanahan: It is not my area, but in terms of the longer term and the wider renewables context, most people are fairly clear that there are limited opportunities for large scale hydroelectric development in the UK, primarily because of environmental concerns. On a micro level it is something, for example, that the Clear Skies Programme has supported and we estimate to have around 90 micro hydro sites in the UK. It is something which will be looked at in the context of the micro-generation strategy, the potential for micro-hydro which we are aiming to publish around April this year.

Q110 Mr Jones: What are the environmental concerns about large-scale hydro-electric power stations?

Mr Shanahan: It is similar in some respects to some of the issues that I talked about on tidal barrage, the fact that you will be changing what can be quite vulnerable ecosystems by changing the course of the water is what most people see.

Q111 Hywel Williams: Can I take you on to very small production of hydropower. I have had a number of cases in my constituency of individual farmers wanting to set up very small scale hydro-generation and they have been refused on environmental grounds because the level of abstraction from water courses would be too high. Is that an absolute fixed percentage or are you reviewing that in parts of your broader consideration? As I understand this it varies from place to place. In Scotland, for example, a greater amount of water is allowed to be abstracted.

Mr Shanahan: I think this is straying more into are the short term and medium term issues there. That is not inconsistent, that is always going to be the case. I can look into it in terms of the impact water abstraction will have on the viability of micro-hydro if that is helpful.

Q112 Hywel Williams: In your memorandum you say that the constraints are both environmental and lack of attractive sites. Is that the case, also, in respect of not only generation but of pump storage schemes, of which there is a very large one in my constituency? Are there any other sites which might lend themselves to that sort of scheme? Is the environmental impact exactly the same as abstracting from the river?

Mr Shanahan: I do not know. My first thought would be that if there were some attractive sites then the Renewables Obligation would have seen them come forward quite quickly.

Q113 Mr Jones: Can I ask one question on the pump storage scheme. Presumably you are familiar with that. Is it the case that all the turbines at Llanberis are not operating?

Mr Shanahan: I do not know.

Q114 Mr Jones: It was the case until fairly recently that two of them were in mothballs, as I understand it?

Mr Wagstaff: I do not think we have any information on the current state of it, I am afraid.

Q115 Mr Jones: Could you possibly obtain it?

Mr Wagstaff: Yes.

Q116 Chairman: Could I end with what might appear to be a hypothetical question. We have had a lot of discussion this morning about wind farms and planning permission. Imagine a situation where the North Wales coast would be designated as an Area of Outstanding Natural Beauty or a national park and similarly South Wales Valleys is designated as a national park similar to Brecon Beacon or a World Heritage Site. How differently would those places be treated?

Mr Wagstaff: This is a bigger question than just Wales, it is really a question about to what extent do we want to have energy production located in the UK rather than imported and if we want it located in the UK what sort of energy is it going to be and what are the impacts of that which goes right across coal, nuclear, wind, everything has its impact. It is one of the reasons, and this is something I want to stress in any case to the Committee, that this review involves many different government departments and many different agencies and many different organisations, public, private, voluntary, etcetera, because, of course, the planning issue is one but only one of these many different balances. You are absolutely right, of course, that it would make a difference but I do not think we can say what sort of difference it would make. Undoubtedly it is one of
the factors that gets put into the equation. I think it is a big challenge for everybody to make sure that the answer that comes out of the other end of the equation is the right one, if indeed there is a right answer.

**Chairman:** Thank you very much. Thank you for your evidence and thank you for your memorandum. We will write to you to prompt you on the issues which we want further collaboration on.

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**Supplementary Memorandum submitted by David Wagstaff, Department of Trade and Industry**

**WELSH AFFAIRS COMMITTEE INQUIRY: ENERGY IN WALES**

Thank you for your letter of 1 March confirming the further information that the Committee require from us following the oral evidence given by officials on 31 January. This letter and its annex contains that information.

**Q19** *(why is nuclear not included in the definition of renewable?)*

I did in fact supply an answer to this question later on during our hearing in answer to Q28, when I said:

“I will hand over to my colleague in a moment, but could I first say that I do now have an answer to your previous question about the renewable categorisation of nuclear. It boils down to the fact that it [nuclear] is a finite source of fuel. Although it shares the environmental benefits of renewable energy in that it does not emit carbon dioxide at the point of generation, because it is [powered by] a finite fuel source it is not renewable in the dictionary definition.”

And in answer to Q36 I said:

“It is certainly not infinite in the sense that solar or wind is. I think that is really the definition you are getting at. It relies on an input that has to be got out of the ground.”

**Q46** *(Practical problems of extending the lifetime of Wylfa)*

The Department is aware of the close links between AAM and Wylfa Power Station. No power plant can run indefinitely and the planned closure date of Wylfa (2010) has been known for some time. DTI Officials are working with the Nuclear Decommissioning Authority (NDA) to explore the scope for extending the life of Wylfa beyond 2010. However, at this stage such an extension looks unlikely. Magnox is quite old technology and the NDA have informed us that a combination of factors such as the age of the plant, related safety concerns, and the closure of associated fuel reprocessing facilities at Sellafield mean that an extension is unlikely.

Our understanding is that the issue for AAM is not so much whether Wylfa continues to generate electricity but whether AAM can continue to have access to electricity at a rate that continues to make the smelter economically viable. In recognition of this, DTI officials are working with colleagues in Wales to look at possible options to help Anglesey Aluminium find an economic source of energy when the current contract with Wylfa expires. Clearly, there are difficult and complex socio-economic issues that will need to be addressed as the Wylfa power station approaches the end of its operational life. It is for this reason that the NDA has had many discussions with Anglesey’s stakeholders, and is well aware of the significance of the planned closure of Wylfa. The NDA intends, with DTI support, to play an active role in minimising the adverse impact of Wylfa’s closure on the Anglesey community.

**Q60** *(New technology for accessing remaining Welsh coal reserves)*

Accessing remaining Welsh reserves is not an issue of new technology. Most of the reserves are at shallow levels and only suitable for surface mining. Technologies in this sector have improved over the past decade.

**Q63** *(Possibility of funding for a new mine at Margam)*

The two mines receiving Coal Investment Aid (CIA) funding are Tower (total awards of £3.06 million and expected to run out of usable reserves in 2008) and Aberpergwm (awarded £3.51 million to support a project which should access 10 or more years of reserves). CIA is only available to mines in which were in operation for most of the period July–Dec 2002, so new mines would not qualify for support.
Q95 (Details of IGER project)

Energy crop research undertaken at IGER is largely funded externally, but there is support of the underpinning science through BBSRC Core Strategic Grant. Energy crop research is a relatively new area for the Institute (since 2003) taking place within the Plant Genetics and Breeding Department, and currently split between two interacting groups in the Molecular and Applied Genetics Programme (Iain Donnison’s Group), and the Non-Forage Crops programme (John Valentine’s Group).

Valentine Group research focus

1. Breeding for genetic improvement of Miscanthus productivity/robustness traits, including assessment of desirable traits and production of hybrid varieties.
2. Demonstration and monitoring of SRC willow production for renewable energy in Wales, including the identification of hybrid genotypes fit for this purpose.

Donnison Group research focus

1. Identification of biomass (especially Miscanthus-derived) chemical composition affects on thermal conversion and emission properties (for use as feedstock for co-firing).
2. Identification of grass quality traits for improved biofuel processing.

External funded work

— Growing energy in the Atlantic Area: opportunities for large scale development. 2004–06. European Commission funding.
— The development of sustainable heat and power fuelled by biomass from short rotation coppice in Wales. 2004–08. ERDF funding.

Current work on Miscanthus draws heavily on a wider base of grass breeding and molecular genetics in the PMG Dept, in particular utilising genetic/genomic resources for Festuca, Lolium and maize, and is increasingly tying into broader underpinning research on grasses. The total external funding on these projects is ca £650k per annum. This is at risk depending on renewal of project funding at the end dates of the above awards.

BBSRC core-funded work

Energy-related research on biomass is underpinned by £1.85 million of Core Strategic Grant from BBSRC, engaging ca 24 FTE staff. This covers a range of skills.

The institute occupies a strategically important niche by leading the national research effort for Miscanthus. Serious loss of functionality would clearly compromise IGER’s current and likely future capability to contribute to this area of energy crop research.

Impact of post losses

The IGER Business Plan proposes protecting capability in energy-related research and seeks to retain critical capacity in this aspect of the portfolio, but the outlook is uncertain. Based on the current state of planning the redundancy programme, IGER anticipates no more that 1 x FTE (c £85K FEC) reduction in BBSRC-funded core support of energy-related.

Q102 (Comparative costs of different forms of electricity generation)

The main investment options for future large scale electricity generating capacity are gas (using CCGT where technically and financially feasible) and coal (with or without capture and storage of the carbon emissions), nuclear, Combined Heat and Power (CHP) and renewables. There is a wide range of estimates for the costs of these technologies, depending on the assumptions made, among other things, about fossil fuel prices, carbon prices, trends in the capital costs of the plant concerned, the economic life of different types of plant and the rates of return required on investments.

The Department is aware of a number of recent studies on the comparative economics of generation technologies. These include reports by the Royal Academy of Engineering, University of Chicago,
Massachusetts Institute of Technology and Oxera. I am attaching as an annex to this letter a summary of the main conclusions of recent studies published by the Government and by other organisations. This will also, of course be considered in the Energy Review.

10 March 2006

Annex

A SELECTION OF STUDIES ON THE COMPARATIVE ECONOMICS OF DIFFERENT FORMS OF GENERATION

This annex summarises the results of a number of studies on the comparative economics of different generating technologies. It is not an exhaustive list and only briefly presents key findings. Government studies have included:


Other organisations have also published studies including:

- The University of Chicago (2004);
- Royal Academy of Engineering (2004);
- David Hume Institute (2004); and
- The Massachusetts Institute of Technology (2003).

The Government does not endorse the conclusions of studies published by other organisations. The studies all show a wide range of numbers from different sources and there is also some overlap between the ranges for different technologies. It is impossible to say unequivocally that one technology is cheaper than another because different assumptions about capital costs, fossil fuel prices and carbon prices all affect the relative competitiveness of different generating technologies.

GOVERNMENT STUDIES

PIU Estimates

The following table shows the PIU estimates for new plant in 2020 for, onshore and offshore wind, nuclear and gas-fired generation. The costs shown for onshore and offshore wind did not include system intermittency costs. These were estimated to add up to 0.1p/kWh for a 10% contribution from intermittent sources of generation and up to 0.2p/kWh for a 20% contribution.

<table>
<thead>
<tr>
<th>Technology</th>
<th>p/kWh</th>
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<tbody>
<tr>
<td>Onshore wind</td>
<td>1.5–2.5</td>
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<tr>
<td>Offshore wind</td>
<td>2.0–3.0</td>
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<tr>
<td>Nuclear</td>
<td>2.5–4.0</td>
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<tr>
<td>Gas</td>
<td>2.0–2.3</td>
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Interdepartmental Analysts’ Group Estimates

The IAG comprises analysts from DTI, DEFRA, DiT, Treasury, Carbon Trust and Energy Saving Trust. It was established in January 2001 to address the recommendation by the Royal Commission on Environmental Pollution that the Government should commit itself to a 60% reduction in carbon emissions by 2050. The Group looked at a similar range of low carbon generation options as the PIU and reached the estimates in the table below. The estimates for onshore and offshore wind, as with the PIU, did not include the costs associated with intermittency.

<table>
<thead>
<tr>
<th>Technology</th>
<th>p/kWh</th>
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<tr>
<td>Onshore wind</td>
<td>2.0–2.5</td>
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<tr>
<td>Offshore wind</td>
<td>2.0–3.0</td>
</tr>
<tr>
<td>Nuclear</td>
<td>2.6–4.0</td>
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<tr>
<td>Gas</td>
<td>2.3–2.9</td>
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**White Paper Modelling Work**

For the energy White Paper the Government commissioned additional external modelling work from Future Energy Solutions (FES) using the MARKAL model. Assumptions made included the costs of both gas- and coal-fired generation (with and without carbon capture and storage). These estimates were based on the experience of the modelling team but were also discussed at a workshop with representatives from all the key generation technologies.

<table>
<thead>
<tr>
<th>Technology</th>
<th>p/kWh</th>
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<tbody>
<tr>
<td>Gas 2000</td>
<td>2.2–2.4</td>
</tr>
<tr>
<td>Gas 2020</td>
<td>2.1–2.2</td>
</tr>
<tr>
<td>Coal 2000</td>
<td>3.6–3.9</td>
</tr>
<tr>
<td>Gas (capture and storage) 2000</td>
<td>3.5–3.7</td>
</tr>
<tr>
<td>Gas (capture and storage) 2020</td>
<td>3.0–3.2</td>
</tr>
<tr>
<td>Coal (capture and storage) 2000</td>
<td>5.7–6.1</td>
</tr>
<tr>
<td>Coal (capture and storage) 2020</td>
<td>4.5–4.9</td>
</tr>
<tr>
<td>Nuclear 2010</td>
<td>3.4–3.7</td>
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<tr>
<td>Nuclear 2020</td>
<td>2.7–3.0</td>
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Note: 2000 means plants built in the decade 2000–10 etc. Since the publication of the Energy White Paper, assumptions for fossil fuel prices would now be higher and this would affect the future cost of gas-fired generation.

**Renewables Innovation Review**

This review was undertaken in 2003 after publication of the Energy White Paper. As part of the review, OXERA were commissioned to undertake modelling work on the costs and potential for renewable generation technologies as part of the above review. Assumptions about capital costs, discount rates and other factors affecting generation costs were agreed with the Department. The modelling work included cost estimates for additional investment in the transmission system to handle an increased share of offshore wind generation as well as the cost of providing back up capacity for intermittent sources of generation such as wind. For onshore and offshore wind turbines constructed in the years shown the model suggested the costs in the following table.

<table>
<thead>
<tr>
<th>Technology</th>
<th>2005 p/kWh</th>
<th>2010 p/kWh</th>
<th>2015 p/kWh</th>
<th>2020 p/kWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onshore wind</td>
<td>3.1–4.0</td>
<td>2.7–3.6</td>
<td>2.6–3.4</td>
<td>2.5–3.2</td>
</tr>
<tr>
<td>Offshore wind</td>
<td>6.0–7.6</td>
<td>4.4–5.5</td>
<td>3.9–4.9</td>
<td>3.0–4.6</td>
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**Studies by Other Organisations**

*The Economic Future of Nuclear Power (University of Chicago)*

This study compared the costs of nuclear generation with those for coal and gas generation. It concluded that, in the absence of federal financial policy assistance, new nuclear plants in the next decade would have a levelised cost of $47–71/MWh compared with $33–41 for coal and $35–45 for gas.

*Can we afford to keep the lights on?*

(Royal Academy of Engineering): This report estimated that electricity from offshore wind farms would cost at least twice as much as that from conventional sources. The study put all energy sources on a level playing field by comparing the costs of generating electricity from new plants using a range of different technologies and energy sources. It concluded that the cheapest electricity would come from gas turbines and nuclear stations, costing just 2.3 p/kWh, compared with 3.7 p/kWh for onshore wind and 5.5 p/kWh for offshore wind farms.

*Tilting at Windmills*

The Economics of Nuclear Power (David Hume Institute): This report questioned whether the economic analysis of wind energy justified its increasing use. It stated that the cost of generating electricity from wind power was approximately twice that of the cheapest conventional alternative source and that the cost of subsidising renewables by 2010 would be around £1 billion per year.
The Future of Nuclear Power (Massachusetts Institute of Technology)

Key conclusions were that nuclear power was not currently an economically competitive choice. If in the future carbon dioxide emissions carried a significant price, nuclear energy could become an important option for generating electricity. The conclusions were based on a model to evaluate the real cost of electricity from nuclear power versus pulverized coal plants and natural gas combined cycle plants (at various projected levels of real lifetime prices for natural gas), over their economic lives.
Tuesday 7 February 2006

Members present:

Dr Francis Hywel, in the Chair

Mr Stephen Crabb
David T C Davies
Nia Griffith

Mrs Siân C James
Mr Martyn Jones
Jessica Morden

Witnesses: Professor Phil Bowen, Division of Mechanical Engineering and Energy Studies, Cardiff University, Member of the Welsh Development Agency’s Energy Centre of Excellence, Professor Dennis Hawkes, Former Director of the Sustainable Environment Research Centre, University of Glamorgan and Mr Kevin Mowbray, Head of Welsh Energy Research Centre Secretariat, Welsh Energy Research Centre, gave evidence.

Q117 Chairman: Good morning and welcome to the Welsh Affairs Committee. Thank you very much for coming today, and thank you for your memorandum. Could I begin by asking you to formally introduce yourselves?

Mr Mowbray: Kevin Mowbray, Head of the Secretariat from the Welsh Energy Research Centre, employed by the University of Wales, Swansea.

Professor Bowen: Phil Bowen from Cardiff School of Engineering, Cardiff University; and I work under the Welsh Development Agency’s Centre of Excellence for Energy.

Professor Hawkes: Dennis Hawkes, from the University of Glamorgan, working with the Sustainable Environment Research Centre, but one of its branches is a hydrogen research, which I am mainly involved in.

Q118 Chairman: May I begin by putting on record my congratulations to you on the launch of your Centre and upon your wisdom in the location of your Centre in my constituency. Could you begin by explaining to us the remit and scope of work conducted by your Research Centre?

Mr Mowbray: The Welsh Energy Research Centre was formed in the summer of last year. The Welsh Energy Research Centre is a collaboration of all the research bodies who are active in the energy field in Wales and that includes HEI institutes and other independent research bodies. The five objectives of WERC are: to increase the impact of Welsh energy research by using the critical mass generated by the multidiscipline research that we do; to use that critical mass to attract R&D investment to Wales from sources such as DTI, EPSRC, EU Framework 7 and external industry sources and we focus on collaboration and multidisciplined pots of money; another objective is provide independent authoritative advice to the Welsh Assembly Government on energy policy, if asked, to support the Welsh economy by knowledge transfer; and we are working on building a close liaison with the UK Energy Research Centre and other international centres of excellence. The Welsh Energy Research Centre is directed by a Steering board of which Professor Bowen and Professor Hawkes are members. The board members represent technology areas, as opposed to their own institutes. New board members can be invited on to the board for particular technologies when the need arises. The board meets quarterly and time is set aside for each technology area to be commented upon. The board is supported by the secretariat which also provides the daily operational running of the WERC. The secretariat develops and maintains the industry and academic network to fulfil the objectives of knowledge transfer and economic development. It also searches for available funding for collaborative interdisciplinary work. The secretariat is supplied at this time by the Sustainable Energy Technologies network at the University of Wales, Swansea. The network is funded by the Knowledge Exploitation Fund until June this year. The secretariat is working toward longer-term funding. The secretariat is working with the Welsh European Funding Office at this time to achieve Objective 1 funding to finance up to 20 energy projects, with a total worth of all those projects of £8.5 million. Current events so far have been a multidiscipline seminar on current energy research, which was held at Port Talbot. I would like to thank Dr Francis for coming to that event in September. Our latest seminar was a marine renewable energy route map held in Pembroke in December of last year.

Q119 Chairman: Thank you for all that information. Can you give us a bit more detail about your funding? Where do you get your funding from, the UK Government, the Welsh Assembly Government or some other source?

Mr Mowbray: The board itself is funded by the time currently generated by the academic professors from each of the universities. They are employed full-time and then turn up for the board, give advice and work together to collaboratively operate. The secretariat is paid for by the Knowledge Exploitation Fund. The KEF funding is 50% from the Welsh Assembly Government and 50% from European Objective 1 funding. That money will run out in June this year. We are currently working with the Welsh European Funding Office to get Objective 1 money for the longer term. Part of that project money will fund the secretariat, hopefully, for a period up to 2008.

Q120 Chairman: Will the Centre benefit from the research assessment exercise? Will there be any spin-off from that?
Mr Mowbray: The research assessment exercise will deliver money through HEFCW to the institutes for research. The WERC in its current form will not benefit from any RAE funding. It is purely operating on external funding.

Q121 David Davies: What is the total funding for the exploitation fund which the WERC access? You said you had 50% from European sources and 50% from the Assembly?

Mr Mowbray: The Knowledge Exploitation Fund I believe had something like £11 million.

Q122 David Davies: Of that, how much goes to the WERC?

Mr Mowbray: £50,000.

Q123 Chairman: You referred in your first answer to your relationship with the Welsh Assembly Government, how does the work of the Welsh Energy Research Centre relate to the UK Government policy, which is very important when you consider the evidence we have had from the DTI, where it has in effect an overarching influence over the Welsh energy policy?

Mr Mowbray: With regard to the Welsh Assembly Government’s policy on energy, I believe there is no defined policy towards energy because at the moment they have the route map consultation out at this time. The policy I believe will be developed after the UK Energy Research in the summer. I believe the Welsh Assembly Government’s policy at the moment is to keep in line with UK policy in the development of clean technologies, up to 10% in 2010. The WERC is working towards developing those technologies that can take you to that stage in 2010.

Q124 Chairman: You do not have a direct interface with the DTI in terms of guidance policy formulation and finance?

Mr Mowbray: We have not yet developed those links. The links we do have are people like Professor Hawks working with the DTI on schemes such as SuperGen and other grant schemes that we bid for independently. The WERC is not yet evolved enough to actually become a vital part of DTI’s interaction. We are developing those routes as we go along.

Q125 Chairman: Have you thought much about your interface with the UK Government? It seems, quite understandably, in your early stages that the interface with the Welsh Assembly Government is a very strong one?

Mr Mowbray: Yes.

Professor Hawkes: You must understand that WERC is at a very early stage. Its importance is in its potential rather than what has happened at the moment. The funding has been very low; and there have been no big activities yet. However, we are involved with the DTI in other aspects, as individuals. I, for example, am supported by the DTI on the International Energy Agency on annex 21. Those are the sorts of areas we feed into the policy side of the UK Government. A colleague of mine sits on the IPHE—the International Partnership for Hydrogen Energy. Those are the sorts of areas where we do have involvement, but that is as individual organisations or as individual people rather than as WERC?

Q126 Chairman: Do you have any relationships with other similar centres? Are there similar centres in Scotland, Northern Ireland, Ireland or countries with similar socioeconomic energy profiles as Wales?

Professor Bowen: I think that was part of the intention, to actually develop along those lines when we first started looking to work together. We are not at that stage to actually exploit that sort of collaboration yet, but it would certainly be part of our overall aims and goals.

Mr Mowbray: We have a lot of contact with the UKERC, especially with John Loughhead the Executive Director of UKERC. I am working with him at this time to develop a research atlas for Wales to discover exactly what skills and expertise we have in Wales which will actually link into a live database with UKERC at some stage.

Q127 Chairman: Is there a similar research centre in Scotland?

Mr Mowbray: Yes, there is a similar research centre. Again, it is at a fairly early stage, and we do not have that close a link with them at this moment; but it is an intention to develop those links. Where we are at the moment is that we are getting to a stage where we have stable funding, where we can actually put the time in to do that. Our priorities at the moment are to find funding to set up the industry network within Wales and to develop the Welsh economy and those links will come as they develop over time allowing industry to do that.

Q128 Mr Crabb: How well do you think the energy policy objectives of the UK Government dovetail with those of the Welsh Assembly Government?

Professor Hawkes: I think the Welsh Assembly Government policy currently has five important strands, say, in the Energy Wales route map; and those five strands are effectively the same as in the UK, so it is very similar in that. There is very little difference in energy policy between the UK and Wales. The major difference comes in terms of delivery. As an example, the percentage approval rates for wind farm applications, for example, in the UK as a whole are as follows: in England, 60% approval; Scotland 93% approval; and Wales 12.6% approval. If you look at the actual “refused” to “accepted”, in England it is 150MW accepted and 76 rejected; in Scotland it is 210 accepted and 16 rejected; and in Wales it is 34 accepted and 236 rejected. You can see that there is a difference in the way in which policy is working out in Wales as against the rest of the UK.
Q129 Mr Crabb: Just thinking about CO2 emissions—officials from the DTI told us that targets would be monitored at the UK level. Is there any merit in monitoring those targets at a regional level as well?

Professor Hawkes: Personally I think we could monitor it at as small a level as possible, because that might give some incentives to individual counties, down to those sorts of levels. We need some kind of competition to get the CO2 levels down. If it is measured regionally it would be better. If it is measured in even smaller areas than that it might be even better to get some competition into the system.

Q130 Mr Crabb: It has been suggested that the topography and geography of Wales means it could play a significant contribution to meeting the UK national targets. To what extent do you think Wales could end up subsidising the targets for CO2 emissions for the rest of the country?

Professor Bowen: Personally I do not see that as a problem. CO2 is a global issue. We need to make the distinction in terms of environmental aspects between global and local pollution. I know it is a different subject, but in terms of CO2 it is so far-reaching internationally drawing a distinction within the UK pointless.

Mr Mowbray: If I could make a personal comment on that. If you are looking at compensation for reducing CO2 in England, if we actually invested in the renewable energies in Wales then by that you would be compensated for by supplying clean energy into other parts of the United Kingdom. Develop the industries in Wales, such as wave tidal biomass PV etc, you will be paid for that because they will be buying your technology and your clean electricity. If you do not develop the industries then we have to buy in from them and we will be paying them.

Professor Bowen: I think it is the incentive thing which is the major issue. It is monitoring CO2 at a smaller level, raising awareness and getting incentives going.

Q131 Jessica Morden: How can we square the circle of wanting more sustainable energy, while limiting its use because of potential threats to the local environment?

Professor Hawkes: I think increasingly we are seeing that economic growth and environmental protection are not exclusive—in fact they go together; and if we generate industry in Wales for environmental protection or, for that matter, for energy security, we will end up benefiting by the industry that we can sell to others. I think that point has already been made.

Q132 Chairman: What is your view of the DTI’s opinion—perhaps “evidence” is to strong a word—that they cannot measure these things at regional level and you can only do it at a UK level? Do you challenge that?

Professor Hawkes: No, I do not challenge that. At the moment they cannot. I do not see any reason why it could not be done at a lower level but at the moment it is not. The evidence is not gathered in that way.

Q133 David Davies: What do you think are the most viable options for sustainable energy in Wales?

Mr Mowbray: Taking the overall picture, there is not going to be one technology that is going to take over. There is not going to be one technology that is going to be able to provide what we need. For example, Wales consumes at the moment round about 9.5 million tonnes of oil equivalent. If you take the biomass, then open land for cultivation is around 700,000 hectares; if you look at 10% of that for cultivation of energy crops, you will actually get round about 0.35 million tonnes of oil equivalent in energy crops. That is 30% of the 10% towards 2010.

Q134 David Davies: Could that increase over a period of time or is that pretty well finite, because unless you actually increase crop yield there is only a certain amount of land and, as you pointed out in your answer, much of that has to be for the cultivation of other crops?

Mr Mowbray: That is pretty much a planning and environmental point of—how much land do you use? You have to have some land left over to farm for food. If you go to IGER—and John Valentine from IGER who is also a member of the steering board is coming here next month—they are developing crops and seeing how they can grow more efficiently and to give more environment. Yes, you can increase that. An important part of biomass is burning waste. That will bring in the Forestry Commission. Then you have also got photovoltaics. Photovoltaic prices are coming down and we soon should have thin film technology. There is going to be a mix of tidal wave, photovoltaics, biomass, bioethanol and biofuels. I never stick my neck out into other parts of the United Kingdom. Develop the industries in Wales, such as wavetidal biomass Photovoltaic prices are coming down and we soon could be compensating for by supplying clean energy

Q135 David Davies: That is obviously all very worthwhile work but to return to the original question, what you are actually saying is to use the example of biomass (which I think is a promising technology) it is only likely to fulfil what I calculate to be one-thirtieth of our energy needs—0.35 million tonnes of oil equivalent out of a total requirement of
9.5 million tonnes. Clearly that is what you see as one of the more promising ones—and I appreciate photovoltaics are coming down in price and obviously we will come on to wind power—but that is not going to plug the gap, and there is a big shortfall?  

Mr Mowbray: I was expressing that as the 2010 target, of around 30% of the 10% target. Over time these technologies will develop, dependant upon the amount of investment we put in them now.

Q136 David Davies: I think we both agree, to take the example that you use . . .  

Mr Mowbray: . . . you cannot go beyond the land you have.

Q137 David Davies: No. It is fair to say that there is a big hole that we need to find a way of plugging, and the existing technologies do not really do that at the moment?  

Mr Mowbray: Certainly in the 20-year period you would have to find something.  

Professor Hawkes: What we do need to do is to start now to invest in these, because in 20 years’ time we will still have the problem. This is perhaps the frustration for us.  

Mr Mowbray: Tidal energy could actually fulfil 20% of Wales’ energy needs but you are talking about a 15-year time line.

Q138 Mr Jones: Excluding costs, which forms of renewal energy offer the greatest output in terms of electricity and power?  

Professor Hawkes: That is difficult to say, I think. Excluding costs, which forms? Again, it depends on the scale that we can get to in any individual technology, and that depends on how soon we start investing in those technologies. What we will be doing in the not too distant future is importing these technologies from other countries who have invested in them. If you look at the investment going into my area, for example, of hydrogen, it is quite large in a number of countries very small relatively to the UK, and almost nothing in Wales. These are the sorts of examples, if we do not invest in the technologies, where we will be importing them later on. Which technologies will give the most? That is very difficult to say. All of them have a contribution to make.

Q139 Mr Jones: Have you considered all forms? Your colleague read out a list but omitted geothermal. I am not saying that for Wales, but there is the possibility of deep geothermal producing enough energy for us all in that one technology. Have you considered that in your consideration of the various forms of sustainable energy that you are considering at the moment?  

Professor Hawkes: Personally, no, we have not; it is not our area, geothermal. I think it is quite a specialist area in which we are not involved.  

Professor Bowen: Professor Hywel Thomas of Cardiff is a colleague of mine and specialises partly in that area, but I do not work directly in that area so I could not comment on its potential.

Q140 Mr Jones: Do you think this is something worth looking at?  

Professor Bowen: Yes.  

Professor Hawkes: Some areas of the UK, as I understand it, are much better situated for that than in Wales. I am not a geologist and I have no idea about these things.  

Mr Mowbray: Part of the remit for the WERC is to actually look at our skills and expertise so we can concentrate on and make use of the critical mass we have, rather than spreading ourselves too wide.

Q141 Mr Jones: We could be spreading out looking at a tiny percentage of energy production from biomass with a bit here and a bit there and missing completely something which could actually solve all our problems?  

Professor Bowen: To pick up on that point and not to forget the potential of clean-up as well, with the fossil-based fuels you have got carbon sequestration technology now being developed and a lot of activity and research money being put into that area. The DTI conference just before Christmas was saying there is a lot of potential, with BP giving evidence. In terms of the bigger picture, you must bear in mind the fossil fuels and what can be done there to clean-up.

Q142 David Davies: Can you shed some light on the confusion that we have sometimes seen over issues of capacity and output of wind farms, particularly relating to those in Wales?  

Professor Hawkes: Do you mean installed capacity, as against the output?

Q143 David Davies: Yes.  

Professor Hawkes: I am not a wind expert but, as I understand it, the installed capacity is what theoretically you can get from the system if it is running 24/7; and the actual capacity is what you get from the realistic situation that you have got, which is somewhat around 28%. Sometimes when you see wind turbines not turning, it is not because they are not working or have broken down—it is because the production is higher than the contract that has been made. Wind farms, as I understand it, operate on a contract with the grid, and that is usually on a half-hour basis; so you predict half an hour ahead what the wind will be. If you can predict it correctly then you get the maximum you can out of that; if you do not, then your contract is such that you cannot supply or you over-supply and you turn the wind turbine off.

Q144 David Davies: People actually have to turn the wind turbines off when it is windy?  

Professor Hawkes: As I understand it because of the regulations, but maybe someone else knows better than I do. I am not an expert.  

Mr Mowbray: Unfortunately the wind does not blow at the right times!  

Professor Hawkes: One of the ways around that, of course, is what we are advocating, that you can use the surplus that you cannot use otherwise by peak lopping, as it is called, taking that off. You can use
Q145 David Davies: With that in mind, what sort of contribution could wind power in Wales make to the targets for UK energy production? Bearing in mind also, it seems to me it is already punching above its weight, because the statistics which you used earlier about wind farms rejected would still suggest to me (and I did a quick calculation here on the figures you gave for Scotland, England and Wales for the number of wind farms rejected and accepted) the total accepted amounts are some 400-odd, 210, 115 and 34, of which Wales has got 35 which is well over 5%, in fact it is almost 10% of the total; and Wales has only got 5% of the total population of the UK. I know where you are coming from—your statistics appear to show that Wales is not doing anything like enough to sanction wind farms; and yet looking at those same statistics, it is possible to make an argument to say that Wales has got twice as many wind farms as its population numbers would suggest it should have.

Professor Hawkes: I was only making the point that there are a lot more rejected applications in Wales than there are in other parts of the UK. I was not making a point of whether there should be more.

Q146 David Davies: How significant a contribution can Wales make? How significant is it? Your figures suggest that Wales is already making a very significant contribution indeed.

Professor Hawkes: The figures suggest that it could make an awful lot bigger contribution. We are not in a competition of who can supply the most in different areas of the UK, I trust. We are trying to supply as much as is practical to get the whole of the UK out of a problem and not just Wales.

Q147 David Davies: The figures would also suggest that wind farms are not a popular option with local people?

Professor Hawkes: They are not a popular option with some people who have been very, very vociferous about their objections; and, I understand where some of you come from, you may be in areas where that is the case. That is largely to do with the lack of a socioeconomic input into the whole system of wind farms, that public education and public understanding is not what it is in some other parts of the world for example. The situation is very different in Navarra, Spain where the population is in favour of wind farms. I think we have got a relatively small but very vociferous lobby against wind farms, in Wales in particular; and that is partly because of how it has been sold, I would suggest, in the past.

Q148 David Davies: How much do you think wind farms have to be subsidised by in order to make them practical?

Professor Hawkes: I do not know the answer to that.

Q149 Mr Jones: Given that industrial-scale wind farms will often be intermittent and damage our scenic areas to the detriment of other sources of income in Wales, such as tourism, are we in danger of over-relying on such industrial scale wind energy as a major source of sustainable energy within Wales? I particularly say “industrial” because there are other options for wind energy, such as small generators on every house, for example, which would be far better in my view. Could I ask you about further reliance on large industrial-scale wind energy?

Professor Bowen: I think that is part and parcel of what we have observed. We are trained to spread that technology base and it is true to say that wind is at the forefront of the renewables push at the moment. As well as the public acceptance, you have also got, as I understand, the MoD constraint as well. There are other barriers for wind. If we can bring all these other technologies, which maybe have a longer bedding-in time; there is the marine situation, for example and we have already mentioned biomass. All these are giving currently relatively small potential impacts in the near-term, but as they come on-stream we can build up on the marine side. That is something where we do have potential in Wales.

Q150 Mr Jones: The answer is, yes, we have problems at the moment?

Professor Bowen: Probably taking a bit too much comfort from it, I would say.

Professor Hawkes: I would say it is not to making too much from wind but it is not enough from the others as well.

Mr Mowbray: In the time line wind is the most productive component we have at the moment. As time goes by reliance on wind will come down, but it is a big element. We are not over-reliant on it; it needs to be part of that mix. Our reliance will come down as other technologies come alive. We can make wind a lot more efficient, as Professor Hawkes was saying, by capping our excess and actually storing it as hydrogen which we can use in transport (which I think has been overlooked) and again in energy production.

Q151 Mr Jones: The storage of any form of energy is a problem.

Mr Mowbray: I come back to your point about small turbines on houses—you can make each house an energy production centre and put solar panels on the roof, and small turbines in the garden which on non-peak times create hydrogen; with smart metering that then feeds back into the system when required and called for and it all combines together. You can also use the hydrogen and put it into your car and go down to Tesco.

Mr Jones: That is a far better way forward than industrial scale wind farms.

Q152 Mrs James: Have you any indications or possible examples of the costs and viability of harnessing energy from marine projects?
Mr Mowbray: The viability is there. If you harness all the potential for Wales you could supply 20% of the electrical needs for Wales. Current electrical needs for Wales are 16 terawatts—that is 16 x 10^12. You can supply 20% of that, which is 3% of the UK needs. You are looking at a time line of around 12–15 years to be able to achieve that. The DTI came down with tidal turbines at around 12p/kilowatt. Other wave technologies are up to around 24-40p/kilowatt.

Mr Mowbray: Because it is Swansea or because it is tidal lagoons?

Mr Mowbray: Because there is a Swansea tidal lagoon being developed at the moment which there is some conflict over. The main thing is that there is not a lot of research to do that. It is a structural engineering project and a planning project.

Nia Griffith: Could you separate wave and tidal?

Mr Mowbray: Wave capture is waves lopping over the side into a basin and draining through generators. Tidal stream is essentially wind farms under the ocean. With tidal streams you can add to the base load. You can actually add tidal streams to the base load because it is six hours in and six hours out and it is constant, unless they switch the moon off.

Mrs James: When the DTI gave evidence here last week they were very sceptical about marine renewable energy, and they also gave the impression that it was going to be very costly. With some of the things you have been talking about here now, you are talking about a long time line. Do you see a time when it will be very cost effective when it will compete fairly with other forms of energy?

Mr Mowbray: Yes, once you get these devices into production the scale comes down. There are two things: firstly, the price of that technology and supply will come down; and, secondly, Wales could sell that technology and also create an industry. Devices do take a long time to develop; devices are expensive to develop. That is the crux we are in with Welsh industry at the moment. Most of the industries in this area are small companies and they cannot afford to spend £5 million pounds to drop one piece of kit into the ocean. Speaking to BP, exactly what they said was, “If you came to us this year with this amount of risk and asked us to put in £2 million then we would not go for it; we are not interested. If you came to us in five years’ time with half the amount of risk but costing £20 million we would invest”. Our developers are stuck. They do not have the money to go forward and develop devices; but they do not have enough production to show to investors, BP and Government to actually put money in. At the moment it is very costly but if you can get that technology going it will bring down the price and it can add to the base load and it is a constant supply.

Nia Griffith: As you say, tidal energy is absolutely 100% reliable unless they switch the moon off. Is it really very short-sighted of us not to actually be investing more at this early stage? Could you perhaps tell us a little bit more about the tidal lagoon technology: what we have got in terms of knowledge and what we need to do to make that viable?

Mr Mowbray: In terms of the tidal lagoon I think you are referring to the Swansea lagoon, which I would like to steer clear of because that is a highly politically-charged subject at the moment in Wales.

Nia Griffith: Because it is Swansea or because it is tidal lagoons?

Mr Mowbray: Because there is a Swansea tidal lagoon being developed at the moment which there is some conflict over. The main thing is that there is not a lot of research to do that. It is a structural engineering project and a planning project.

Nia Griffith: Are you saying we have got the technology?

Mr Mowbray: The technology is there and the engineering is there. It is a case of the planning saying, “Okay, yes, we’re happy to have this here for F amount of years”. In terms of tidal it could be up and running in 18 months, providing supply to the grid; and with Wave Dragon and various wave technology they are looking at having work on-stream by 2008. There is a company called MCT, Marine Current Turbines, financing wind farms essentially; they say they can have that in place by 2009. With more advance technology which is being developed in Swansea University at the moment you are looking at 10–12 years’ time.

Nia Griffith: Essentially you are saying there is away forward here provided there is a will to do this?

Mr Mowbray: Yes, there is a way forward if there is a will to do it looking at the environmental and planning aspects, as opposed to the research side. The DTI and the Welsh Assembly Government, I believe, have looked at this area and have their own opinion. I would not like to step on their opinions of that.

Chairman: Is there a shared opinion of the DTI and Welsh Assembly Government, or is it pushing the boat out too far?

Mr Mowbray: I think the DTI and WAG are together on their opinion. Again, I would like to avoid that question and let Ron Loveland the Chief Technology Officer talk to you on that one.

Chairman: There will be political controversy at every stage of your development as a Research Centre. If you are to be successful you obviously have to engage in some controversy at some stage.

Mr Mowbray: Yes, and probably like to constrain the research aspect as opposed to the engineering and planning aspect of that, to actually just give good advice and good figures and let people, such as yourselves and WAG, work that out. There is a degree there, as Professor Hawkes mentioned earlier on, in the fact that the socio scientists could help a lot more in this area, in looking at public perception and the way forward with these technologies. I think that is a pretty good fundamental part of energy research—the perception of the public—and we need to get the socio scientists more involved.
Q161 Jessica Morden: What are your views on the viability of the Severn Barrage project, and will it become a reality, do you think?

Mr Mowbray: The Severn Barrage will be a huge project sucking in huge amounts of resource. I have been told that could produce around 7% of UK energy needs. In terms of construction, you could say, “Well, what are the energy needs to create the cement which goes into that project?”—that is a question; but, on the other hand, I am reliably told by the marine people in Cardiff, Professor Roger Falconer, there could be a positive effect on the marine wildlife in the Severn Estuary by taking out the sediment and creating more sunlight in the water. On the positive side you are creating clean energy; you are bettering the biodiversity and the bio-life there. On the negative side it is a quite huge engineering project, whether you would get the funding to do that and also the resource planning UK-wide.

Q162 Jessica Morden: If this is going to cost billions and could provide up to 7% of the UK energy needs, is it worth it; is it value for money?

Professor Hawkes: Not at the moment.

Mr Mowbray: I would say if you spoke to a gentleman called Sir John Cadogan, who used to be the Research Director for BP, they looked very closely at this question. He might be a more knowledgeable person on that.

Q163 Jessica Morden: Could you explain a little bit more about the marine wildlife and the benefits to marine wildlife?

Mr Mowbray: Professor Falconer could give you more information on that. I believe the Severn Estuary is 20% sediment and that blocks all of the sunlight. Somehow the barrage would reduce that sedimentation.

Professor Bowen: I think it does give a good example of one of the things we are trying to achieve in the Energy Research Centre, which is trying to cross disciplines which we have not really touched on too much, or given examples of. That is a very good example whereby you have got the power generators interacting with one of the knock-on effects in terms of the environment, which is what Professor Falconer specialises in. You can get this whole-picture type of approach; whereas at the moment we tend to do it in discrete batches, as it were. I think the Severn Barrage is something which should be reconsidered. The barriers are the finance, as you say, and maybe the energy put into creating it in the first place. In terms of the second, on a global scale (with CO₂ emissions being a global problem) then maybe that one is a little easier to comfort yourself with; and the finance one is the one that needs to be concentrated on.

Q164 Nia Griffith: Obviously if we are talking about the Severn, it is a very big project. Has there been any research on similar but smaller projects? We have estuaries all around Wales and they are not only the types you describe, but what people use for hydro things as well, like Spain. Has there been much research done on either using the tide coming into the estuary or using the flow coming down?

Mr Mowbray: Looking at estuaries and tidal, the only one I know of is Swansea University looked at putting a turbine into a river in the Brecons. The Brecon National Park turned round and said, “No, you cannot put that in our river”. They had to actually take it out of the river, strap it to the back of a boat and tow it outside Swansea Bay. That is the only one I know about at this time.

Q165 Nia Griffith: Do you see potential for that in smaller estuaries?

Professor Hawkes: One thing that is not part of the remit, I guess, is energy saving, and I think that is a very important area to be looking at. I think we should and could cut energy uses considerably. If then we also invested the kinds of sums of money that we invested in nuclear in the early days into alternative energy sources, then that is possible. The problem is we are not starting from an ideal situation; we are starting from where we are. Regrettably—because I have views on nuclear having visited an area around Chernobyl which has obviously affected my views—we will be dependent on nuclear for a number of years to come.

Q166 Mr Crabb: Do you think the UK can meet its energy objectives in the next ten, 20 or 30 years without some reliance on a nuclear component to the energy mix?

Professor Hawkes: One thing that is not part of the remit, I guess, is energy saving, and I think that is a very important area to be looking at. I think we should and could cut energy uses considerably. If then we also invested the kinds of sums of money that we invested in nuclear in the early days into alternative energy sources, then that is possible. The problem is we are not starting from an ideal situation; we are starting from where we are. Regrettably—because I have views on nuclear having visited an area around Chernobyl which has obviously affected my views—we will be dependent on nuclear for a number of years to come.

Q167 Mr Crabb: The National Assembly has stated that it is opposed to a second generation of nuclear power stations and the UK Government is still considering it. If the UK does go down the road of pursuing next generation nuclear power stations, how would this difference of approach between the national government and devolved administration be managed? Is it realistic to think that Wales could be nuclear-free if the UK Government has chosen to pursue the nuclear route?

Mr Mowbray: I think under Rule 3637 anything above 50MW the UK Government would take a precedent on what is sited there. At the moment we have five large generators in Wales which if we refurbished Wylfa and working with the new gas generators coming on-stream in the next few years, I believe we have excess power. I think we are okay without adding to the nuclear stock. Professor Hawkes was saying to you this morning about a fuel source.

Professor Hawkes: At the moment we burn gas in a gas turbine generator and that is in the 30% efficiency; whereas the new fuel cells that are being developed by, for example, Rolls Royce megawatt size they are reputed to have a 60% efficiency. If we were to employ those in the future—and I am told they come on-stream next year—then we could increase the efficiency of the use of our natural gas resources that we have coming in to Pembrokeshire, for example, and therefore require less of another
primary energy source. These are the things we need to be thinking of. The other thing we have not thought about at all is transport, and transport is often divorced from energy. I do not know why because transport is a large component of our energy use and should always be thought of together with energy. We need to be thinking about all sorts of things to do with policy which will affect our use of transport, our energy saving and our energy efficient use. All those things need to be thought of together, not only just more ways of getting more energy.

Professor Bowen: I think that is a major frustration across the Research Centre at the moment—the omission of transport. As researchers we think of fuels and applications; it does not matter if it is transport or electrical power generation; but then of course you are forced down certain channels if the politics decide otherwise. If you superimpose on top of that of course aviation is a major aspect that tends to get overlooked in terms of transport, sometimes you can get some quite conflicting points of view if you look at some projects of mass air travel in the future relative to what happens to the net effect on the environment.

Mr Mowbray: Could I just mention of the 9.5 million tonnes of oil equivalent that we use, 4.27 of that is just petroleum, so over 50%. Transport is a major component of the energy chain.

Q168 Mr Crabb: Can you help us understand a bit more about the practicalities involves in extending the life of the nuclear power station and the issues around nuclear waste, for example?

Professor Hawkes: I am not a nuclear expert but I just know that nuclear waste is not a good thing. It is very difficult to store for centuries; and there is no good way of storing it at the moment that has been found. We have problems for the next centuries, not just the next few years, with storing nuclear waste. I am biased and I admit that.

Professor Bowen: We do have expertise within the Energy Research Centre. Professor Hywel Thomas specialises in that area. Again, I am not in a position to comment.

Q169 Mr Crabb: Is Professor Hawkes’ bias shared across colleagues within the Research Centre or is there a diversity of views about nuclear; or would you say that your view is the dominant strain within the Research Centre?

Professor Hawkes: I think it is a view shared by Rhodri Morgan according to his latest pronouncement in January! My view is coloured by the fact that I visited the area around Chernobyl. I know that the current nuclear power stations are not the same as Chernobyl but the effect of the leakage there is immense. If you have not visited those areas you cannot imagine what it is like to have thousands of acres of land just derelict and not able to be used for centuries to come. Those who survived moved out and were displaced. When visitors came to our university from that area the only thing they wanted to take back with them was a Geiger-counter so they could measure the food they were eating. That is serious. I would have to be persuaded (and I have not been persuaded) that the storage methods and the safety against terrorist attacks, and all the other things we fear, are adequate before I could be convinced that nuclear was ever safe.

Q170 Mr Crabb: Have you been to Wylfa?

Professor Hawkes: Not that one. I have been to some sites in the UK and I am very impressed and they do it very well, but they have never had a terrorist attack or they have never had a major leak perhaps.

Professor Bowen: I think of it more generally from a risk hazard point of view so I guess I am not quite as far leaning as Professor Hawkes but it is a case with all these technologies of management of risks. There are risks with all these technologies, and the timescale changes and how we manage that and compare different risks and present that to the public is going to be a major challenge, and we do not always get it right. Whether other academics can help in that matter is a moot point, I guess.

Q171 Mr Jones: A question for you, Professor Hawkes, I think your expertise is in hydrogen. Can you tell us about the benefits of hydrogen as an energy source and the realistic possibility of having a hydrogen economy in Wales?

Professor Hawkes: Hydrogen is really an energy vector-like electricity rather than anything else. It is not a primary energy source. You have to produce hydrogen from something else. The benefits of course are once you have the hydrogen, when you burn it in air you get no carbon dioxide and very little other pollution. If you use it in a fuel cell then it is even more efficient and there is no pollution from that, apart from just water vapour, so that is the advantage. You can also convert certain energies into hydrogen. You can convert wind power into electricity and then into hydrogen for use in fuels. Some of the work that we are doing is with biomass and converting biomass to hydrogen and a product from that is able to be transformed into methane. That is work we have been doing for the last 30 years, the methane side of it, so it is the combination of hydrogen and methane which has a name in the States called “hythane” which is a very good fuel for vehicles, with very low NOx and very little pollution. That is some of the work we are doing here in Wales as well.

Q172 Mr Jones: Do you get hydrogen from biomass directly or do you have to go through the electricity route?

Professor Hawkes: No you get it directly. The micro organisms concerned produce hydrogen directly from the biomass.

Q173 Mr Jones: In your paper you outline the several political requirements which are necessary to promote energy policy and you include political leadership, fiscal policy and legislation. How do you
see the division of powers between the National Assembly for Wales and the DTI having an impact on that policy within Wales?

Professor Hawkes: Within Wales obviously the attitude of the Welsh Assembly Government is very important. They have been very supportive in words, they have spoken at many of our meetings and so on, but the finances coming forward have been very, very slow. One of the things that we were talking about on the train on the way up is the frustration we have in the way that things take a year or 18 months to go through the system and it is a very slow process.

Q174 Mr Jones: How confident in that case are you that the timeline that you are predicting for a hydrogen economy within Wales is realistic?

Professor Hawkes: It is the political will really. If the political will is there then that timescale is quite valid.

Chairman: Well, thank you very much and thank you for your memorandum. If you feel that there is additional information that you would like to share with us, particularly from your colleagues who were unable to be present, we would be very happy to receive it. Have a safe journey home. Give my love to Port Talbot.

Written Evidence from Dulas Ltd

Dulas Ltd, based in Machynlleth, is Wales’s leading indigenous renewable energy company. Dulas has over 23 years’ experience in the industry, based around a highly qualified and experienced multi-disciplinary team of 34 professional and support staff and encompassing all aspects of renewable energy from policy formation, market stimulation and resource assessment through to research, design, training, and the implementation of wind, solar, hydro and biomass projects. The Company works not only in Wales, but throughout the UK and world wide. In 2002 and 2003 the Company won the Wales Exporter of the Year Award, for our work in exporting specialist solar powered hospital equipment, mainly to developing countries.

Dulas Ltd has an intimate knowledge of the renewable energy industry in Wales. The company runs the secretariat and organizes the meetings of the National Assembly Sustainable Energy Group. The Company regularly provides policy advice to bodies such as the WDA, and the Welsh Assembly Government, and was an active member of the Technical Advice Group assisting the Welsh Assembly in formulating planning policy for renewable energy in Wales.—TAN8. In England, the Company was responsible for drafting most of the technical Annexes of the English planning policy for renewable energy, PPS 22.

The Company has been at the forefront of wind development, particularly in Wales, having been responsible for gaining planning permission for over 24 UK wind farms since 1991, including 8 projects in Wales. Up until earlier this year, the Company was an independent consultant in the industry, but has now signed a three year agreement with Ireland’s leading wind developer, Airtricity to be their development team in England and Wales.

Installation and commissioning of renewable energy installations is a significant aspect of Company activity. The Company is in the top five of the UK for Solar photovoltaic installations. There is also a significant export market for this technology. The Company has a reputation for technological excellence and supplies products through a UK wide network of renewable energy installers.

Over the past seven years, Dulas Ltd has constructed, or carried out major refurbishment of seven grid connected hydro schemes of over 200kW in Wales. It has part ownership of two of these, and is responsible for the operation and maintenance of a further two.

**OUR SUBMISSION**

Because of detailed knowledge of the industry, our submission focuses on the role of Renewable Energy in addressing the current and future energy needs of Wales; and the current and future provision of energy in Wales. Our submission relates to the following technologies.

- wind farms;
- bio mass energy;
- solar photovoltaic;
- hydro electric energy; and
- other small scale renewable energy.

Solar photovoltaics and other small-scale renewable energy technologies were not in the remit list as drafted by the committee. We consider these technologies to be an important part of the energy supply mix for Wales and suggest that they are included within the remit of the committee enquiry.
Our submission takes as a starting point the findings of the Welsh Assembly Government Economic Development Committee Review of Energy Policy in Wales: Part 1 Renewable Energy (2003). We consider that this document provides key background information on renewable energy resource and opportunity in Wales. Additionally the six key recommendations of the review frame the relevant issues concerning the division of powers regarding energy, renewable energy targets, and the requirement for specific policy initiatives from Cardiff.

We note that, to date, planning policy has been the most significant devolved power in relation to renewable energy development. We have focused particularly on “Technical Advice Note 8—Planning Policy Guidance for Renewable Energy” as we believe this to be the most significant Welsh policy in regard to facilitating the 2010 renewable energy targets.

We provide our input from our 23 years experience of working in the energy sector and our activities to include renewable energy technologies in the energy mix. Our experience in the growth of this sector in the UK and worldwide gives us a fully informed business perspective regarding practical and realistic inclusion of renewable energy technologies in the future energy mix for Wales.

We share the view of the Welsh and UK government that onshore wind will be by far the most important renewable technology in relation to the 2010 targets. The highly visible nature of Wind Farm development means that reaching these targets will be largely a measure of the success of Planning policy in facilitating appropriate development. Our comments on the division of powers, and particularly section 36 consent, is informed by our experience of Welsh Planning Policy.

With regard to planning support for small-scale renewable energy England is currently leading the way with PPS22 empowering Local Planning Authorities to specify a 10% contribution from renewables for new buildings and developments. This approach is being taken up by an increasing number of councils in their UDP. We support this option through which small-scale renewable energy becomes part of the energy supply mix and that a method be found to also support retro-fit of renewable energy technologies. We note that the Welsh Assembly Government has not followed this PPS22 guidance, and that it is unclear whether TAN 8 similarly empowers Welsh local planning authorities to specify a % provision from renewable energy technologies.

Finally, we comment on the current and potential role of the Welsh Assembly Government in promoting and facilitating other renewable energy technologies within Wales.

Wales has varied topography, some of the highest wind speeds in Western Europe and areas of low population density, significant forestry reserves, high annual rainfall and a number of strong tidal races. In short, Wales is well endowed with renewable energy resources.

In 2001 attempts were made to quantify the Welsh Renewable Energy Resource in order to inform the Welsh Assembly Economic Development Committee Review of Energy Policy in Wales (Jan 2003). The report estimated a long term potential, taking account of technical, economic and environmental constraints, in the region of almost 12TWh electricity and 5TWh heat.

These assessments underpinned a number of EDC recommendations including Recommendation 2 which proposed the adoption of a target for Welsh RE generation target for 2010 and 2020.

We recommend that the National Assembly adopts Welsh targets for both electricity production and heat production from renewable sources by 2010 and 2020, bearing in mind the overall target for the UK of 10% of electricity generated from renewable sources by 2010. These targets should be set in the light of the reponses to the consultation on this report.

In order to promote these targets the National Assembly should seek information from all Local Authorities on the contributions that they consider could be made to meeting such targets from within their area.


The Welsh Assembly subsequently chose to adopt a target of 4TWh of electrical production by 2010. This was at the high end of the range of potential targets specified within the EDC report. Regrettably, the Welsh Assembly did not take up the linked recommendation to adopt a similar target for renewable heat production.

Under the established division of powers relating to energy policy the National Assembly had limited opportunity to pursue the set target. The major existing area of influence was recognized to be planning policy, and this informed the EDCs fifth recommendation.
The National Assembly should:
(a) as a matter of urgency, seek ways to clarify and streamline the planning process for renewable energy developments;
(b) seek an extension of its powers with regard to the approval of power generation facilities;
(c) find mechanisms whereby renewables developments can provide immediate and tangible benefits to the local communities in which they are located.


**Renewable Energy Planning Policy**

The urgency of streamlining planning policy was partly a reflection of the challenging timescale to 2010, and partly a reflection of the poor history of consent for wind farm applications in Wales in the period 1999–2003.

<table>
<thead>
<tr>
<th>Region</th>
<th>Consent Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scotland</td>
<td>90%</td>
</tr>
<tr>
<td>N Ireland</td>
<td>75%</td>
</tr>
<tr>
<td>England</td>
<td>50%</td>
</tr>
<tr>
<td>Wales</td>
<td>40%</td>
</tr>
</tbody>
</table>

*(Source: BWEA)*

Whilst the EDC did not suggest a breakdown of the target by technology it is clear that in retrospect the AEAT forecast of outputs from renewable sources over-estimated the role of biomass in producing renewable electricity. In turn this impacted on the development of revised planning policy guidance for renewable energy.

The stakeholder advisory group set up by the Assembly originally proceeded on an assumption of a rough three way split between on shore wind, biomass and “other” renewable electricity technologies. It quickly became apparent that, due largely to the unfavourable economics of biomass electricity production, on shore wind would play a larger role.

**Technical Advice Note 8**

The multi stakeholder interest Technical Advice Group (TAG) was established in mid 2001, and over the next two years, were moving towards a consensus. In June 2003, the TAG was disbanded at very short notice, and from this point on TAN 8 Planning Policy Guidance for Renewable Energy in Wales was produced in house by the WAG. The TAG group was not used effectively and policy development was shrouded in secrecy.

Although a target of 200 MW installed capacity is specified for offshore wind and other renewable technologies. TAN 8 is largely focuses wind energy and is weak on guidance for other technologies. The TAN specifies seven “Strategic Search Areas” within Wales where proposals for large scale wind energy developments will be viewed favourably. Approximately 56% of the land area of these SSAs falls within the landholding of the Forestry Commission, and therefore the overall ownership of the WAG.

The approximate capacity of each area has been estimated, and on this basis a target figure of 800MW of onshore wind has been established. The policy amounts to something close to a presumption in favour for large wind farms within the SSAs, and a presumption against outside these areas. Local Planning Authorities are tasked with further “refining” the SSAs within their areas.

This approach is totally different to the criteria based policy established for England through PPS22. It has effectively created a concentrated developer “land grab” within the SSAs, but has also given developers a fairly irrefutable argument against opposition in these areas.

**Problems with TAN 8 Related to Wind Energy**

An installed capacity of 800 MW of wind and 200 MW of other renewables is unlikely to provide 4TWh per annum. A quick calculation suggests that 800 MW of installed wind capacity in Wales would produce in the region of 2.1TWh per annum based upon a 30% capacity factor.

There is very unlikely to be additional offshore wind installed by 2010, hydro potential is limited to approximately 20 MW additional, and tidal power is unlikely to be commercially mature within this timescale. 20 MW of hydro will produce around 0.07TWh per annum given a 40% capacity factor. This leaves a shortfall in the region of 1.83TWh per annum—equivalent to 219 MWe of biomass generation plant running at a 95% capacity factor.
In addition to falling short of the 4TWh target we are of the opinion that the policy is unlikely to deliver the 2010 target for installed wind energy capacity. We believe that more on shore wind capacity could have been achieved for Wales by this deadline had developers been able to identify their own sites taking into account key technical and planning considerations, under a criteria based policy.

We consider that the two main reasons for missing the TAN8 installation targets will be administrative/ bureaucratic delay and technical/ infrastructure lag. The main technical barrier to reaching the TAN 8 capacity targets by 2010 will be grid availability. In selecting the SSAs the Assembly did not take full account of the importance of available grid capacity for such a large target. The installation of the necessary grid infrastructure is likely to entail a five to eight year time lag in five SSA areas (Brechfa Forest, Nant y Moch, Llandinam, Carno, and Clocaenog Forest).

Additionally, the effect of siting wind turbines within mature forestry is not well understood and has been largely avoided by developers so far. It is far from clear whether wind turbine manufacturers will warrant their machines when deployed in close proximity to forestry. Over 50% of SSA area is within forestry, and whilst the exact effect is unknown the higher turbulence experienced is certainly likely to lead to expensive mitigation measures and lower outputs per installed MW.

Additionally despite the enormous importance of the Forestry Commission landholdings within the SSAs the FC were apparently not consulted at an early enough stage. Consequently the FC have had resource problems in accommodating the practicalities of selective tender, and the incorporation of major development within existing long term forestry planning processes.

Following considerable delay on the part of WAG, the remaining administrative hurdle will be the slow response of local planning authorities, both in terms of refining SSA areas and in dealing with the large number of applications linked to SSAs. As an extreme example, a current application for a windfarm extension on the edge of the Carno SSA has been awaiting planning decision for more than two years.

TAN 8 will strengthen the position in relation to planning policy, and it is therefore likely that the capacity target will eventually be met. We consider that substantial concentrated development will encounter substantial concentrated opposition and this, in isolation, would make it unlikely that the target will be met by 2010. We consider that the time lag relating to grid connection for three to five SSAs will make this timescale impossible. It is interesting to note that the WAG, when presenting at the BWEA Conference in October of this year alluded to a target of 800 MW of consented sites, rather than 800 MW installed capacity by 2010.

BIOMASS

Whilst the WAG has not, as yet, adopted the approach of a Renewable Heat target, as recommended by the EDC it has gone some way to implementing parts of Recommendations 3 and 6 in order to promote a sector with high growth potential in Wales and facilitate the exploitation of local opportunities and resources.

We recommend that the National Assembly continues to develop its own use of renewable energy with the aim of becoming a 100% user of renewable energy and urges other agencies and public bodies in Wales to foster the development of renewable energy by:

(a) switching to green electricity for their own use;
(b) supporting development projects for technologies that exploit local opportunities or unique resources.


We recommend that the Minister for Economic Development identifies the energy sector as a sector with high growth potential in Wales and ensures there are programmes in place to encourage the development of skills in all parts of the country to meet these needs, and to encourage private sector investment in this vital sector.


Biomass fuel in Wales is mainly forestry product or co-product and this is reflected by the stimulus given by the Forestry Commission through the Wood Energy Business Scheme (WEBs) WEBs offers a grant of 50% of the cost of a wood fuel boiler to provide heat for businesses. This initiative has given impetus to the nascent biomass industry in Wales.

Amongst all renewable energy technologies, wood fuel biomass is the one that can bring the highest level of local and regional economic benefit. The wealth generated from the processing and supply of fuel remains within the local economy, rather than leaking out, as in the case of oil and gas. Moreover, fuel supply offers the prospect of additional income streams for the indigenous forestry contracting industry in Wales.
Heat supply is a key energy supply issue. Large scale biomass CHP is rarely economically viable at present, except where there is a large, consistent heat demand in the immediate vicinity. However, biomass heat provision is currently a potentially cost competitive alternative to fossil fuels for some agro-processing businesses and institutions in areas of Wales without access to the gas grid network.

WAG support backed by Objective 1 funding is prompting strong growth in the biomass heat sector and realizing significant local economic benefits.

In line with regional approach identified in RIR 2004, it is possible that in the medium to long term CHP biomass could be a reality in areas with the right heat load. Viability depends on the development of a reliable and robust fuel supply network, and financial assistance of the type discussed within the recent Biomass Task force report.

HYDRO

Although the hydro resource in Wales is limited, with major installations already developed and little potential for smaller schemes above 1MW, there is a good potential for smaller grid connected schemes in the range 200–500kW. There is also a largely unquantified, but potentially significant potential for smaller, domestic scale (10–20kW) small hydro. The UK Government Clear Skies grant programme can offer financial support for such projects, but due to the large capital outlay, the uptake has been patchy.

The Renewables Obligation has been a key driver in enabling the exploitation of previously economically unviable sites, and activity is increasing. All small hydro schemes have to obtain an Abstraction Licence from the Environment Agency (EA). In the past, the EA have been far from supportive of small hydro, often applying an onerous “precautionary principal” to potential impacts on riverine ecology resulting in limitation of the volume of water that could be abstracted, and hence limitation of the energy yield. This often rendered otherwise viable sites non viable on economic grounds. However, dialogue between the EA and small hydro developers over the past few years has led to a better understanding, and currently the EA are much more supportive of small hydro applications than formerly. Notwithstanding this, the precautionary principal towards ecological impact is limiting the development of small hydro in Wales.

The scale of small hydro installations is more suited to the constraints of local initiatives and the sector remains a small but significant indigenous industry.

SOLAR PHOTOVOLTAICS

There is great potential for supply from small-scale renewable energy through installation on new build and retrofit to existing buildings. This brings in an embedded supply and a reduction in future energy supply.

Solar photovoltaics is an established and predictable technology. There are many tried and tested products currently available. The modules have a 25 year performance warranty.

Dulas has much experience of installing and monitoring solar photovoltaic systems. On average a system produces 750kWh pa per kWp. This figure is highly predictable and there is little variation site to site.

Dulas has installed a number of systems in Wales including Bronllys Hospital (60kWp) and Powys County Council County Hall (10kWp).

There is economic development associated with solar PV as the number of installers continues to increase and there is potential for job opportunities and new business start ups.

The predictable, reliable and maintenance free nature of this technology makes it a simple fix that is highly replicable. Through legislating to insist on the inclusion of small scale renewable energy in ALL new building or refurbishment that require planning, a small additional cost for each development leads to significant reduced future energy requirements.

The favourable environment for solar PV includes:

- A TAN 8 presumption for solar PV systems—in place in Wales.
- PPS 22 10% renewables for new developments—in place in England.
- Part L building regulations—European legislation to be implemented regarding energy efficiency and renewable energy.
- DTI grant support at 50%—last round February 2006.

The future for solar pv

There will be more solar photovoltaics installed in Wales during 2006 with DTI grant funding.

New funding support is proposed through the low carbon building programme the details of which are not yet announced. Preliminary indications from the DTI are that there will be £30 million available over a three year period. This will be for larger schemes and innovative smaller schemes. This is likely to have detrimental impact on the domestic PV market and the businesses that supply to this market.
There is concern that the end of the current DTI funding will have a negative impact on the take up of solar photovoltaics. The new proposed scheme is technology blind and does not support the majority of domestic installation. In order to continue to increase the take up of photovoltaics the Welsh Assembly Government has the potential to add value to the UK wide approach.

Potential approaches for the Welsh Assembly Government include:

- Inclusion of guidelines for % requirement for renewable energy in new developments.
- Promotion of the part L building regulations.
- Grant support through the LA or Energy Agencies.
- Promotion to LA’s of the availability of solar electric systems.
- Provision of additional support alongside the Low Carbon Buildings Programme.
- Support for flagship projects.
- Use of solar photovoltaics on Welsh Assembly owned buildings.

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1.9</td>
</tr>
<tr>
<td>2001</td>
<td>2.7</td>
</tr>
<tr>
<td>2002</td>
<td>4.1</td>
</tr>
<tr>
<td>2003</td>
<td>5.9</td>
</tr>
<tr>
<td>2004</td>
<td>8.2</td>
</tr>
</tbody>
</table>

UK Solar photovoltaic installation cumulative from 2000 (MW)

**Other Small-scale Renewable Energy Technologies**

The following illustrates the other small-scale building related renewable energy technologies:

<table>
<thead>
<tr>
<th>Technology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar thermal</td>
<td>For space and water heating. This is an established technology with good products available and businesses in Wales capable of installation. There are two established manufacturers of solar thermal collectors in Wales. There are many installations in the UK.</td>
</tr>
<tr>
<td>Ground source heat pumps</td>
<td>Relatively new to Wales but well established elsewhere in Europe. There are Welsh suppliers of the technology. There are many installations in northern Europe and other colder climates.</td>
</tr>
<tr>
<td>Pellet</td>
<td>Relatively new to Wales but well established elsewhere in Europe. There are Welsh suppliers of the technology. There are many installations in Europe (Including southern Europe) and other colder climates.</td>
</tr>
<tr>
<td>Wood chip</td>
<td>Relatively new to Wales but well established elsewhere in Europe. There are Welsh suppliers of the technology. There are many installations in northern Europe and other colder climates.</td>
</tr>
<tr>
<td>Building integrated small-scale wind</td>
<td>This is a new technology with few installations. It has great potential and there is great market demand. However there are engineering challenges and Dulas has not yet had the opportunity to test any of the emerging products.</td>
</tr>
</tbody>
</table>

**Summary**

1. The current emphasis on onshore wind should continue, as it offers the best possibility for meeting the 2010 target within Wales. Problems have been encountered with TAG and the nature of the TAN itself some continuing problems with the division of powers between Westminster and Cardiff, and between Assembly departments but it is necessary to follow through to have any hope of coming close to the 2010 targets.
2. The Welsh Assembly needs to take a lead (in as far as it is able to) in ensuring the co-ordination of the extension of the electricity grid in TAN 8 and the activities of windfarm developers.
3. Concentration of Wind Development will mean a concentration of opposition and a requirement for direct intervention in areas beyond the current remit/scope of powers of the Assembly—grid exposes the problem of energy policy which WAG had to deliver as Planning policy.
4. A particular opportunity exists in the Biomass strategy scheduled for 2006 and this should be seized. The Welsh microgeneration Action Plan could also offer a real opportunity—particularly because of the potential for job creation.
5. All of this will require serious investment in capacity building and the institutional infrastructure to support it. If Wales is to maximise the opportunity for exploiting renewable resources, there is a strong case for a executive officer (Minister for Energy) in WAG and an all Wales Energy Agency to co-ordinate the efforts of existing regional Energy Agencies.
6. There has been some duplication of effort on the part of WAG and other parastatal and non-governmental organisation in the promotion and stimulation of renewable energy uptake in Wales. Subsuming the WDA into WAG should go some way to help this, as should the establishment of an all Wales Energy Agency.

1 December 2005

Witness: Mr Rod Edwards, Director, Dulas Ltd, gave evidence.

Q175 Chairman: Could I welcome you to the Welsh Affairs Committee and just for the record could you introduce yourself.

Mr Edwards: Good morning, ladies and gentlemen. I am Rod Edwards and I am a Director of Dulas Ltd, a Welsh-based renewable energy company.

Q176 Chairman: Thank you for the memorandum you sent us. In the memorandum, if I could begin by referring to the political context of energy in Wales, you mention “continuing problems” in the division of powers between the National Assembly for Wales and the UK Government. Can you explain the nature of these problems and how they might best be resolved?

Mr Edwards: The first part of the question, yes, I can certainly give my opinion on the nature of them. How they can be resolved is a very difficult question. The Welsh Assembly set an ambitious target for renewable energy in Wales. However, the only way they can really influence the rate of development is through the planning system. As you know, they do not have devolved powers on energy, which means the only means they have of setting the way that energy that is generated within Wales is through the planning system, and I think that is certainly where I perceive the tension to be. How that can be resolved I do not have a clear opinion on this. I can see the difficulties. My belief is that energy has to be a national preoccupation. I find it very difficult to see how the Welsh Assembly could set energy policy within the context of UK energy policy.

Q177 Chairman: If I can put the question in a different way then. How do the DTI and the UK Government’s policies dovetail with the Welsh Assembly Government’s policies and strategies in the field of energy policy?

Mr Edwards: In my own field in renewable energy the overarching policy driver is of course the Renewables Obligation and the 10% by 2010 and 20% by 2020. The Welsh Assembly’s planning policy, the policy that came from the Economic Development Committee, reflected that. They set a target for 2010. Further down, the implementation methods of the DTI, things like the Clear Skies programme, are available to Wales but they are centrally administered through the DTI in London not through the relevant part of the Welsh Assembly Government.

Q178 Chairman: Could you illustrate for us those aspects of the relationships between the UK Government and the Welsh Assembly Government that work well?

Mr Edwards: That is a difficult question to answer. I think what has worked well is the driver of 2010. I think that informed Welsh policy towards renewable energy and that through the planning policy they have acknowledged the 2010 target. They have set an ambitious target and they are driving that forward. Personally I would like to see the support for the smaller renewables and micro renewable generation coming much more through the Welsh Assembly rather than directly from the DTI. I think the Welsh Assembly understand a lot of the imperatives and a lot of the things that are driving the renewable energy economy better than is understood in Westminster, but specific examples of how it has worked really well is difficult because the support mechanisms, for instance, that are available are available through Westminster rather than directly through the Welsh Assembly, except through certain initiatives through Objective 1 funding, things like the support that Finance Wales was able to give. I mentioned the Wood Energy Business Scheme which is supported ultimately by part of the Welsh Assembly Government and the Forestry Commission, which has given a big push to wood fuel biomass.

Q179 Chairman: Which I think leads me almost directly to the question why should an All-Wales Energy Agency be established and what could it achieve?

Mr Edwards: I think it would be a good thing because there are a number of regional energy agencies. There is the Mid Wales Energy Agency, the Conwy Energy Agency and the Swansea Energy Agency. They are largely quangos, for want of a better name for them, largely funded through European funding and with certain funding from different departments within the Welsh Assembly Government, and I think some sort of overall co-ordination of that effort would be beneficial. The energy agencies do a very good job in that they tend to support local initiatives, but I think certainly I reflect the views of the Director of the Mid Wales Energy Agency that a bit more co-ordination of the initiatives throughout Wales would help deliver services better.

Q180 Nia Griffith: You talked about the fact that the Welsh Assembly Government has not adopted the PPS22 guidance that has been adopted by local planning authorities in England for supporting small-scale renewable energy. Could you explain to us the difference then between that PPS22 and the TAN8 and what impact those different procedures have for increasing the role of renewable energy?
Mr Edwards: PPS22 was a lot stronger on energy in the built environment and the smaller micro renewables in that it did suggest in fairly strong terms a 10% target for any new build within the local authority area. It did put the onus on the local authorities to develop supplementary planning guidance to bring that in. TAN8 alluded to it but it did not have that suggested 10% target. What we are seeing at the moment amongst house developers in England is they can see that this is something they have to implement because the local authorities are demanding it. We have not yet seen that driver in Wales. Although TAN8 does allude to it, it is not as strong and it is not as clear as PPS22. I think therefore it is not providing the driver that PPS22 is providing.

Q181 Nia Griffith: So you think there would be a good case for including it in its entirety? Mr Edwards: I do because at the moment it is providing quite a strong driver. We are seeing it. We are having to respond to the larger housing developers, for instance Gallagher’s, in areas where there is large-scale housing development and the local authorities are requiring them to consider energy and local generation of energy in the built environment. Quite frankly, they do not know what to do. Developers are not familiar with the market, they are not familiar with the technologies, and they are coming to companies such as ours for specific advice. We are not seeing that happening from Welsh housing developers at the moment. It may well happen. I know of at least one local authority in Wales that commissioned us to look at the small renewables and make recommendations to them of things that they should be putting in their supplementary planning guidance and they were very receptive to the idea of having a local target. Whether that does eventually become embodied in their supplementary planning guidance I do not know but at least there was the willingness to do it.

Q182 Nia Griffith: Can I carry on on renewable heat. You tell us that the National Assembly of Wales chose to adopt the renewables target for electrical production for 2010 but they did not take up the linked recommendation for renewable heat. Have you got any explanation as to why that may not have been taken up and what the implications of that are? Mr Edwards: My opinion as to why it was not taken up is that there is not a requirement and obligation for renewable heat production in UK national energy policy and therefore the Welsh Assembly did not include it, the EDC did not include it. However, they are fully behind the prospect of using particularly biomass for heat production and have supported major initiatives. I understand that it is under consideration on a UK-wide basis in which case I sincerely hope the Welsh Assembly will reflect that policy because I think it will give an added driver to the renewable heat market which is a very important market.

Q183 Mr Jones: Mr Edwards, if I can quote from your written submission: “We share the view of the Welsh and UK government that onshore wind will be by far the most important renewable technology in relation to the 2010 targets.” Upon what evidence do you base this view? Mr Edwards: At the moment it is the only economically viable, readily deployable renewable energy technology. I think this is reflected in the interim planning policy statement, the ministerial policy statement, and I think it is widely accepted that it is the only large-scale renewable technology that can be implemented fairly quickly. It is very difficult to justify biomass for electrical generation on economic grounds at the moment, although with changes in fossil fuel prices it is becoming more attractive. The technology in the UK is not as mature, it is not as well-known, although in some parts of northern Europe it is very well-known, and I think if the economic conditions were better biomass could become a lot more significant. There are problems in the planning system with biomass. The planning system will have to accommodate certain changes, but the reason I made that statement is that at the moment it is the only technology that can be deployed at any scale, certainly within the 2010 time horizon.

Q184 Mr Jones: That is specifically onshore wind of course. Mr Edwards: Yes.

Q185 Mr Jones: This is not coloured by the fact that you are not now independent consultants but you have actually signed up with an Irish— Mr Edwards:—No, absolutely not.

Q186 Mr Jones:—just let me finish. You know what I am going to say but I might as well say it. Because you have signed up to a three-year deal with an onshore wind power company? Mr Edwards: No, that was a purely commercial decision.

Q187 Mr Jones: Yes sure, but it does damage your independence somewhat, does it not? Mr Edwards: Yes, I think it is fair to say that. I will acknowledge that, sir, yes.

Q188 Mr Jones: How is onshore wind superior to other forms of renewable energy, and you might as well add into that offshore wind as well? Mr Edwards: Superior is a difficult concept, a difficult word. It is the most readily available, it is a technology that is understood, and it can be deployed at a fairly technically large scale. It is not necessarily a superior technology; it is the one that is most available in order to meet the 2010 target. Offshore wind has a number of technical problems and, quite frankly, the cost is significantly higher. In the longer term looking towards the 2020 target, yes, I believe that much larger scale deployment of offshore wind turbines will be possible. One of the technological barriers at the moment is depth of water. At the moment ten to 15 metres depth of water is about the
most readily achievable technologically. However a lot of research and time is going into looking at much deeper areas.

Q189 Mr Jones: You can show us your remaining independence, Mr Edwards, by telling us the problems with wind power. 

Mr Edwards: There are not any! No. The problem really is that the deployment of larger scale wind turbines does occupy quite a large area of land. Spatially although less than 1% of the total land area looking round the border of a wind farm is taken up by the turbines, they are big and some people do not like them. I think one of the major drawbacks is that they are big. Wind is not an urban technology. Other forms of generation—gas turbines and, by and large, large power stations—are urban technologies and they sit into an urban environment. Wind does not sit easily into an urban environment for a number of technical reasons. One is the turbulence caused by buildings and also because of the sheer size and scale of them. You can deploy them on a smaller scale in an urban environment but to get that large deployment you need large areas of uninterrupted wind flow and those naturally occur in a rural environment. They do have some effects on the ecology. They require careful planning. Most of the ecological impacts can be mitigated by careful siting. The other issue that is often cited is noise and again, inappropriately sited, they can produce a noise nuisance. However, if industry guidelines and proper noise assessment is carried out, noise is not the issue that it was in the early days of wind turbine development. Significant technological improvement has taken place to wind turbines specifically to make them quieter. I think that in a nutshell is the drawback.

Q190 Mr Jones: You missed a main one which is of course they are intermittent. You are not going to close down any traditional power stations at all. 

Mr Edwards: According to the latest figures, for a 10% deployment of wind it would require something like 6% to 8% of the wind capacity as back-up. It is a very complex subject but the latest research that has been carried out I believe by Manchester Institute of Technology shows that up to 10% on a grid system would require something like 6% of the wind capacity as back up because it is highly unlikely that across the country you would get all the wind turbines shut down all at the same time.

Q191 Mr Jones: Right, but it is possible? 

Mr Edwards: It is highly unlikely.

Q192 Mr Jones: That is what they said about the Titanic sinking, Mr Edwards! Can I just move on. I think we have established that industrial wind farms have a problem. You touched on the urban use of wind but you are still thinking industrially. What about smaller turbines on every household in Wales? I know you cannot put them on them all because some of them are blocked off from wind, but that would generate probably more than we are even envisaging at the moment in realistic terms. 

Mr Edwards: But how acceptable would that be to the planning system because of the visual impact of it? 

Q193 Mr Jones: Change the planning system. There is obviously a lot less visual impact than 200-foot high turbines in our most beautiful areas, if I might say so. If I can move on now. How much of Wales’s electricity/heat is currently produced by wind technology? 

Mr Edwards: As a percentage I am not sure. The most recent figure I could get was there are 235 megawatts of installed capacity across Wales.

Q194 Mr Jones: And how much would that need to increase to meet the 2010 renewables target? 

Mr Edwards: The Welsh Assembly target is 800 megawatts by 2010, so it is an increase by 560 megawatts.

Q195 Mr Jones: Okay, do we have any figures? You mentioned 235 megawatts. Is that 2005? Do you know when that figure relates to? 

Mr Edwards: That is the latest figure I got yesterday from the British Wind Energy Association who do keep good records.

Mr Jones: That is fine, thank you.

Q196 Chairman: Could I follow up on one of these questions in relation to industrial or urban wind farms. You have not referred to the impact on leisure and tourism. I have a particular interest coming from where I come from in the South Wales Valleys where we are emerging after our industrial past and in my constituency of Aberavon it is envisaged through TAN8 that nearly 40% of all new wind farms would be in that area from the Aman Valley across to the Rhondda. It will have quite a significant impact on leisure. What is your observation on that? 

Mr Edwards: I live in mid Wales and again we are quite dependent on tourism, particularly, for want of a better word, “green” tourism. People come to Mid Wales for leisure activities like mountain biking and walking. We have got a fairly high density of wind farms in the Mid Wales area and a lot of development in the 1990s/early 2000s. It certainly does not appear to have affected tourism. I think if you look at the mountain bike industry in Machynlleth it has grown remarkably. It generates a lot of income for the town. That has started since the opening of the wind farms adjacent to Dyfi Valley. I personally do not think from what I have observed in my own home town there has been any negative impact on tourism because of the construction of wind farms in the area.

Q197 Chairman: You are not suggesting that the mountain bikers are coming there because of the wind farms? 

Mr Edwards: No.
Q198 Chairman: It sounded like that.
Mr Edwards: I apologise for that. What I am saying is that the mountain bike industry has grown up following the introduction of wind turbines and certainly research that has been done UK-wide into the impact on tourism does not indicate that wind farms, for instance in Cornwall, have substantially affected tourism or even at a local level there has been any discernable change in the number of visitors, for instance to the north Cornish coast, since wind farms were built in that area.

Q199 Chairman: So the logic of your argument is that we should not worry at all about them being in the Brecon Beacons National Park or on the Pembrokeshire coastline or in Snowdonia National Park?
Mr Edwards: No, I did not say that. I value the wild places of Wales as much as anybody. I am a keen mountain walker. Wind turbines have no place in national parks. That is my personal opinion and I think the planning policy is correct there. They have got no place in national parks.

Q200 Chairman: So those of us who value the beauty of the South Wales Valleys should begin a campaign for a national park or an area of outstanding natural beauty then?
Mr Edwards: Yes, if you are opposed to wind turbines.
Chairman: I did not say that but it is a good idea, I will take that from you then!

Q201 Nia Griffith: Could I just pick that up. Supposing the planning things were sorted out, would you see a lot more potential for micro generation?
Mr Edwards: Yes. I think both businesses and individuals are becoming much more aware of the imperatives of climate change, and I think people are willing to put their hands in their pockets. The problem at the moment (because they are low-volume technologies) is that the costs of production are quite high. Small wind turbines, PV, is very, very expensive and you have to be a fairly rich household. Even with a grant, you have to be in a fairly high income bracket to be able to afford it. I think if production could come down and with some subsidy, yes, I think people are willing to.

Q202 Nia Griffith: And put them on buildings and things?
Mr Edwards: Yes, it adds very little. For instance, the obvious technology, solar thermal/solar water heating, could provide more than half the domestic hot water requirement in the UK if there was some sort of imperative on developers, for instance as they have in the Netherlands where for new developments a lot of the local authorities have said x% of the houses will have to have a southerly aspect so that PV and solar thermal can be deployed either now or in the future. Those are very simple measures that do not cost very much which can have an effect.

Q203 Jessica Morden: You talk in your evidence about the poor history of planning consent between 1999 and 2003. Can you give us a sense of how many applications were made in Wales in comparison with following the introduction of wind turbines and how many were made in the UK and expand a bit on that?
Mr Edwards: Yes I can. I did a bit more research on that yesterday afternoon. I have got the figures now. The up-to-date figures are slightly different for 2000 to 2005. For Scotland there were 54 decisions and 71% were granted. For Wales there were 24 decisions and 42% were granted. In England there were 55 decisions and 67% were granted. In Northern Ireland there were five decisions and 100% were granted. I am quite happy to write that down and send it to the Committee Secretary.

Q204 Jessica Morden: And do you want to expand on this disparity?
Mr Edwards: I think Scotland had a very robust planning policy towards renewables. It was the first of the national governments across the UK to come out with planning guidance and it was very, very strongly in favour of renewable energy. England came next. PPS22 pre-dated TAN8 and I think because it was out in the consultation phase it then became material to the planning, not as material as obviously when it had been adopted but right from the consultation phase it was material and therefore planning committees were taking cognisance particularly of the greater weighting given the need for the development over the local impacts and I think that is part of the reason. I think part of the reason goes back to the apparent public opposition to wind farms in Wales which is still not borne out by public opinion surveys and it is a bit of paradox still. I think those are the two reasons for that period 2002–05.

Q205 Mr Crabb: In your written submission you mention “the unfavourable economics of biomass in electricity production”. Can you explain that a bit more, please?
Mr Edwards: Because of the capital costs of plants, the cost of fuel, it is very difficult to generate electricity that can compete. Even with the support of the Renewables Obligation Certificate it is very difficult to produce electricity that is able to compete in an open market for electricity. I think it is as simple as that. However, things are changing. The market price of electricity over the past couple of years has been very low. In response to rising fossil fuel costs, that is changing. The bulk price of electricity has gone up. I am not sure of the percentage but it has gone up dramatically over the last 12 months. I wrote this in December and that was basically on last year’s perceived wisdom. I would hesitate to say it, but at the moment if you had a look at it you would find it was converging to the market price for electricity and hence making biomass more attractive.

Q206 Mr Crabb: Do you see much else on the horizon other than electricity price, including perhaps technology, that might make biomass more economically viable in the future?
Mr Edwards: Yes, the big trick with getting biomass to work is to find a use for the heat. Basically, as in any thermal generation system, you are throwing away about two-thirds of the energy you have got. For instance, in biomass you are throwing two-thirds of the energy in the wood away as heat. If you can find an economical use, ideally for all of that but even part of it, it becomes a lot more viable. District heating up until now has not really been viable because of the relatively low cost of oil and gas. However, we heard in the last couple of days that British Gas are probably going to be putting their prices up by 25% in 2006. That will certainly make the biomass industry go back to its sums again and see how viable district heat networks are becoming. I think that is probably the biggest breakthrough, and not in technology. I think the biggest breakthrough is going to be in the use of the heat and examining where the biomass power plants are situated. If you can situate them adjacent or very close to a large industrial heat user, as indeed has happened in one example in Wales and I am aware of two others that are being looked at quite seriously where there is a big heat load adjacent to a potential biomass scheme, I think that will be the first breakthrough.

Q207 Mr Crabb: Do you know how much of Wales’s electricity and heat is currently produced by biomass technology?  
Mr Edwards: No. Electricity—very little, if any. As far as I know at the moment, there are no electricity generating plants. It is very, very difficult to quantify what Wales’s heat needs are. All I will say on this is from other own observations within our biomass business we are getting a huge increase in very, very serious interest in biomass heating technology.

Q208 Mr Crabb: Is there a difference, do you think, between biomass for electricity and biomass for heat? Is there a risk that the emphasis on electricity rather than heat has closed the eyes of the policy-makers to the local economic benefits of wood fuelled biomass in particular?  
Mr Edwards: Unequivocally, yes.

Q209 Nia Griffith: Can we move on to hydro. Have you got any ideas of, first of all, the percentage level of energy that is currently produced by hydro and how much is it envisaged this might be able to increase perhaps under the Renewables Obligation?  
Mr Edwards: I am sorry I do not have the figures at my fingertips on the percentage of energy that is produced but I did have a think about this last night and I think you have got differentiate between things like the Dinorwig scheme, which is effectively pump storage therefore it is using more energy than it is producing. It is a balancing mechanism to secure, if you like, greenfield generation. There are very few large-scale pure generation plants in Wales. Npower have one in Dalgarroag and a number of satellite stations in Snowdonia and there is the tidal scheme run by E.ON. I guess those amount to about 50 megawatts together. There are a number of smaller schemes and I think the opportunity for Wales here is with the smaller schemes. There are very few schemes of greater than one megawatt available in Wales that are technologically possible to engineer and environmentally acceptable. However, there are a large number of schemes certainly in the 100 to 300 and possibly the 200 to 500 range, in that medium range. The estimate that was put in the study carried out in 2001 at about 20 megawatts I think is probably a reasonable estimate of the new exploitable hydro. There is another scale which is very interesting and again almost unquantifiable and that is the small, domestic, single on-farm hydro schemes in the ten to 100 kilowatt range. Wales has a long history of using water power in rural areas. It is something that I know in my area farmers are very keen on doing.

Q210 Nia Griffith: How would you see the way forward with that? What do we need to do to make it happen?  
Mr Edwards: I think the conditions are quite favourable. I did mention in my submission that there have been problems in the past with the Environment Agency and the Precautionary Principle. However ourselves and the British Hydro Association have worked very productively with the Environment Agency and there has been quite a meeting of minds and it is now relatively easy to get an abstraction licence providing you understand the restrictions that the Environment Agency are going to put on that and you select a site where you still have an economic scheme with restrictions on the amount of water you can abstract. The planning policy and planning arena is generally favourable to small hydro. I think one area for the very small hydro schemes where there is a grant available is through the DTI Clear Skies programme, but it is quite small. On a personal note, I was offered £5,000 if I were to exploit a hydro for my own house and the commercial cost would have been about £60,000, so it is not a huge contribution. There are some interesting schemes coming along in North Wales under Objective 1 to support local landowners in the construction of hydro schemes with quite a large capital subsidy. I think there is evidence that that is kickstarting that market. I think the only thing is greater access of good quality, independent information to landowners on how they can develop their own hydro resources.

Q211 Mr Jones: Can we move on now to photovoltaics. We have not spoken about those yet. The DTI have brought out some funding support but it seems to be quite short term and aimed at larger projects. How do you think that is going to affect the use of photovoltaics on a wider basis in Wales?  
Mr Edwards: The various PV support streams over the past three years have seen a dramatic increase. They have had a very profound effect to such an extent that at the moment it is quite difficult to buy PV panels. However, the last stream is coming on, I believe, in March 2006, so we are looking at the end of the support programme. It has increased the uptake and it has forced down the price of PV panels. However, the market has flipped otherwise and now there is a scarcity of PV panels which inevitably will push the price up. What happens next I am not sure. I understand that it is going to be subsumed into a
micro generation support policy. The Welsh Assembly is looking at this independently at the moment. I do not know. We have done some work for OCTO in setting out, if you like, the roadmap of where the Welsh Assembly ought to be going, but I am not sure exactly where that support mechanism is going. I think if the support mechanism is taken away completely it will fall flat. I do not think the industry is strong enough to be competitive against other technologies without support, and that is not just in Wales, that is UK and Europe.

Q212 Mr Jones: But it is to be hoped that will improve as the price of photovoltaics comes down?

Mr Edwards: Yes.

Q213 Mr Jones: We have spoken about wind biomass, hydroelectricity and photovoltaics. What other areas have you looked at as a company? I am thinking particularly about deep-drill geo-thermal technology.

Mr Edwards: We have not looked at geo-thermal. The area we are looking at at the moment and trying to work out, to be blunt, where our commercial niche can be is in marine technologies—tidal and marine current turbines—and particularly the regulatory environmental impact of them, which as yet really is unknown. I think Wales is well-placed to become quite an authority. We have some very exciting schemes happening in South Wales. We also have two universities whose skills and experience in marine biology are world renowned. That is Aberystwyth and Bangor. We are already talking to Aberystwyth and Bangor to see how we can link our expertise, and I think other Welsh companies are doing it as well. For Wales, I think marine technologies are the ones that will offer a future. I certainly hope the Welsh Assembly would support that. It is going to require support. They are technologies that are not commercially proven. There are a number of technical problems and no doubt there will be a number of environmental problems that nobody has realised.

Mr Jones: Thank you.

Q214 Chairman: Thank you very much for your evidence and for your memorandum. If you feel that there is additional information that you would like to share with us in a further memorandum we would be very pleased to receive it, particularly on the last point you were making.

Mr Edwards: Thank you very much.
Tuesday 28 February 2006

Members present:

Dr Hywel Francis, in the Chair

David T C Davies  Mr David Jones
Nia Griffith  Jessica Morden
Mrs Siân C James  Mark Williams

Written Evidence from RWE npower

INTRODUCTION

1. RWE npower, part of the RWE Group, is one of the UK’s largest energy suppliers and we have a diverse portfolio of over 8000MW of generation capacity in the UK, including some 1700MW in Wales. We sell our expertise in power generation in key markets and are one of the UK’s leading renewable energy developers and operators.

2. In Wales, we currently operate the 1500MW Aberthaw coal-fired power station, 192MW of renewables generation, two combined heat and power plants and are seeking Section 36 consent for 2000MW of gas-fired capacity at Pembroke. Aberthaw directly employs 265 staff and spends over £30 million per year on local goods and services. It is uniquely designed to burn low-volatile coal, such as that from the South Wales coal fields. It currently consumes 2.4–3.0 million tonnes of coal per year, of which a third can be supplied locally. The current investment in Flue Gas Desulphurisation (FGD) will allow it to continue to operate at similar levels of output for the next 10 years.

3. npower renewables is a wholly owned subsidiary of RWE npower and is a major developer and operator of renewable energy projects in Wales including: six onshore wind farms; North Hoyle, the UK’s first commercial offshore wind farm, situated off the coast of Rhyl and five hydroelectric stations in North Wales. We have been active in wind power in Wales since early 1990s but have been operating Cwm Dyli and Dolgarrog hydro power stations in North Wales for 100 years (through former operating companies). We have offices in Dolgarrog where we employ 33 staff and our eight wind operations and maintenance staff for England and Wales are based in Llanidloes and Tonyrefail. We are also in the process of opening an office in Swansea for our onshore wind development team. npower cogen is a wholly subsidiary of RWE npower and is a UK leader in industrial CHP, with two plants in Wales.

4. As a major energy company in Wales, we welcome the opportunity to contribute to the Committee’s inquiry into energy in Wales. We have addressed those areas of the Committee’s inquiry to which we believe we can usefully contribute.

UK GOVERNMENT POLICY: CURRENT AND FUTURE ENERGY NEEDS AND ENERGY PROVISION IN WALES

5. We recently contributed to the Welsh Assembly’s consultation on the Energy Wales Route Map and we were generally supportive of its aims. We address below the current hurdles and barriers to be overcome in order to secure the future provision of energy, to meet Wales’ own energy needs in a sustainable manner in line with UK Government policy.

6. Renewables

In order to meet the Welsh Assembly targets for renewable energy generation of 4TWh of renewable energy by 2010 and an aspirational target of 7TWh by 2020, the following issues need to be addressed:

Technical Advice Note 8: Planning for Renewable Energy

7. We believe that the previous Planning Policy for Wales did not allow planning authorities to adequately weigh the national need for renewables against local impacts. Technical Advice Note 8 (TAN 8) states that 800MW of additional onshore capacity will be needed to meet the 2010 targets. TAN 8 identifies seven Strategic Search Areas (SSAs) for major wind farm development and states that these areas have a potential capacity of 1120MW. Whilst we welcome and support the publication of TAN 8 and are encouraged by the general approach we do have five specific concerns:

(a) Local Authorities are expected to undertake a lot of work to “achieve a finer grain of development allocation in the SSA, taking into account landscape, visual and cumulative impacts”. This will inevitably take time and could delay decision-making.
(b) There is not much “spare” capacity between the target and potential, so large areas of the SSA must not be precluded from development by these additional Local Authority reviews.

(c) Progress in terms of achieving the targets needs to be monitored regularly by the Welsh Assembly and action taken if the targets are not going to be met.

(d) The targets are viewed as a maximum/cut off point rather than a minimum which could lead to proposals being refused when the targets have been met.

(e) We would strongly urge ministers to include generation targets for technologies other than onshore wind. RWE npower believes that new small hydro should not be neglected as a valuable additional source of renewable electricity. Although the potential for hydro development in Wales is modest, hydro-electric generation provides an important element of diversity in Wales’ renewable energy resources. Hydro capacity can also provide electricity for the long term: the life of an individual scheme, once constructed, can be practically indefinite if it is appropriately maintained. We therefore believe that it would be appropriate to include a reference to new hydro as well as wind in the setting of targets. From estimates we understand that the potential for further hydro development in Wales to be around 100MW. On this basis we would suggest that an additional 20MW of hydro capacity in Wales would be feasible by 2010. Most of this capacity is likely to be relatively small run-of-river schemes which would not involve large impoundments.

Public Opinion

8. The biggest barrier to development and investment for wind in particular still remains difficulty with planning consent both in Wales and across the UK. RWE npower supports any initiative to promote public understanding of the issues.

Grid and Transmission issues

9. The securing of timely consents for grid connections is a critical issue for the expediency and viability of project development in order to deliver the short term targets for renewable deployment. Another critical issue for both onshore and offshore wind is the need for and cost of the grid connections and infrastructure upgrades and who will pay. Wales would benefit from a process and a mechanism for upgrading the grid with clarity on the cost of delivery.

10. Wales would also greatly benefit from a more strategic approach to connection issues. Currently MANWEB and Western Power are responding to renewable development needs on an individual project by project basis which potentially escalates expense in the long run. The management of grid queues is an area where Ofgem is making some progress but there is a need for more urgency in addressing this issue. The final sums liabilities issues also need to be resolved or this will delay and hinder the grid consenting process and will result in the failure of TAN 8 to deliver within the targeted period (2010).

11. Conventional Generation

As mentioned above, npower’s Aberthaw power station is a major feature of the Welsh energy market with firm links with South Wales mining; FGD investment in progress; planned turbine efficiency investments and a system security role.

12. Our proposed Combined Cycle Gas Turbine (CCGT) power station at Pembroke would add new, high efficiency fossil-fuelled plant and we have Combined Heat and Power (CHP) schemes at Dow Corning and Georgia Pacific in South/Mid Glamorgan. Pembroke will be a major contribution to system infrastructure and security in South Wales should it be allowed to proceed. CHP plants are examples of both energy/carbon saving and security of supply measures since power is generally consumed on site with less burden placed on the transmission networks. In addition, dependent on site configurations, should the network go down CHP plants can maintain system operation at local level. Additional support from the Assembly to encourage the UK Government to provide clarity on the long-term future for the Climate Change Levy, and the associated exemptions for Good Quality CHP, would be welcome. The confidence of CHP developers and users in planning for future investments needs to be addressed in order to help increase the uptake of this low carbon technology.

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1 Final Sums Liabilities are levied by network companies on parties who terminate grid connection agreements prior to them taking up the connection. When working properly, they are an effective method of discouraging speculative connection applications. Recent changes by the National Grid Company have created problems that are effecting all developers. The issues relate to transparency of the system employed and the fact that grouping projects together has caused projects to be threatened with liabilities that are several times the value of the project.
The Current and Future Portfolio of Energy Provision in Wales

13. Clean coal technology

We are pleased to see that the strategic importance of Aberthaw is recognised and we are committed to abating emissions from the site but the Welsh Assembly’s continuing support will be valuable in ensuring that the power station continues to be regulated appropriately. We have nominated a representative to participate in the Assembly’s coal planning TAN and look forward to assisting in that work. Of particular concern to us is the possibility that opportunities to extend the productive life of the Welsh coal field could be frustrated by changes in the planning regime for coal mines. Having invested massively in the future of Aberthaw, through FGD and other improvements, we would not wish to see the supply of locally-mined coal dry up, forcing us to increase imports from around the world.

14. At European level our parent company, RWE, is involved in a range of schemes costing several hundred million euros to develop clean coal generation involving: high temperature materials development; carbon capture; and virtually flue gas free coal and gas plants.

15. Wind Farms

As discussed above, in terms of TAN 8, it is hoped that the Assembly will be able to support the Authorities that need to undertake additional work to refine the boundaries of the “Strategic Search Areas”, in terms of resources and expertise. This will enable them to complete this work within a reasonable timescale. npower renewables would also welcome the opportunity to contribute towards any working group or debate on how community benefits from major renewables projects can be realised.

16. In the longer term, offshore wind farms in Wales present the potential for supporting the clean, low-carbon and more competitive energy future for Wales. There is potential for putting Wales in a leading position in the UK market. This can be achieved by continued development of Round 1 Projects such as North Hoyle and Rhyl Flats and the early realisation of Gwynt y Môr but will require the continued support and commitment from the Welsh Assembly through the planning and consenting process.

17. Biomass Energy

The needs of the biomass heat market also need to be addressed. ROCs and LECs are available for the electricity generated, but there is currently no incentive on developers to maximise the efficiency of renewable fuel use through the supply of heat.

18. Tidal and Wave Energy

RWE npower believes that marine (wave and tidal) energy systems could become a significant source of renewable generation in the future. As such we support a resource assessment and environmental evaluation, which will help ensure that Wales makes the best use of its potential marine energy resources.

19. It is well recognised that wave and tidal stream technologies are still in their infancy, with many different concepts being developed and only a limited number that have prototyped. Therefore we also support the notion of pre-commercial demonstration projects, to help bridge the gap between R&D and commercialisation. However we believe that if this sector is to become a credible source of electricity generation, it is essential that power generation companies become involved in these projects, and therefore that the right structures and incentives are in place to facilitate this.

20. We note that the current marine support mechanism only supports tidal stream and wave. There is potential for tidal range (lagoon and barrage) projects around the Welsh coast, but these would require financial support. We are committed to exploring this potential and as a first step would urge the Welsh Development Agency to consider the provision of a Tidehub facility off Anglesey which could potentially put Wales at the forefront of tidal stream development in the UK.

21. Hydro electric energy

RWE npower believes that new small-scale hydro should not be neglected as a valuable additional source of renewable electricity. Although the potential for hydro development is modest, hydro-electric generation provides an important element of diversity in Wales’ renewable energy resources. Hydro capacity can also provide electricity for the long-term: the life of an individual scheme, once constructed, can be practically indefinite if it is appropriately maintained.

22. From various estimates we understand that the potential for further hydro development in Wales to be around 100MW. On this basis we would suggest that an additional 20MW of hydro capacity in Wales would be feasible by 2010. Most of this capacity would be likely to be in the form of relatively small run-of-river schemes which would not involve large impoundments.
23. A barrier to the full contribution of hydro is that the Environment Agency in Wales currently restricts the abstractions for hydro schemes to a level where they can be uneconomic without additional grants from the Welsh Development Agency. In Scotland and some parts of England, the regulatory bodies are more constructive, allowing small hydro to be viable simply with the support offered by the Renewables Obligation. We support the Cabinet Office’s work in formulating a consistent approach across England and Wales, but we are keen to see this implemented in order to re-start hydro development within Wales.

24. **Liquefied Natural Gas**

The proposed Pembroke project includes the provision of high-pressure gas pipeline from the new NTS pipeline on north side of Milford Haven waterway to the south side, which would have the capacity to serve third parties as well as Pembroke CCGT.

25. **Energy Efficiency**

Industry is being encouraged to review energy usage through a range of economic and regulatory mechanisms. RWE npower aims to actively support its major customers, understand their energy consumption and actively manage energy usage. In this respect, we are working with our customers to undertake energy audits, review their energy metering and develop energy management systems. Recognising the strong link between energy and environmental considerations, we are also planning to share our expertise in carbon management, corporate social responsibility, environmental management systems and environmental audit with our larger business customers.

26. npower plays a major role in improving the energy efficiency of residential properties in Wales. In partnership with Warm Wales, npower offers an holistic approach to the alleviation of fuel poverty—through the integration of energy efficiency advice, benefits advice and the provision of energy efficiency measures. Working in the Borough of Neath and Port Talbot we have commenced a three-year programme that aims to offer every household, regardless of income and tenure, assistance towards energy efficiency improvements. npower are supporting the project by providing funding for the installation of energy efficiency measures as part of npower’s Energy Efficiency Commitment (EEC). It is anticipated that npower’s funding will be in the region of £9 million over the three-year period. A similar scheme has recently been launched in partnership with Warm Wales and Wrexham Borough Council, offering energy efficiency improvements and funding representing a significant commitment.

27. Currently, npower is awaiting the outcome of a bid to manage and implement the Welsh HEES (Home Energy Efficiency Scheme). Again, in partnership with Warm Wales, npower and Transco have committed significant resources and funding to achieve the Welsh Assembly’s objective to reduce fuel poverty and deliver energy saving measures to the most deprived areas in a targeted manner. If successful we look forward to integrating Welsh HEES with other Welsh Assembly initiatives.

25 January 2006

Written Evidence from Falck Renewables Limited

1. **Introduction**

1.1 Falck Renewables is pleased to be given the opportunity to submit evidence to the Welsh Affairs Committee for its Inquiry into Energy in Wales. Falck Renewables is a company currently involved exclusively in the European wind energy business and our evidence will therefore focus on this element of the energy mix. Our response to the enquiry will specifically address the following aspects of the stated terms of reference of the inquiry:

1b. UK Government policy in relation to the current and future provision of energy in Wales.

2. The relationship between the UK Government and the National Assembly for Wales—including the division of powers—on energy policy.

3d. The current and future portfolio of energy provision in Wales (specifically relating to) wind farms.

1.2 Falck Renewables is headquartered in London. It is the wind energy subsidiary of the Falck Group which has its headquarters in Milan, Italy. The Falck Group is a privately owned company, which has recently celebrated its centenary. The Group’s business is focused on green energy including wind energy, biomass and waste to energy. Falck Renewables and its sister company Actelios form the environmental and renewable energy division of the Falck Group.
1.3 Falck is creating a portfolio of wind energy projects across Europe, focusing on the UK, Italy, Spain and France. All our projects are being developed in partnership with local developers and other stakeholders. This approach is important in ensuring that we understand local issues and that we consult effectively with local communities and stakeholders. Falck’s aim is to become the long term owner operator of a portfolio of wind projects across Europe.

1.4 Falck currently owns and operates 160MW of wind projects which are in operation or construction. This includes our share of the 99MW La Muela project and the 23MW Cabezo San Roque project both of which are located in the region of Aragon in Spain. In the UK we own the 58.5MW Cefn Croes project, which is the largest onshore wind project in Wales, and we are currently constructing a 14MW project at Boyndie airfield in Aberdeenshire and the 37.5MW Earlsburn project near Stirling. We have an additional 290MW of consented projects in Scotland and Italy which are due to commence construction during 2006–07 and over 400MW of additional wind farms in an advanced stage of development across the UK, Italy, and Spain.

1.5 Falck has worked in partnership with RDC, who are based in Mold in North Wales, on all of its UK projects. RDC have extensive experience of developing wind projects over the past 10 years, particularly in Wales, having been involved in 40% of the consented projects in Wales to date.

1.6 Falck hopes to develop further wind projects in Wales, building on the successful completion of construction of the Cefn Croes windfarm in March 2005. We are currently part of a consortium that is seeking to develop wind projects in the Strategic Search Areas identified in TAN8. The Consortium submitted a response to the Pre-qualification process for the National Forest Estate Wind Farm Programme in January.

2. The Relationship Between the UK Government and the National Assembly for Wales

2.1 We are aware that there has been some debate and discussion about whether responsibilities in relation to Section 36 and 37 of the Electricity Act 1989 should be devolved to the Welsh Assembly Government as has been the case in Scotland. We would be supportive of powers being transferred to the Welsh Assembly but we would urge that any such change should be done in a way that minimises delays to considering Section 36 and 37 applications and helps achieve the Welsh Assembly Government’s ambitious targets of 4TWh per annum of renewable energy production by 2010 and 7TWh by 2020.

2.2 We note that the current volume of Section 36 applications in Scotland has stretched resources at the Scottish Executive and other statutory consultees leading to delays in determining applications and this should be considered in this debate with the expected imminent large number of planning applications following the publication of the revised Technical Advice Note 8 (TAN8).

3. Energy Policy and the Contribution from Wind Energy

3.1 This is an important time for UK Energy Policy with a substantial national and international debate currently taking place which will help shape energy policy for the next generation. The debate is driven by the twin objectives of reducing emissions of greenhouse gases from power stations and adapting to reducing reserves of fossil fuel. One of the key considerations for the UK, and Wales as part of an integrated UK electricity network, is security of supply which has historically been achieved by a mixed portfolio of generating sources.

3.2 The last Energy White Paper provided significant support for renewable energy, setting progressive targets for the growth of renewable energy out to 2020. This approach was an important part of the Government’s commitment to tackle climate change and was consistent with EU policy. The growth of the contribution of renewable energy in the UK energy mix will also improve the overall security of electricity supplies in the UK.

3.3 We hope that the current debate on UK Energy Policy will endorse and strengthen the targets for renewable energy, as we believe that renewable energy must make a major contribution towards the future UK generation mix in order to meet the twin objectives of tackling climate change and adapting to reducing reserves of fossil fuels.

3.4 Renewable energy generally needs to be located where the renewable resource is available. Wales, like other parts of the west coast of the UK, including Scotland, has a large renewable resource, particularly an excellent wind resource. If the objective of sustained growth of renewable energy in the UK is to be achieved then it is vital that these renewable resources are fully utilised.

3.5 The achievement of the 2010 renewable energy target will rely heavily on the onshore wind sector. The publication of TAN 8 in July 2005 demonstrates the Welsh Assembly Government’s commitment to this target by concluding that an additional 800MW of onshore wind energy generation should be sited in Wales.

3.6 We believe that there are two main hurdles to the wind industry’s ability to deliver 800MW of additional generating capacity in Wales by 2010.

(a) Electrical infrastructure strengthening.

(b) Public perception of wind energy.
3.7 Energy infrastructure strengthening is stated as a priority action in a recent consultation document, “Energy Wales: Route Map to a Clean, Low Carbon and More Competitive Energy Future for Wales”, but we believe swift action is required to advance the major strategic investments required to provide the electrical grid infrastructure in Mid and North Wales to facilitate the connection of renewable energy projects. At present there is virtually no spare grid capacity in mid Wales and very little in North Wales.

3.8 This process is already underway in Scotland, with significant expenditure approved by OFGEM to reinforce the transmission network and interconnector. Such a situation does not yet exist in Wales. Major grid reinforcement works will typically take at least five years to plan, permit and construct. However, this process cannot start without the distribution and transmission companies (Utilities) receiving approval for new investments from OFGEM. We see a significant role for government to facilitate discussions between OFGEM, Utilities and potential generators to commence the reinforcement process as soon as possible.

3.9 Numerous public attitude surveys have shown that the majority of people in the UK are in favour of wind energy. One such survey, commissioned by the British Wind Energy Association (BWEA) as part of their “Embrace the Revolution” campaign in Wales was announced at the official opening of the Cefn Croes wind farm in June 2005. This survey revealed that 75% of the people in Wales believe that wind farms are necessary to help the country meet its current and future energy needs. Further, polling by BBC Wales’ “Dragon’s Eye” in November 2005 also pointed to a favourable reaction to land based wind production. However, wind farm applications continue to be met with objections from small but well organised and vocal minority groups, invariably causing delay.

3.10 With the publication of TAN 8, and the identification of Strategic Search Areas, there is a danger that the communities within or nearby the Strategic Search Areas may become concerned about the focusing of large-scale developments. This will be a challenge for the National Assembly, the Local Authorities concerned and the wind industry—but it is a challenge which must be met. We strongly believe in public consultation and engagement with local communities throughout the development process, but it is important that Government maintain their public support for renewable energy to help ensure the success of the aims of TAN8.

4. THE CHALLENGE OF SUCCESSFUL DEVELOPMENT OF WIND PROJECTS

4.1 As we have indicated in the introduction, Falck Renewables has significant recent experience in developing, constructing and operating windfarms in the UK and other European countries. We would like to draw the Committee’s attention to some of our experiences which we believe are relevant to consideration of how to help further deployment of wind projects.

4.2 Falck Renewables is developing a number of projects in Scotland with RDC. On most of these projects we are offering the local community an opportunity to invest in our windfarms. We are doing this through an agreement with Energy4All who will set up and manage a Co-operative for each project. Individuals can invest between £250 and £20,000 in the Co-op which will use the money to purchase a minority share of the windfarm. Each investor in the Co-op becomes a part owner of the Co-op and the investment is expected to earn an attractive return over the life of the project. This model for community ownership and investment in windfarms is becoming quite well known within the industry (although there are few implemented schemes to date) and attractive to local communities take a direct interest in windfarms and to help improve public understanding and acceptance of windfarms. To help achieve this Energy4All encourages each Co-operative to act as a focus for environmental and educational initiatives in its local area. Energy4All are soon to launch the investment prospectus for our Boyndie windfarm and we understand that there is a lot of local enthusiasm and interest in this opportunity.

4.3 Our consortium, with whom we are working to develop projects in the TAN8 Strategic Search Areas, has reached agreement with Energy4All to offer this same investment opportunity in Wales and we expect that this will have a similarly positive effect.

4.4 We are involved with another community initiative at our Earlsburn project near Stirling. On this project a local community group called Fintry Renewable Energy Enterprise (FREE) has been successful in obtaining planning permission for a wind turbine directly adjacent to our 14 turbine project. We have provided some support to FREE through the permitting process and we have subsequently reached agreement to build, and operate their turbine as part of our windfarm. The agreement enabled FREE to take advantage of our economies of scale and technical skills. FREE expects to realise a significant annual income, which they intend to use to fund local community projects particularly to do with domestic energy saving measures for Fintry residents. This initiative has helped create a very positive community view and support towards our windfarm.

4.5 A number of our projects involve schemes to mitigate the impact of the windfarm on the local ecology or ornithology. At our Earlsburn project we have reached agreement with Stirling Council, SNH and RSPB to create an alternative habitat for certain birds that may be displaced by the windfarm. This involves felling part of a nearby commercial forest to create a heather moorland habitat that is favoured by hen harriers and some open deciduous woodland which is favoured by black grouse.
4.6 At Cefn Croes we have funded a long term plan to restore the natural habitat of the site which has been eroded by commercial forestry and intensive agriculture. The Plan was devised and will be managed together with the Welsh Assembly, the Forestry Commission, ADAS, CCW, RSPB and Ceredigion Council. There has been some adverse publicity about the impact of the construction of Cefn Croes on the local environment and so it is important that people should know that this plan exists and that the result will be to restore and improve the local habitat over the life of the project.

4.7 At all of our UK projects we offer a community benefit fund. At Cefn Croes we are contributing £58,500 per year to a trust fund which will be administered by five trustees of whom four trustees are members of the local community. It is the intention that the main beneficiaries of the fund will be the local communities of Pontarfynach and Blaenrheidol. We hope that this money will contribute to worthwhile local causes, particularly to local education.

4.8 We are always very happy to arrange visits to our windfarms and we have hosted around 20 visits to Cefn Croes in the past year. It is gratifying for us that visitors are consistently impressed by the windfarm. Visitors often comment on how quiet the turbines are and how well the windfarm fits within the landscape. The windfarm is located in a remote upland plateau and as a result it is not particularly visible from local residential areas. Some visitors therefore comment on the fact that they didn’t realise that such a big windfarm was there.

4.9 The construction of the windfarm infrastructure was a major civil engineering task, which was carried out by Jones Brothers of Ruthin, working in partnership with the Forestry Commission on the design of the new access tracks. Some adverse comments and pictures were circulated at the time by local opposition to the project alleging significant damage to the ecology of the site. It is notable that one year after the end of construction and now that restoration work is largely complete, vegetation is growing back quickly in the track verges and around the turbine bases, with clear signs of a green sward over these areas. Large areas of peat disturbed by construction have now been rewetted. Unfortunately we sometimes find that the local press tend to take a negative stance towards Cefn Croes. While we welcome discussion and debate we find that site visits are the best way of helping people make up their own minds based on first hand experience.

4.10 On the subject of Jones Brothers, we endeavour to use local contractors wherever possible on our projects. On the two projects we are currently constructing in Scotland we are using local contractors to do both civil and electrical project work. We have also arranged open days on all our projects for potential local contractors to identify themselves to us so that we can use their services for a range of activities including hire of vehicles, site canteen, fencing work etc. At Cefn Croes the daily operation and maintenance of the windfarm is currently carried out by GE Wind Energy. They have employed five full time staff to operate and maintain the windfarm, and all of their staff lives locally to the windfarm. We believe that these initiatives to use local contractors and to employ local staff help the local economy and contribute towards improved perception of wind energy.

4.11 Falck Renewables also have experience of developing wind projects in Italy, Spain and France and we would be happy to discuss our experience of these markets with the Committee.

28 February 2006

Witnesses: Dr Mark Legerton, Development Manager for Wales, RWE npower, Dr John McElroy, Head of Environmental Strategy, RWE npower, Mr William Heller, Managing Director, Falck Renewables Limited and Mr Roger Jones, Asset Manager, Falck Renewables Limited, gave evidence.

Q215 Chairman: Good morning, and welcome to the Welsh Affairs Committee. Could I ask you, first of all, to introduce yourselves, please?
Mr Jones: I am Roger Jones from Falck Renewables, I am their Asset Manager, I look after the operation of the wind farms that Falck own.
Mr Heller: I am William Heller, I am Managing Director of Falck Renewables.
Dr Legerton: Good morning, I am Mark Legerton, the Development Manager for Wales from npower renewables.
Dr McElroy: Good morning, I am John McElroy from the Generation and Renewables Division within RWE npower where I am Head of Environmental Strategy.

Q216 Chairman: Could I ask you to raise your voices a little, do not be afraid to shout and project yourselves. Could I begin by asking you to provide some background about npower and Falck Renewables and remind us of the sites that you manage in Wales?
Dr McElroy: If I can start for RWE npower, RWE npower is the largest electricity generator in Wales and we have interests in coal plants, in combined heat and power, in wind generation, hydro and biomass and we currently employ around 360 staff directly in our various facilities in Wales. We have been active in Wales for around 100 years with the hydro business and we currently have about 1700 megawatts of capacity. We are currently investing about £150 million in our coal-fired plant at Aberthaw where we are fitting Flue Gas Desulphurisation equipment and also making significant efficiency improvements to the plant, and we are also planning to invest in a new combined cycle gas turbine plant at Pembroke which is around 2000 megawatts of capacity. For us, obviously, with these developments both in fossil capacity and also...
in renewables, the whole planning process in Wales is quite important to us going forward. The alternative is that we pursue options elsewhere. Certainly we see Wales as important in the energy mix in the UK going forward and we want to see Wales contribute to security of supply, to diversity and to the environmental objectives of having a sustainable energy future.

**Q217 Chairman:** You are going to give us all the evidence and we will not need to ask any questions, so could you just pause there for a moment and could we ask Falck Renewables to talk to us about your sites?

**Mr Heller:** Falck Renewables is exclusively a wind company. We are headquartered in London, we operate in the UK, Italy, Spain and France, we currently have 160 megawatts either operating or in construction, and we have the largest onshore wind farm in Wales which is Cefn Croes, which is also our largest wind farm. In addition to that we have another 290 megawatts of consented projects in the United Kingdom and in Italy and have a development pipeline of over 400 megawatts in Europe.

**Q218 Chairman:** Thank you for that. What percentage of Wales’ and the UK’s electricity is currently generated from wind?

**Dr Legerton:** I can answer for Wales, perhaps, that there is about 315 megawatts of wind capacity in Wales, and if one assumes that that operates with a 27% capacity factor, that should generate something around 744 gigawatt hours a year. If one assumes that about 40 terrawatt hours are generated in Wales by all sources each year, that represents 1.86% of what is generated and I believe in Wales the energy consumption is approximately half the generation, so you can double that up to something like 3.6% for the percentage of the consumption in Wales that is generated by wind power.

**Q219 Chairman:** How much is it envisaged that this will have to increase in Wales and the UK in order to meet the 2010 renewable energy targets?

**Dr Legerton:** Starting again with Wales, the Assembly has already identified that there is about 1.4 terrawatt hours coming from renewables at present within Wales and clearly the target for 2010 is four terrawatt hours, so there are 2.6 terrawatt hours to be made up. What has been worked out is that that would equate to about 1000 megawatts of additional capacity, and clearly the Assembly expects about 800 megawatts of that capacity to come from onshore wind. You can scale that up for the UK as a whole when looking at a 10% target for the UK.

**Q220 Chairman:** This is a question again for npower, in paragraph 16 of your written evidence you say that wind energy has the “potential for putting Wales in a leading position in the UK market.” Would you say in practice this would benefit the people and the communities of Wales? I know that is a very large question, but could you give us some practical examples of how we could benefit?

**Dr Legerton:** Wind energy is an opportunity for communities where wind farms are sited and there is a lot of general acceptance that wind energy has a very positive role to play in our energy needs going forward, but your question relates, quite rightly, to what do local communities get out of it. Developers are made very much aware of the need to consult closely and work with local communities to bring very direct and local benefits to the communities working around wind farms, and certainly the Assembly has not been shy in making that point very clear when expressing its planning guidelines through TAN8 and also through the Forestry Commission where there is a lot of activity expected in the future. One of their three criteria on how they will assess the tenders which come into them is what are the local community benefits that will arise from those projects, so there is a great deal of attention and pressure put on developers to make sure that those local benefits do arise.

**Q221 Nia Griffith:** Can I ask if any of our witnesses have got involvement in micro-generation, that form of community involvement with wind power?

**Dr McElroy:** Within our retail business we are looking at opportunities for micro-generation. I have to say that at the moment it is pretty early days in many respects because those technologies are fairly expensive, and in many respects the consumer interest is not there. A major issue going forward is how we raise consumer interest in micro-generation technologies; we believe that they are part of the overall package in terms of addressing the energy needs going forward and it is certainly our intention to play our part in that.

**Q222 Mark Williams:** Notwithstanding that I respect what you have said about community involvement and consultation with local communities, how do you as companies respond argument-wise, not in terms of the procedures involved, to the perception that parts of Wales in particular are now looking over-saturated with wind farms of varying sizes?

**Dr Legerton:** The approach taken in TAN8 is to some extent acknowledging that there is going to be a concentration on wind farms in particular areas, and I guess it is a degree of judgment and a point of view whether you consider that an over-saturation or not, but it is a clear policy direction of the Assembly to concentrate large-scale wind farms in seven areas throughout Wales. There are two sides to that, I guess, in that some areas are going to be left relatively free from wind farm development and others are, by necessity, going to see a concentration of wind farm development. I do not think there is any way of getting round that, it is then up to developers to try and site the sites as carefully and as sensitively as they can within those areas to minimise the impacts on local communities.
Q223 Chairman: This is a hypothetical question: if the scale of the opposition is such in many of those areas would you envisage a situation where people would say the environmental cost is not that great so why do we not actually begin to think about campaigning to locate wind turbines in Areas of Outstanding Natural Beauty or National Parks or even on Ministry of Defence land, or is that an unfair question?

Dr Legerton: I do not think it is unfair; it is the role of the planning system to direct development to the most appropriate locations and, speaking personally, I think it is right that there are some parts of the United Kingdom which are protected from development such as National Parks and Areas of Outstanding Natural Beauty.

Q224 Chairman: Why do you think that should be?

Dr Legerton: It is important to reserve some of the United Kingdom as areas which are less developed, be it from wind farms or any other form of development, because people do benefit from having the locations to get away to, to benefit from the more peaceful and tranquil areas of the countryside, I do myself.

Chairman: We will come back to that later on.

Jessica Morden.

Q225 Jessica Morden: How is wind energy superior to other forms of renewable energy?

Dr McElroy: I would say that like all forms of energy, renewable technologies each have pros and cons. I would say at this stage, if you are looking at the support mechanisms for renewable energy in the UK, obviously a key element in terms of wind technology is its price in terms of being compatible with the mechanisms and also its stage of development. Lots of other renewable technologies are still at early stages of their development and need pump-priming, so it is a mix of attributes which results in a particular technology being favoured at the moment; that is not to say that other technologies cannot and will not emerge over the next decade or so, and we would be keen to see that happen.

Q226 Jessica Morden: Is there anything that you would like to add to that?

Mr Heller: Yes, at present wind power, particularly on the west coast of the United Kingdom, is a very attractive resource. If we compare it to the fact that it is early days in new technologies such as wave, wave technology is a very attractive future development but it is probably three times as expensive to build as wind for about the same yield. That will improve over time, but at present wind is the most economic by quite a distance over virtually every other renewable source.

Q227 Jessica Morden: Are there special conditions that make the Welsh coast and wild lands particularly favourable to both onshore and offshore wind?

Dr Legerton: Starting with offshore wind, there is clearly a good wind resource off the Welsh coast compared to perhaps the east coast and there are also relatively good opportunities for grid connection, particularly in North Wales and, again, in North Wales there are no particularly significant environmental issues. On the east coast of the UK you historically have more military activity looking eastwards towards the old Soviet Union from the Cold War so there is a preponderance of military radar on the east coast which we do not have so much in the west, and there are less navigation issues perhaps on the west coast rather than in the English Channel and the North Sea. Having said all that, it is true to say that only three out of the original 18 round one offshore sites were within Welsh waters and only one of the 15 round two sites are in Welsh waters, so despite all that there is a fairly even spread of offshore wind energy around the UK. A lot of similar arguments apply to onshore; it is wind resource, also combined with relatively sparse populations in areas which have that good wind resource, so it is possible to site wind farms of a reasonable size a good distance away from nearby residents, which you do not get in some other parts of the country.

Q228 Jessica Morden: Can you explain how exactly does wind energy contribute to a reduction in carbon emissions?

Dr McElroy: If I could pick up on that point, ultimately wind energy is carbon-free at the point of generation so the issue in terms of the carbon benefits depend on what it is displacing in the energy mix at that point in time, and that obviously depends on fuel prices in the market, whether gas is at the margin or coal is at the margin, so in terms of carbon benefit it will vary with time. If we are talking about coal-fired generation you are talking about roughly 0.9 tonnes per megawatt hour whereas it is around 0.4 for CCGT.

Q229 David Davies: Just a short question, is it not fair to say that wind energy will only contribute to carbon emissions if it replaces a carbon-emitting technology? In other words, if you looked at other energy-producing technologies which do not produce carbon but they have other disadvantages, wind energy has no advantage over them in that sense. It does not actually reduce carbon emissions, it merely allows you to reduce other forms of energy production.

Dr McElroy: I agree with you to a certain extent, but at the end of the day the question you have to ask is what would be generating the electricity if the wind was not there. Whilst, obviously, nuclear runs at base load, the wind output is variable, so the issue is what in fact is wind actually displacing in the system at the time?

Q230 Mark Williams: Thank you, that leads on very nicely to my next question. What are the daily targets for energy generation at Cefn Croes and North Hoyle and, perhaps more fundamental to the debate, are those targets being met?
Mr Jones: If I could talk about Cefn Croes, in terms of daily targets you cannot look at a daily target because in terms of the load factor at the site it is more windy generally in the winter than it is in the summer, so the profile is generally that we expect more output in the winter than in the summer. In terms of a load factor, we would expect a load factor between around 32% and 36% at Cefn Croes, but we have not had a full year’s output yet because the scheme only came on line last April. If you look at the load factor through the winter from October to February, the load factor was 35.8% and in February, for example, until the 26th of the month the load factor was 41%, so it shows that we are having the output during the winter period.

Q234 Mark Williams: You mentioned seven to eight months and you were talking almost in theoretical terms there. In the case of Cefn Croes are we there at the moment, are we at that crunch period, the cut-off point?

Mr Jones: I have not done the calculation in terms of looking at what the manufacturing contribution would be.

Q235 Mark Williams: Would that be something you as a company would look into as a matter of course? I am thinking, quite frankly, in terms of the public relations of this as well; would you be looking into that, would you have the research capacity to do that sort of thing as a company?

Mr Jones: We know that the BWEA have researched the issue and that is the outcome of the research that the BWEA have done. We have accepted that research.

Q236 Mark Williams: What is the pay back time for North Hoyle?

Dr Legerton: It is.

Q237 Mark Williams: If you could get into the load factor for North Hoyle has been 35% when measured from November 1994 to November 1995, which are the last available confirmed figures, and that does meet the expectations which we had for the project when it was built.

Mr Jones: Yes.

Dr Legerton: It is a similar answer for North Hoyle really. We do not have daily budget figures, we do have monthly budget figures and, just as for Cefn Croes, they vary throughout the seasons with midwinter months producing approximately twice the summer months. Averaged over the year, the load factor for North Hoyle has been 35% when measured from November 1994 to November 1995, which are the last available confirmed figures, and that does meet the expectations which we had for the project when it was built.

Q238 Mrs James: Further to the question from my colleague from Ceredigion, there appears to be a considerable discrepancy in the information that I have read between capacity and output. It has been suggested in some of the things I have read that the actual costs are much higher than the current figures suggest. What were the costs per kilowatt of energy produced at Cefn Croes and North Hoyle in the past year in comparison to other forms of energy?

Dr Legerton: The cost of energy of any project is dependent upon a whole host of factors but, mainly, how much it cost to build the project in the first place, how much energy it produces and what rate of return or interest, in effect, the investors want to have back on the money which they borrowed from them to build it in the first place. Without tying
down those three factors, it is quite difficult to give a
cost of energy for any particular project, but all
projects that are built under renewable obligations
will be limited to the amount of worth in their output
by the price of conventional electricity, plus the
benefits which they receive from the renewable
obligation, so over time that is probably something
around 7p per kilowatt hour. Any project being built
today is probably producing for less than that and
possibly on good sites with good wind resources it
would be less still, I expect it would be.

Q239 Mrs James: Are you frontloading costs in
effect, so do you expect that cost to get
correspondingly less as time goes on, when you
actually pay off the debt to the bank and
development costs are taken into consideration?

Dr Legerton: Most of our costs are upfront when we
build the wind farm, and then the operation and
maintenance costs are fairly small-scale in
comparison over the lifetime of the wind farm, so
you could look at it that after a period of perhaps ten
years we would have paid off the capital on the wind
farm and the costs of producing that energy then are
much reduced. There is more money in the project
then from the value of electricity which can then be
sold, assuming that the value of the electricity is
compares to what it is today.

Mr Heller: Our project at Cefn Croes is a little bit
different, we are under an old scheme, the NFFO
scheme, so we have a fixed price that we are allowed
to sell at which is 4.9p per kilowatt hour which is
actually well below current wholesale market prices
which last week were around £65 to £70. It is a bit of
a unique project, it is the last of those very large
NFFO contracts that have been completed.

Mrs James: Thank you.

Q240 David Davies: You have mentioned a figure
there of about 7p per kilowatt hour which is in line
with what the Royal Academy of Engineering
estimated as the production costs of wind power.
They also estimate—and their estimates tally so far
with the reality—that the cost of nuclear power is
about 2.3p including decommissioning: how can you
justify an energy source—if I can play devil’s advocate—with all due respect, that is more than
twice, nearly three times the price?

Dr McElroy: You have to be very cautious about
pence per kilowatt hour energy costs. At the end of
the day, depending on the project life that you
choose to take and the discount rate that you choose
to apply you can come up with a very large number
or a very small number. At the end of the day the
only way to compare is to understand the capital
cost structure and to understand the revenue cost
structure, and that is both the fixed and variable
costs. I am afraid that unless you have that
information, it is very easy to mislead.

Q241 David Davies: I do not, but the Royal
Academy of Engineering, I would have thought,
have done their sums fairly carefully.

Dr McElroy: I would have to suggest that if nuclear
power were 2.5p per kilowatt hour—

Q242 David Davies: 2.3p.

Dr McElroy: Which is the number you suggested,
then I am surprised that there is not more interest in
building the technology at the moment.

Q243 Mrs James: Much of that information would
be commercially sensitive, I presume, anyway.

Dr McElroy: Absolutely, yes.

Q244 Mr Jones: We have touched briefly on this but
Friends of the Earth suggest that recent proposals
for the construction of wind farms could result in
Wales obtaining as much as 27% of its electricity
demand from about 2012; is that something that is
consistent with your estimation of the position?

Mr Heller: In terms of the 27% we believe it is
achievable from various sources, primarily from
wind farms, and the estimates are that wind power
could probably supply approximately 20% without
any significant increase in costs to the system of
absorbing an intermittent source. Then there are a
whole host of other technologies coming along. The
27% is probably achievable; wind, with a significant
investment required beyond 20% so we will probably
keep it limited to 20% or below and the other sources
can make up the rest.

Q245 Mr Jones: I would like to raise with you the
question of the intermittent nature of the wind which
is self-evident. Is there, in your view, an upper safe
limit that we should be looking at in terms of wind
generation? The Government appears to be working
on a figure of 26 gigawatts but there is other evidence
which we have seen which tends to indicate, for
example, that Germany and Denmark are
suggesting 10 gigawatts. What are your views about
these figures?

Mr Heller: The DTI together with the Carbon Trust
did a pretty expansive study on this and concluded
that up to 20% their quote was “very modest
associated costs” with adding that to the existing
UK system, which is significantly more than what we have
and is well within the target, so the target of 2015 of
15% can be met at this very modest cost.

Q246 Mr Jones: Yes, but how does that stack up with
the German and the Danish evidence?

Dr McElroy: You are talking about two things, you
are talking about capacity and energy, and I think
we have got to be careful that we do not confuse
them. I think the other thing you have got to
consider is the size of the electricity system in
Denmark which is quite a lot smaller than in the UK
and the size of the electricity system in Germany
which is very much larger, so absolute numbers do
not tell us a lot in themselves, you have to look at the
percentage of supply in the system rather than the
capacity. The numbers in that area suggest that
certainly for the UK grid system 15% has a very
minimal impact in terms of effect on the stability of
the system.

Q247 Mr Jones: I am interested in the intermittent
point because, as I understand it, when the wind
does not blow hard enough or it blows too hard the
turbines simply do not generate electricity, so presumably there has to be a back-up to take over the load when the wind stops blowing; is that correct?

Dr McElroy: Yes, there will have to be other capacity on the system and one of the issues in terms of the UK is what the level of diversity is in the energy mix going forward. Certainly, yes, there would have to be back-up capacity which at the moment would be coal, gas or oil.

Q248 Mr Jones: Conventional sources of generation.

Dr McElroy: Yes, conventional sources of generation.

Q249 Mr Jones: Presumably it is the case therefore that these conventional power stations are still operating when the wind turbines are turning, is that right, so that they can back up the energy in times of need?

Dr McElroy: That depends on how the plant is operating. A coal plant, for instance, or an oil plant can be brought up to meet system requirements pretty quickly, particularly if a coal plant is in a warm condition, but an oil plant can typically respond to needs in the market very quickly and that plant is not running all the time. That is obviously an issue for the National Grid to manage and make certain that that capacity is there when the system needs it.

Q250 Mr Jones: Just so the Committee fully understands this, it is the case therefore that conventional power stations, coal-fired or whatever, are operating at the same time that the turbines are turning, so to that extent there is not a full saving of capacity by the turbines.

Dr Legerton: If I could just add to this, if you get to large installed capacities of wind on the system, perhaps 13,000 to 15,000 megawatts—perhaps 10% of UK supply—then there is an additional requirement for back-up, but that back-up is quite small compared to the wind which is then available, so it has been estimated to be about 700 megawatts. The extra back-up required, therefore, is a very small part of the additional capacity which you are bringing on from wind and hence a very small part of the carbon emissions which you are offsetting. Certainly, today, with the relatively low penetrations of wind energy, the requirements for additional back-up are next to negligible and it is only when we get to sizeable percentages that it becomes anything that is at all measurable, and even then it is a very small percentage of what has been displaced.

Q251 Mr Jones: I was not actually talking in terms of extra value, I was talking in terms of conventional power stations that are running whilst the wind is blowing.

Dr Legerton: I think you have hit the nail on the head there.

Q252 Mr Jones: Is it indeed the case that those power stations are still running whilst the wind is turning the turbines?

Dr Legerton: Those power stations are running anyway because we need back-up for a whole host of situations which can arise such as Sizewell B tripping out, a sudden rise in demand for electricity, so that back-up capacity is there whether we have wind or not. Wind can draw on that, just the same as a fault in a nuclear power station or a sudden demand for domestic electricity.

Q253 Mr Jones: But that is the position anyway, is it not?

Mr Heller: That is the way the system works anyhow.

Q254 David Davies: As I understand what you are saying, the amount of wind energy going into the system at the moment is so small and irrelevant that it does not particularly need a back-up system, but if it increases to the sorts of levels which are being suggested then it will need a back-up system and, presumably, managing the grid is about managing peak demands, but peak demands are not always going to come at a time when the wind happens to be blowing at the right speed, so there is bound to be a need for additional generators to be built and they will have to be running. Presumably if they are running at 5% to 7% of their capacity then that in itself is not particularly efficient.

Dr Legerton: If you have the time, a visit to the National Grid headquarters in Wokingham would be a very valuable exercise for you, as I am sure they can explain the management of quite a complex grid system a lot better than I would hope to do. Going back to where we were, the additional back-up capacity required for the UK being supplied by 10% of wind energy is only a few hundred megawatts and the cost implications of that are measured in fractions of pence per kilowatt hour, so it is not the issue which it is sometimes made out to be. I recommend a conversation with or a trip to the National Grid Company who will be able to give you the full works.

Q256 Nia Griffith: If we can move on now to planning issues, in giving evidence to the Committee here the DTI referred to two different ways of getting planning applications approved, and we would really like to know what your comment is on the
system where you go through the DTI or you go through the Welsh Assembly. What has been your experience up to date?

Dr Legerton: Onshore or offshore or both, because they are different?

Q257 Nia Griffith: If you can comment on both, that would be very helpful.

Dr Legerton: Onshore, if a project is less than 50 megawatts, it goes through the local authority and above 50 megawatts it goes to the DTI under section 36 of the Electricity Act. The planning regulations and guidance which the project is being assessed against are the same in both cases, they are the same planning policies which the DTI will take into account as the local authority will do, and if the local authority do not support the project it would go to a public inquiry in any event, so it is very important to us, even for a section 36 project, to work with the local authority in trying to convince them of the merits of the project. In reality, there is very little difference in terms of the work we have to do to try and work with local people, irrespective of which route we go down. Of course, when you go offshore the Town and Country Planning Act does not apply and, whilst you still have the section 36 route for offshore projects, you also have the Transport and Works Act which is the other alternative, but I think it is becoming more and more common practice for developers to use the section 36 route, particularly given some modifications which have recently been made to that; that is likely to be the main approach for future projects going forward. It also has the advantage that it allows the developer to work with the local authority for the onshore works, because all offshore wind farms do have an onshore element and by going to section 36 route we can work with the local authorities on the onshore elements as well.

Q258 Nia Griffith: In your experience how is the interface between the DTI and the National Assembly for Wales working?

Dr Legerton: Our only experience is through our offshore projects in Wales, we have not had any 50 megawatt plus projects ourselves as yet, and that seemed to work perfectly fine. I think they had a good exchange of opinion and information and consulted well with each other during the application process.

Q259 Nia Griffith: If I could refer now to Falck, in paragraphs 2.1 and 2.2 of your submission you refer to devolution of responsibilities under section 36 and 37 of the Electricity Act 1989 to the National Assembly of Wales. Can you tell us why you would support that and what impact that might have on planning procedures?

Mr Heller: The reason that we would be supportive is trying to keep the decisions as close as possible to where the actual activity will take place, so we believe that the Welsh Assembly is perfectly capable of handling those, although we do have a concern in terms of if there was going to be a handover taking place we would like that to be as smooth as possible so that delays are not created merely in the process of devolving those powers from Westminster to the Welsh Assembly.

Q260 Mr Jones: On that particular point is there not, however, a concern that what we are talking about is a major strategic national resource, and therefore ought it not to be the case that the DTI actually has overall control of a large scale wind farm application?

Mr Heller: I am not certain that they would need to have overall control, I think there is a national policy of which the perspective is that it should be devolved to all the regions and each region should be making a contribution to the overall goals. So there is a co-ordination role for the DTI to play, there is a strategic role, but if it is the expectation that every area of the United Kingdom should be doing something in the area of renewables it is then reasonable to devolve those decision-making powers down to a more local level.

Q261 Mr Jones: But you would accept that there is a strategic role for the DTI?

Mr Heller: Absolutely.

Q262 Mark Williams: Can I just ask one very quick factual question of Falck first before I ask my main question? Are there two functioning power stations at Cefn Croes owned by Falck, or is it just the one, which has a bearing on the issue of over 50 megawatts and the planning process. The capacity at Cefn Croes is 45 megawatts and New Werfa 13½; are those both owned by Falck?

Mr Heller: It is a single project. There are two NFFO contracts, a NFFO 3 and a NFFO 4 and they are at different prices to make sure that we could not have a spill over from one NFFO to another these are connected to the grid completely separately. It is one single farm with 39 machines, but two separate connections because there are two separate NFFO contracts.

Q263 Mark Williams: And they are both managed by yourselves?

Mr Heller: Oh yes.

Q264 Mark Williams: Thank you very much, that clarifies a local concern. What are your views of the National Assembly of Wales TAN8 planning guidelines, how effective do you think those guidelines are and perhaps both companies can tell the Committee if in fact you have responded to invitations from the Forestry Commission to issue tenders in the suggestion?

Mr Heller: It is a little bit difficult for me to comment because we were just informed on Friday afternoon that our group did not pre-qualify. It is very interesting because we do not really understand why we received a two sentence reply in the e-mail saying thank you for submitting, you do not pre-qualify, despite the fact that our group has Jones Brothers, a world-class civil contractor from Wales, the largest developer in Wales, RDC, General Electric, International Power, one of the world’s largest
independent power producers so, quite frankly, as I said, this first step is a little bit baffling to us as to why this consortium did not get pre-qualified. I can understand later if we did not win a project, but not to be qualified to participate is baffling.

**Q265 Mark Williams:** What are your more general views on the planning guidelines of TAN8, what are the views of both companies on those?

**Dr Legerton:** TAN8 has been welcomed by the wind industry in general as being a very proactive and positive message going forward. There is still a bit of work to be done with the local authorities refining those boundaries and we have some key messages that we need to get across in that process to make sure that is not done a little too hastily and throwing away some of the good work which has been done in drawing up TAN8. I know, for example, in Conwy some of the area which has been allocated as part of their attainment of the targets is not available for wind farm development because the landowner is just not interested; similarly, in Powys some of the land allocated had been excluded through the TAN8 process because of the low-flying concerns, so there is a bit of consultation still to be done with the MoD. There are still some details to sort out, therefore, but the general principles and targets set prove to be very beneficial in terms of getting local authorities thinking about where wind can be accommodated in their areas, and we are hoping to win some of those sites off the Forestry Commission as well.

**Q266 Mark Williams:** You have not heard yet.

**Dr Legerton:** We have heard yes.

**Mr Heller:** Can I add to this that there is a concern in terms of reaching those goals, the goals are appropriate and they will get to the targets if all 800 onshore megawatts are built; however, there is a concern in terms of the electrical infrastructure. There is very little grid capacity left in North Wales, there is virtually none available in Mid Wales and the process for approving and then adding additional grid capacity is a very long and involved process, up to five years. It requires Ofgem to approve the transmission and distribution companies to build those transmission facilities, which has not been granted yet because developers have not been awarded any planning consents, so therefore they basically cannot book the capacity and pay their standby reservation fees for those capacities to get built.

**Q267 Mark Williams:** In the short term are we reaching saturation point, which is back to the point I was making at the start of the proceedings?

**Mr Heller:** In the short term in Mid Wales, as I said, the system is pretty much saturated and North Wales is not terribly far behind.

**Dr Legerton:** The purpose of TAN8 was to allow a more strategic approach, and part of that strategic approach is trying to work with the grid companies to make sure that this strengthening happens at a time which meets the demands of developers. All developers have concerns that there is a lot of work to be done to get that grid strengthening in place in time for the projects.

**David Davies:** Once again you have a knack of answering my questions; unless there are any other problems that you have identified with the national grid structure, but if you have already mentioned them I do not want to delay the Committee unnecessarily.

**Q268 Mr Jones:** Returning to that point, that is a particular concern of mine, but both of you in your submissions to the Committee have identified the problems with the national grid infrastructure in Wales, and I think in fact it was Falck that indicated that major grid reinforcement works would typically take at least five years to plan, permit and construct. If that be the case, is it not rather putting the cart before the horse by developing the TAN8 sites at this stage until such time as the infrastructure has been put in, because how are you going to distribute the energy that is generated by the turbines on those sites?

**Mr Heller:** You need to do both things simultaneously, because the grid will not get approval for reinforcement by Ofgem until the projects are actually defined, so delaying the process of identifying the projects under TAN8 will merely exacerbate the problem. The structure is Ofgem will only approve the grid upgrading if the developers have the projects and are willing to put down the deposits to get the transmission system actually built.

**Q269 Mr Jones:** It is chicken and egg.

**Mr Heller:** Yes, exactly.

**Q270 Mr Jones:** To what extent are Ofgem addressing this at the moment because they must be aware of the proposals with TAN8?

**Mr Heller:** I am not sure what they are doing, I am more familiar with what they are doing in Scotland where they have approved some of the upgrades—two major upgrades have been approved in Scotland so that the power from the north of Scotland can be brought to the Borders area. Something very similar is going to have to happen, I think, in terms of co-ordination between Ofgem, the Welsh Assembly, the developers and the distribution companies, they are going to have to basically address that problem and solve it.

**Q271 Mr Jones:** Is the infrastructure capacity in place for Gwynty y Mor?

**Dr Legerton:** It is not in place today but there are applications being prepared for that infrastructure to be put in place and there is sufficient capacity on the high voltage system to absorb the output from Gwynty y Mor, there are just some local works that need to be done to connect into the high voltage system.

**Q272 David Davies:** Falck have referred to a survey by Dragon’s Eye which said that 75% of the population in Wales believe that wind farms are
Chairman: Are you familiar with the geography of his constituency and the visibility of those wind turbines in relation to where he lives?

Dr Legerton: There are some views of the Ffynnon Oer wind farm from within his constituency.

Chairman: Where he lives I said?

Dr Legerton: Not from his particular dwelling, perhaps not, but I am not sure that was the question.

Chairman: Are you familiar with the geography of his constituency and the visibility of those wind turbines in relation to where he lives?

Dr Legerton: Among the general public, where there are survey results to shed some light on that question, it might be surprising but actual support for wind energy increases in areas where wind farms have been built and I suspect that is partly because people see the reality of the situation rather than have the fear of the unknown and having to go on other people’s word for what may or may not happen. It is still possible to find principled politicians who support wind farm developments in their own backyards as well as other people.

Q276 Chairman: Are you familiar with the geography of his constituency and the visibility of those wind turbines in relation to where he lives?

Dr Legerton: There are some views of the Ffynnon Oer wind farm from within his constituency.

Q277 Chairman: Where he lives I said?

Dr Legerton: Not from his particular dwelling, perhaps not, but I am not sure that was the question.

Q278 David Davies: In fairness I thought from your answer that perhaps there was one sited directly in his constituency, not somewhere off into the distance. To be fair, just give me a name to satisfy this whimsical line of questioning of a Member of Parliament who has actually got one in his constituency and who has been willing to come out and support it?

Dr Legerton: Under those criteria Peter Hain still applies, and I have not been to all the MPs’ houses to know who can see a wind farm from their back garden.

Q279 David Davies: A Member of Parliament who represents a constituency in which a wind farm has been sited, or a Member of the Welsh Assembly?

Dr Legerton: Peter Hain still applies, he has a wind farm within his constituency.

Q280 David Davies: Actually within his constituency.

Dr Legerton: Yes.

Mrs James: Which I can see from my constituency.

Q281 David Davies: Anyone else? Are there any other examples in the UK? Your public relations department must be keen to find Members of Parliament and Welsh Assembly Members or whatever who would support a wind farm in their constituency.

Dr Legerton: I can tell you Michael Howard was not.

David Davies: I can think of many who were not, I am trying to find a few who were.

Mrs James: With all due respect, the one that is in Peter Hain’s constituency is actually visible from my constituency and, I think, from parts of yours, Chairman, from certain viewpoints—Skewen.

Chairman: We are into the realms of speculation now, but it would be good if we did actually ask the Secretary of State to come and give evidence. It is unfair to be quoting him, although it is on the record that he has made these statements; it is not on the record, however, but rumour has it that he has—it is unfair to say this—actually said to people in the village of Resolven that the wind farm will not be visible in Resolven but it will be visible to people who live in my constituency, so there is this kind of nimbyism going around, or reverse nimbyism. We had better finish there and ask the Secretary of State to come to give evidence.

Mr Jones: Perhaps before we leave that point, Chairman, if we are inviting the Secretary of State we could also invite the Prime Minister to attend before the Committee and explain his attitude towards the proposed Trimdon Grange turbine.
Q282 Mark Williams: I do not want to be accused of nimbysim. I know that on this Committee we are delving into issues particularly about the capacity of wind power to respond to legitimate targets, but how do you respond to the Wildland Network’s comments—and this is particularly pertinent to my constituency and other rural areas, I declare an interest there—that the siting should be limited to industrial sites and there should be a presumption against wind turbines in rural locations? You said at the start that there should be large tracts of the country—and I put it much wider than you would—available for leisure and quality time, peace and tranquillity so should there be a presumption against wind turbines in rural locations? How do you respond to that comment?

Dr Legerton: If we want to see a significant amount of our electricity generated from wind energy then confining it to brownfield and industrial locations would prevent that from happening. As someone who has a great interest in wildlife myself I think you have to look at the wider picture and think of the effects on climate change and what effect that is going to have on habitats and wildlife throughout the world and make a balanced judgment that there is a case for carefully siting wind farms in the countryside, having properly assessed the effects on wildlife and making sure you do all you can to mitigate those effects but still get the benefits from those wind farms in terms of climate change reduction and the habitat protection that that will provide.

Mr Heller: I do not have much to add, other than there are other organisations, Friends of the Earth and Greenpeace, who do agree that carefully selected rural locations are appropriate for wind developments, and also point out that if you are limited to industrial areas you are, one, limited to a small amount of land and two, you will probably be in very close proximity to large numbers of dwellings and so then you have the balance between locating near cities and large numbers of people or are you out in the country. There is a balance that needs to be maintained.

Q283 Mark Williams: Notwithstanding that wind farms have a life expectancy of about 25 years, in the genesis of the wind farm story are there instances of redundant wind farms now being returned back to the way they were that you can think of, and what is the potential for that? I appreciate that at Cefn Croes attempts have been made to do some remedial work there but more generally?

Dr Legerton: You mean after the wind farm has completed its usefulness?

Q284 Mark Williams: Yes.

Dr Legerton: We are still so early in our wind farm development days. Probably the first one went in in December 1991 and that is still going strong today so we have not gone full cycle yet in any of our wind farms in the UK.

Mr Heller: There is a financial obligation on all wind farms to have the money put aside in terms of a bond, a trust or an account to restore the land to as it was beforehand. We all have that obligation to decommission and the decommissioning of a wind farm is far less complicated or expensive than decommissioning nuclear or fossil fuel plants.

Q285 Mr Jones: The Committee has received a large number of objections to the proposed Gwynt y Mor wind farm which, just to put it in context, I believe will be one of the biggest offshore wind farms in the world. It would be upwards of 200 turbines, each over 500 feet high. Most of the objections are in terms of visual impact, quite clearly, because it would be just off a very intensely and highly populated coast. If it were possible to put the turbines further out to sea so that they would not be visible from the coast, those objections would disappear. Would it be possible technically and otherwise to site the turbines further out to sea so that they would not be visible from the coast?

Dr Legerton: I am afraid I am going to disappoint you in saying it would not be. If you go any further off the coast of north Wales, you run into an area that is very heavily used for shipping and navigation and oil and gas exploration. Added to that, you increase the cost of energy from that wind farm and then you start to call into question the economics of offshore wind energy the further offshore you go. Those are two very real, physical constraints on going any further offshore.

Q286 Mr Jones: Theoretically, is there any reason apart from that why the wind farms could not be further out to sea or do they have to be in reasonable proximity to a land mass?

Dr Legerton: There is no reason in principle why you could not build further out to sea. Water depth becomes an additional factor and the deeper the water the higher the construction costs. The further the distance from the shore the higher the cabling costs to afford the grid connection. It is a cost issue rather than a “cannot be done” issue. It depends in part how much the consumer would be willing to pay for electricity from offshore.

Q287 Jessica Morden: This is a question for Falck about community engagement. You talk in your submission about how you engage with local communities. Could you explain a bit more about that and, in particular, the Co-op investment scheme you have where local communities can invest in wind farms?

Mr Jones: If we talk about Cefn Croes first, there is a community trust that has been set up. Falck will pay £58,500 a year into the trust and that money will be managed by five trustees. I am a trustee. There are two trustees from each of the community councils at Pontarfynach and Blaenheidol. We are in the process at the moment of registering the trust as a charity and in the coming months we will be looking to spend the money and allocate the funds. That process has been going on since the wind farm was commissioned and the money is available now to
spend. We are just putting the process in place to make sure we can comply with the charity legislation.

Q288 Jessica Morden: Has it been well received? What kind of things will you spend the money on?  
Mr Jones: In terms of being well received, we are having meetings with the two community councils at the end of the month to launch the trust. The types of things that we are spending the money on are educational, public amenities and leisure activities. We are looking for the ideas to come from the local communities. Rather than the trustees saying, “This is where the money will be spent” the projects will be submitted by the community and the trustees will decide how to allocate the funds to the projects that have been put forward.

Mr Heller: We also have a programme called the Land Management Plan where we put £10,000 a year into it and the objective is to restore the land and improve it over what it was when we first started the project, an area of intense commercial forestry and agriculture. The idea is to try and improve the project site and make it better than it was before we even began the project. That is separate funding.

Q289 Jessica Morden: In the evidence we have had from the Wales TUC, they stated that of all the renewable sources wind technology is also likely to produce the most jobs in the immediate future if the manufacture of wind turbines is carried out in Wales. Can I ask where the wind turbines for North Hoyle and Cefn Croes were manufactured?  
Mr Heller: The Cefn Croes turbines were manufactured in Germany. There were no turbine manufacturers in Wales. As a matter of fact, the tower manufacturer, Cambrian Engineering was established and had financial difficulties for a number of years before it ultimately failed. They were getting very little business because of the stop-start nature of development in Wales and did most of their business exporting out of Wales but ultimately that business failed.

Q290 Jessica Morden: Nobody manufactures wind turbines in Wales?  
Mr Heller: No.

Q291 Jessica Morden: There are no plans in the future that you are aware of?  
Mr Heller: None that I know of.

Q292 Jessica Morden: Should it be granted planning permission, where will the wind turbines for Gwynt y Mor be manufactured? In Germany?  
Dr Legerton: It is EU procurement law that we will have to go out to tender for that project. It would be impossible for me to say who will supply the turbines because it depends on the results of that open tender as to who is best placed to meet those demands. I would hope however that Welsh manufacturing has a strong role to play even if it is not in the turbine supply itself but in supplying components for these wind turbines. Being local to the project gives them some commercial advantage in doing their own tenders to those suppliers. There is a lot of scope for Welsh supply but we cannot categorically say it would be from this company at this stage.

Q293 Jessica Morden: Would you agree with the Wales TUC that local employment predictions should be a key part of the planning consents and in the generation of planning consents?  
Dr Legerton: We have included estimations of local employment and UK employment in the Gwynt y Mor application. I am not sure that I would agree it should be part of the planning determination or not. I would have to give that more thought. I think it is perhaps straying from one issue to another. There is definitely a role to play in using renewables to bring economic development but how closely that should be linked to planning consent needs consideration.

Q294 Mark Williams: How many jobs in North Hoyle and Cefn Croes are there, running the projects? What is the employment state there?  
Dr Legerton: I am going to hazard a guess at 20.  
Mr Jones: At Cefn Croes there are four technicians on site plus a manager and obviously I get involved as far as Falck is concerned.

Q295 Nia Griffith: Turning to hydro energy, you state that new small hydro should not be neglected as a valuable additional source of renewable electricity. Can you tell us what potential you see in Wales for developing hydro electricity and what obstacles we may need to overcome if we wish to go down that route?  
Dr Legerton: My colleagues who work with me in hydro guided our submission on this point and they identified that there is still untapped hydro resource in Wales which can be utilised. Their suggestion was that perhaps a 20 megawatt target by 2010 would be a realistic capacity to aim for. I go on their guidance. That is the order of magnitude I think we could see yet still to come from Wales from hydro energy.

Q296 Nia Griffith: Could you put that in context by telling us how much that 20 megawatt by 2010 is in terms of meeting renewable targets?  
Dr Legerton: It would be small but that is no bad thing. The philosophy of the renewables generation as a whole is that it is applicable in all sorts of scales and sizes from micro generation at rooftop to more offshore wind farms. I do not think anything is less useful just because it is of a comparatively small scale. It is all about adding up the total contribution to renewables that really matters and that will come from a wide range of different technologies.

Q297 Nia Griffith: That might link into some community projects?  
Dr Legerton: Yes. Smaller projects tend to lend themselves more to community scale involvement.
Q298 Mrs James: You mentioned in your introduction that you are involved in coal technology as well. We are aware that the National Assembly in Wales is currently working on a coal planning TAN. Could you tell us a little bit more about this?

Dr McElroy: The coal TAN is being developed to look at how Welsh coal resources might be exploited going forward. We have some involvement in that. I am not involved myself but that is very much looking at the planning guidelines for future open cast developments in Wales. Obviously for us at Aberthaw, investing as much as we are at the moment, we see an important role for coal in south Wales over the next ten or fifteen years. We would like to see competitive Welsh coal. The alternative is that we have to import that coal.

Q299 Nia Griffith: You mentioned, “... of particular concern to us is the possibility that opportunities to extend the productive life of the Welsh coalfield could be frustrated by changes in the planning regime for coal mines.” Could you explain what you mean by those concerns?

Dr McElroy: I am not fully up to speed on any specific detail with regard to the coal planning TAN but I understand that one of the issues is the proximity to housing development and other development. That is certainly one of the issues that is being looked at, at the moment, in terms of what the guidelines should be for that area.

Q300 Mrs James: You mentioned hydro. What role are you as a company particularly playing in the development of tidal and wave technology in Wales?

Dr Legerton: Through our juice fund, which is money raised through the sale of electricity from the North Hoyle offshore wind farm, we are putting about £800,000 a year into research and development into marine tidal wave type projects. We are supporting the development of those new technologies through that juice fund.

Q301 Mrs James: Is that within the company or open to other organisations?

Dr Legerton: It is open to other organisations to make submissions to apply for that funding, to put into their own business aims.

Q302 Nia Griffith: Could you tell us about the potential for Wales for tidal and wave projects?

Dr Legerton: I am a wind farm developer but I can tell you what I do know. Every renewable has its role to play but of the two tidal is probably more limited in its application than wave energy certainly in Europe and worldwide. Wales does benefit from some high tidal ranges. That is one of the issues we have to address when building offshore wind farms, so there is resource there. It all comes down to when and if they become economically viable to compete in the technology market which we have today, but there is certainly potential there.

Q303 Nia Griffith: Have you designed one which does both at the same time?

Dr Legerton: I have not seen it done yet, no, but you should patent it.

Q304 Mrs James: In Swansea it is of particular interest and there is a lot going on there. You are not specifically involved at the moment with a project?

Dr Legerton: No. To the best of my knowledge we have no direct ties with any private projects at the moment. If I am wrong in that, I will correct it.

Chairman: Thank you very much for your evidence and in particular for your written evidence. If you feel that there is, in the light of the questions today, anything further that you wish to share with us, we would be very pleased to receive it from you. Thank you very much.

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Written Evidence from British Nuclear Fuels Limited (BNFL)

INTRODUCTION

BNFL welcomes the opportunity to respond to this consultation, and is pleased to see the issue of future energy supplies in Wales being given a high priority.

Wales faces a number of major decisions in respect of future energy strategy, and these decisions are becoming increasingly urgent. It is important to note that the Wylfa nuclear power station—which currently provides around 30% of the power consumed in Wales—is scheduled to close in 2010. This has several implications:

- On supply security. The capacity from Wylfa will need to be replaced—at least in part—in order to meet demand.
- On the Welsh economy. Wales is currently a substantial exporter of power to England, yet if the Wylfa capacity is not replaced Wales will switch to becoming an electricity importer, at a time when power prices have seen substantial upward movement.
- On carbon emissions. The output from Wylfa, being generated by nuclear power, produces very low emissions of carbon dioxide. Unless the capacity can be replaced with another low-carbon technology, carbon dioxide emissions in Wales look set to rise substantially.

These issues are exacerbated by the likely closure of a number of coal-fired power stations over the next
five to 10 years, driven by EU legislation (the Large Combustion Plant Directive). As a result, long-term planning decisions need to be made now about the kind of energy future which Wales wants.

The recent review by the Welsh Assembly Government—“Energy Wales: Route Map to a Clean, Low-Carbon and More Competitive Energy Future for Wales”—highlighted the scale of the challenges ahead, but we are concerned that it made no reference to the current contribution of nuclear energy in Wales, nor to any potential role which nuclear might play in the future. We trust that in this consultation the Welsh Affairs Committee will consider all the options objectively, including nuclear energy, in coming to conclusions.

We have focused in our response on the first part of the Inquiry’s remit, namely:

UK Government policy in relation to:
   a. the current and future energy needs of Wales; and
   b. the current and future provision of energy in Wales.

We have no comments on the division of powers between UK Government and the National Assembly for Wales, provided that these are clear and allow timely and effective decision making and delivery of infrastructure projects.

In the remainder of this submission we outline the energy policy challenges facing the UK, recognising that the provision of energy in Wales is set in the context of a well-integrated UK energy industry. We outline the benefits which nuclear brings and address the key issues which arise when nuclear energy is debated. We have not gone into detail on any of these aspects, in the interests of keeping our submission to a readable length, but we would be pleased to offer further detail on any issue if this would be helpful.

FULL RESPONSE

BACKGROUND

1. The UK intends to set itself on the route to providing sustainable, secure and affordable energy for the long term. The UK aims to continue to show leadership in the challenge to tackle global warming. Clear decisions have to be taken to implement options to deliver such a future.

2. The energy policy set down in 2003 was a first step: firmly establishing the importance of renewable energy and energy efficiency, whilst keeping open other options, such as nuclear and clean coal.

3. The world has changed: growing evidence of climate change, increasing global oil and gas demand, further uncertainty over Middle East stability. The UK environment is changing also—becoming a net importer of gas, growing awareness of the need for new baseload capacity, rising carbon emission levels, several nuclear stations reaching the end of their lives, as well as the prospect of coal station closures. Not all of these changes were foreseen at the time of the 2003 White Paper.

4. Tough action is needed now if we are to have choices to deliver the new baseload capacity needed in the next decade.

RELIABILITY OF SUPPLY

5. Recently, UK electricity supply reliability has not been a problem, as the rapid shift towards gas-fired power plants has been underpinned by substantial domestic reserves of gas. However the UK is now becoming a net gas importer, and is expected to be reliant on imported gas to meet at least 65% of demand by 2020. Worldwide demand for gas, in common with all fuels and many other commodities, looks set to rise sharply over the medium term. This is largely driven by the fact that major economies such as China and India are experiencing rapid economic growth, with the associated rise in energy demand.
6. Key sources of gas for the UK will in the short-term include Norway, and in the longer-term Russia, Algeria and Qatar. Surface pipelines will pass over very long distances, and through many other countries, en route to the UK, raising concerns over the prospect of interruptions to the supply of gas to the UK, and consequent disruptions to power supplies. UK electricity security is projected to go from being the best in the G8 to the worst within two decades.

![Graph showing import dependency (%)](image)

**Recent and Projected UK Gas Import Dependency**

7. Concerns are also growing over shorter-term interruptions due to the intermittent nature of key renewable technologies—in particular wind—which are targeted to provide 20% of UK generation by 2020. Against this backdrop, nuclear energy provides reliable baseload generation, fuelled by uranium which is plentiful and which carries minimal risk of supply interruption.

![Bar chart showing magnitude of blackouts](image)

**Magnitude of Blackouts of More than One Day’s Duration Forecast to Occur with 2–5% Annual Probability in the G8 Nations—2004 and 2024**

8. Despite good early progress, UK carbon dioxide emissions are now higher than they were a decade ago. It has already been conceded that the Government target for reducing emissions by 2010 is unlikely to be met.

**Cutting Carbon Dioxide Emissions**
UK Greenhouse Gas and CO₂ Emission Levels and Associated Targets

9. Nuclear energy is the most significant proven large-scale source of low carbon electricity in the UK, and makes a major contribution to avoiding carbon dioxide emissions. Over the coming 10–15 years, reducing CO₂ emissions will become more difficult as a substantial reduction in the existing nuclear generation capacity is inevitable.

Annual Power Generated and Cumulative Carbon Dioxide Emissions Avoided Through UK Nuclear Generation

10. The contributions to date from renewable energy and from energy efficiency savings have been less than hoped for, and it is increasingly clear that other low carbon technologies, including nuclear, have a role to play alongside renewables if the UK is to keep on a realistic track towards its longer-term targets and ultimately achieve a 60% cut in emissions by 2050.

The Economics of Nuclear

11. Electricity prices have risen noticeably in the recent past, in part driven by the global rise in gas prices. Recent studies have shown that the overall generating costs of nuclear energy can be competitive with fossil-fired generation if there are no artificial barriers, such as those currently posed by UK-specific planning risks. Nuclear energy could become more competitive in the future as gas prices are projected to rise further and
the costs associated with carbon dioxide emissions will begin to play a larger role. Nuclear energy is consistently shown to be much cheaper than the leading renewable alternatives, although both nuclear and renewables have a role to play.

**OECD Analysis of Power Generating Costs for Different Technologies**

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**Projected Costs of Nuclear Energy from Different Studies**

12. Nuclear energy is relatively insensitive to changes in the price of the raw uranium fuel, and provides an element of stable cost generation in the generating portfolio, which is helpful in keeping overall prices to consumers low. This contrasts with gas-fired generation, where the cost of raw gas can represent 60% or more of the total generating cost.

**FINANCING AND DELIVERY**

13. Under an appropriate market pricing regime, and with the right arrangements for sharing risks and returns, a new generation of nuclear plant in the UK could be financed through the private sector. In this way, future nuclear build could avoid some of the pitfalls which have characterised major infrastructure projects in the past, including some previous nuclear plants. Private sector disciplines of project management and financial control will help to ensure focused and timely delivery.

14. This approach to future nuclear build would need to emulate new build currently taking place overseas based on internationally developed and standardised designs offered by a few global vendors. International experience further demonstrates that the benefits nuclear energy offers will be delivered most economically if a series of new generation of near-identical stations is constructed. Whilst it might be impractical to foresee a substantial fleet of new nuclear plants in Wales alone, any future Welsh plant could well be part of a larger UK series of identical stations.
15. A key factor in the effective delivery of nuclear plant will be the development, by regulators and the industry, of the current licensing and approvals processes to ensure timely and predictable delivery of all regulatory clearances and planning consents.

**Series Build Brings Successive Cost Reductions**

16. The long term management and disposal of nuclear waste is an issue on which greater clarity is required. The UK, through the Nuclear Decommissioning Authority, is now addressing as its highest priority the management of those wastes generated prior to 1990. More recent wastes are dealt with safely and effectively as they are produced, and the same will be true of any wastes from future nuclear stations. The historic legacy has to be dealt with, with or without new generation nuclear build. Wastes associated with modern reactor designs are much smaller in volume, and are already treated and prepared for long term storage. Therefore UK historic liability provisions are not an indicator of waste management and decommissioning costs for new generation nuclear build. Furthermore, any solution put in place for dealing with legacy wastes could readily accommodate the wastes from a new generation of nuclear plants.

**Wastes from Potential New Reactors Compared With CoRWM Baseline Inventory**

17. Progress is also being made towards defining a way forward for long term storage/disposal through the Committee on Radioactive Waste Management (CoRWM). Implementing a way forward when CoRWM reports next year will help secure public and investor confidence.

18. Countries such as Finland, Sweden and the US are putting in place technical solutions relating to waste issues, and in doing so have addressed public acceptance concerns. Likewise, ways to provide surety on the financial provisions for waste management and decommissioning have been successfully established elsewhere in the world. These could be applied in the UK.
SAFETY AND SECURITY

19. The nuclear industry has an exemplary record in respect of safety and security, with rigorous standards in place. Modern reactor designs have advanced safety features, which bring further confidence in their safe operation, and security procedures at nuclear facilities have been fully reviewed in the light of the evolving climate of global security.

NUCLEAR BENEFITS THE UK ECONOMY

20. The nuclear industry also plays a key role in the UK economy, employing 40,000 directly and supporting many additional jobs. Many of these are skilled jobs in areas where these are scarce, and future nuclear build would offer opportunities to maintain and grow the role played by the industry in this respect.

21. A new generation of nuclear stations would also benefit the UK in terms of GDP and balance of payments, for instance through reducing gas imports. The benefit in GDP terms of a programme to replace the current nuclear fleet has been assessed in a recent independent study\textsuperscript{vii} at around £4 billion per year once the stations are all operational. Part of this benefit is due to the reduced need for gas (which increasingly would be imported) if the UK retains a significant nuclear capability. The gas use avoided by the UK’s current nuclear plants is shown in the following chart.

\textit{Gas Use Avoided by UK Nuclear Stations (assuming no replacement build)}\textsuperscript{viii}

ACTION IS NEEDED NOW

22. Modern nuclear reactors take around five years to construct. However, it would take around an additional five years to get to the point where the industry could start construction. Thorough scrutiny of prospective reactor designs and sites by the safety, environmental and security regulators is required before investment decisions can be made. This represents a hurdle—unique to the nuclear industry—which must be overcome before a firm commitment to progress to construction can be made. A suitable regulatory framework must be developed in order to allow this to happen in a timely manner.
23. It would therefore take about a decade to bring the first of a new generation of nuclear stations on line. There is a compelling case for the UK to put itself on route to a secure, low carbon, affordable energy mix for the long term. Nuclear has a major role to play in that mix, but it can only do so if steps are taken now towards replacing baseload capacity coming to the end of its life by 2015.

24. An urgent review of the UK’s energy policy is required which would include addressing the nuclear issue. Steps to open up the nuclear option include:

— A clear indication from Government that it welcomes a new generation of nuclear stations to replace the nuclear contribution to the UK energy mix.

— Regulators and the nuclear industry working with government to develop planning and other regulatory approvals processes so as to avoid unnecessary delay and uncertainty. Including setting down clear practicable public consultation processes.

— Setting—and moves to implementing—policy on the management of radioactive wastes.

— Providing appropriate market mechanisms to reflect the wider societal benefits of available energy sources, including nuclear energy, in a fair and transparent way. Such mechanisms should address both the lack of long term pricing signals (eg for carbon pricing) in the UK market and the perception of risk among investment institutions (eg the risks associated with early phases of pre-construction activities).

25. In addition, simple steps can be taken in advance of reviewing policy, ie within the bounds of existing energy policy, to become better informed about future nuclear options and their UK implementation. Such steps include:

— The appropriate regulators (NII, EA, SEPA and OCNS) could carry out a review of nuclear reactor designs which are being considered for deployment worldwide today. The UK should have a view on candidate reactors.

— The nuclear regulators could address how modern nuclear reactor designs might go through planning and regulatory processes (nuclear specific and general) in the UK. Well over a decade has elapsed since a new reactor was licensed in the UK, the global market and regulatory framework have changed significantly.

30 November 2005

REFERENCES

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ii “Comparison of the Security of Electricity Supplies in G8 Countries, 2004 to 2024” Prof J H Gittus; Power UK, February 2004

iii “As of where we are now, on the trajectory we are on, we will not meet our domestic target which we set ourselves”; Margaret Beckett, Secretary of State for Environment, Food and Rural Affairs; BBC Radio 4 “Today”, 22 April 2005

iv “Provisional 2004 UK Climate Change Sustainable Development Indicator and 2003 Air Pollutant Emissions Final Figures”; DEFRA; March 2005

v “Projected Costs of Generating Electricity”; OECD / NEA / IEA; 2005
[Data converted to sterling based on £1 = $1.65. Data also excludes Japan and the Netherlands for which estimated costs differed significantly from the average]

vi “BNFL/Westinghouse AP1000—The Reactor Technology Ready Now”; BNFL submission to DTI Energy Policy Consultation; September 2002

vii “Macroeconomic Analysis of Nuclear Plant Replacement”; Oxford Economic Forecasting; March 2005

viii Generation and fuel price figures from “DTI Updated Energy Projections”; November 2004
Percentage of Gas Imported derived from Second JESS Report; DTI / Ofgem; February 2003
**Witnesses:** Mr Adrian Bull, Head of Energy Policy Studies, and Miss Dorothy Seed, Head of Stakeholder Engagement, British Nuclear Fuels, gave evidence.

**Q305 Chairman:** Good morning. Could you introduce yourselves for the record?

**Mr Bull:** My name is Adrian Bull. I am the head of energy policy studies within the energy unit at BNFL.

**Miss Seed:** I am Dorothy Seed, head of stakeholder engagement, also in the energy unit at BNFL.

**Q306 Chairman:** Could you explain your operations in Wales?

**Mr Bull:** BNFL is one of the UK’s biggest nuclear companies. Specifically in Wales, we are the managing contractor of two sites through our British Nuclear Group business, our major clean up, decommissioning site management business. We are the operator of the Wylfa operating station on Anglesey and we are also the site manager for the Trawsfynydd station which has operations now getting ready for decommissioning.

**Q307 Chairman:** What is your role in the proposed decommissioning of the Wylfa power station?

**Mr Bull:** At the moment we are busy operating it. Once it reaches the end of its lifetime in 2010, we would expect that the owner of the site, the Nuclear Decommissioning Authority, will put a tender out for future aspects of the site operation such as decommissioning. Potentially British Nuclear Group could be a successful candidate in winning a bid for decommissioning but that is something to be determined in the future. The owner of the site is the Nuclear Decommissioning Authority and that would be a decision for them to make.

**Miss Seed:** Wylfa will cease operations in 2010 and the end date was set out about five years ago as part of the suite of end dates for the existing magnox reactors. The planning for that closure has been taking place in terms of looking at when the fuel has to be manufactured and the linked plant that will create the various products to go into the fuel and its fabrication. A whole sequence of events has had to take place to align with that end date.

**Q308 Mr Jones:** The Assembly Government has indicated that it wants to extend the life of Wylfa. How easy would this be in practice?

**Mr Bull:** In practice there are a lot of considerations to be weighed into that decision. The first point is to restate it is not a decision for us to make; it is a decision for the Nuclear Decommissioning Authority as the owner of the station. It is not simply a question of taking a decision about the station in isolation. Wylfa is the last of the series of magnox power stations. All of the fuel for those stations has been manufactured at the Springfield site in Preston. They are just in the process now of making the last fuel for Wylfa. They just recently cast the last billet of uranium which is to go into making the final fuel for Wylfa by 2010. Probably the more significant consideration relates to the fate of the fuel once it comes out of the reactor. The consideration there is that there is only facility for reprocessing that fuel. That is the magnox reprocessing facility at Sellafield. Under the terms of our commitments to the OSPAR agreement we have to end marine discharges from the Sellafield site by 2020 so the closure date for that reprocessing facility is set in 2012. It is not simply a question of looking at could we run the reactor for another five years as a decision to be made in isolation. How we would manage the future fate of the fuel post-2010 and whether there is any potential at all for extending the life of the reprocessing facility whilst still meeting our OSPAR obligations for 2020 is a major challenge. Our understanding is that the NDA do not consider it realistic to extend the life of Wylfa beyond 2010.

**Miss Seed:** That would be a decision for the DTI to take on recommendation from the NDA. Any proposal to extend the life or otherwise will be decided by the DTI.

**Q309 Mrs James:** You talked about Sellafield and the knock-on effect of Sellafield on Wylfa. If Sellafield was to close down, where would waste from Wylfa, if it was extended, be dealt with?

**Mr Bull:** There is not really an alternative that would allow you to run the station with the fuel it takes. Magnox fuel has to be reprocessed and there is only one facility to do that. It certainly would not be viable to think about building a new facility to take that fuel for the extra years of potential Wylfa extension. It would have to go through that facility at Sellafield. The two are inextricably linked.

**Q310 David Davies:** It is interesting because I was under the impression that there was quite a strong possibility that the lifespan of Wylfa might be extended. From what you are saying, that is not likely at all. Waste would have to be a factor if it was because there is nowhere else for it to go. Is that a fair summary?

**Mr Bull:** It is not a general waste question; it is spent fuel from Wylfa. Magnox fuel must go through the reprocessing facility at Sellafield. That is a very clear constraint on the operation of the whole magnox fuel site. Because Wylfa is the last of the stations, that makes it a particular consideration. Looking to the future, if we were to think ahead to new nuclear in the UK, we have learned the lesson from having adopted a design of reactor which is unique to this country and we are now running the last few of those stations but we are constrained in terms of fuel supply and the ultimate route for that fuel. In the future we will be adopting standard, international designs for any new reactors.

**Q311 David Davies:** I do not think this is too much of a deviation since you mention fuel. When we met the DTI here, I asked them specifically how much uranium there was left because people having been saying there is a shortage. The DTI could not answer so I did my own research which suggests that there are supplies of uranium 235 for about 100 years. Uranium 238, which is the sort that goes into the new nuclear power stations, could be made to last for thousands of years. Is that correct?
Mr Bull: Uranium 238 is used for fast breeder reactors, which is a different type of technology from anything that we are thinking of or might be considering in the medium term.

Q312 David Davies: These are not the APG 1000, if that is the correct name for the reactor?
Mr Bull: It is the AP 1000.

Q313 David Davies: They do not use 238?
Mr Bull: There would be both isotopes in there because uranium is a mixture of two different atoms. It is the uranium 235 which is the fuel content in the historic magnox, the AGRs, and it would also be the isotope that provides the energy in an AP 1000 or anything you might think of for potential new nuclear in the UK.

Q314 David Davies: Is that estimate of 100 years about right in your opinion?
Mr Bull: In respect of any mineral resource or any fuel, there is not a clear, straight answer as to how much there is in the world as a natural resource. It depends on the cost of extracting it and at what level it is cost effective to do that. The witnesses from the DTI referred to the authoritative document on this which is the OECD’s study on uranium resources, popularly known as The Red Book. That identified that there are known resources of uranium that are extractable quite affordably to fuel at the current rate of use of uranium through the global nuclear industry for about 50 or 60 years. If you look at uranium resources that are known but are slightly more expensive to extract, perhaps less than twice as expensive, and you are also extrapolating from what they call likely resources rather than specifically identified resources, that pretty much trebles the amount of uranium there is in the world.

Q315 David Davies: Was that based on current usage or was that extrapolated to take account of the fact that various countries are developing their nuclear technologies?
Mr Bull: The figure is based on the annual usage of uranium at the moment in the world’s nuclear industry with about 440 reactors. If you can treble it, if we were to think about trebling over the next few decades the size of the world’s nuclear fleet, you would be able to operate all those potential new reactors for their design lifetime of 50 years or so with uranium we know about today.

Q316 Nia Griffith: Returning to the waste issue, you mentioned that wastes associated with modern reactor designs are much smaller in volume and are already treated and prepared for long term storage. Are you there referring to existing reactors or are you talking about the new generation that is coming along?
Mr Bull: It is a process of continuous improvement. The kind of reactor like the AP 1000 or the EPR produces much less waste than older designs like magnox or the Gas Cooled reactors. We already have Sizewell B in the UK, which is our one water cooled reactor and perhaps a more modern design than the magnox or AGR stations. There is still an improvement in the waste volumes per unit of energy produced but it is less pronounced compared to the AP 1000 and the old magnox stations.

Q317 David Davies: How much waste are we talking about from the new generation of reactors? Obviously, there are different grades. There are some things which are radioactive but are not terribly dangerous to life. Of the high level radiation, how much is produced annually by one of the new power stations? Enough to fill this room? Are we talking about enough to fill this building or perhaps a very small amount? I just do not know.
Mr Bull: Perhaps it is instructive to think about the three different types of waste. There is low level waste which is things like tissues and protective clothing and the significant volumes of concrete that make up the reactor and the building. There are then the two that are of more concern: intermediate level waste, things like the metallic tubes that the fuel is held in, and high level waste, which is waste that can generate its own heat, things like used fuel as it comes out of the reactor or it can be the very high level, concentrated waste that would come out of reprocessing. I think the gist of your question was for a new nuclear station. If we were to take the fuel for perhaps ten of those that we would need in a year which would be enough to keep the proportion of the UK’s electricity at around 20 to 25% coming from nuclear, the fuel for a year’s worth of that would fit into this room.

Q318 David Davies: Everything?
Mr Bull: Everything.

Q319 Mrs James: In your submission you talk about the historic legacy of dealing with waste and decommissioning costs et cetera, so I take it that the decommissioning costs are separate or different to what I would know as storage costs of waste products. You also talk about the legacy costs which are, I take it, from previous amounts of waste that have been produced. I am a little confused about what the actual costs are. What percentage would you allocate to the disposal and the safe management of those wastes, however they are produced or when?
Mr Bull: In terms of the proportion of the generating costs for nuclear electricity, the waste management cost by whatever route—we would assume it would not be from reprocessing—comes in at about 2 to 3% of the total generating costs of electricity. There is a similar proportion that would represent the decommissioning costs of the power station at the end of its life. Both of those are based on some fairly conservative assumptions about what you would have to do in respect of waste management and decommissioning. There is not a UK policy in respect of radioactive waste management. The Committee on Radioactive Waste Management is currently finalising its report on that and is due to report this year. If they are going down the route of
international best practice from elsewhere in the world, any of the short list of options that they are looking at would be well within that.

Q320 Nia Griffith: If Wylfa did close in 2010, what sort of timescale would you be looking at for decommissioning?
Mr Bull: The timescale for defuelling, taking the fuel out of the reactor, runs for another two years until 2012.
Miss Seed: The overall decommissioning goes in a number of different phases. Defuelling is about two years. From that we are going to a period of care and maintenance which is getting rid of some of the ancillary aspects of the power station which will last I think for about 20 years.
Mr Bull: The care and maintenance preparation would start in 2009 and end in 2025 according to the British Nuclear Group data.
Miss Seed: Those are the current time frames. The NDA has issued its draft strategy in terms of proposals to look at those time frames again. It may well be that those end dates will change as far as the length of that total decommissioning period is concerned.

Q321 Mr Jones: You indicated in your submission, in the section headed “Action is Needed Now” that modern nuclear reactors take around ten years to build and commission, presumably from the moment that the decision to do so is taken. On the assumption that the forthcoming energy review does conclude that we should be building a new generation of reactors in this country, would it be the case that, for a period, this country would be without any nuclear generated power at all?
Mr Bull: The ten year period is not just the building and commissioning of a station. You are quite right; it will be ten years from the decision being made, if one were to be made in the relatively near future, to the first generation of electricity. The first three years would be our estimate for what it would take to license the new technology for use in the UK, technology like the AP 1000 or the European pressurised water reactor. Although they are licensed for use in their country of origin, they are not yet licensed for use in the UK, so there would have to be a review by the safety inspectors to satisfy them about these designs which do not have the equivalent kite mark of approval. That is a one off process. We would estimate two years for a public inquiry to look at the local issues. After five years you start the breaking of the ground to do the building and commissioning. The total period of ten years is absolutely right. The latter five years is the building and commissioning component of that. In respect of whether we would be without nuclear generation, for Wales, the answer is yes because we are working on the presumption that we discussed before that Wylfa will close in 2010. For the UK in general, no, because our last Advanced Gas Cooled reactor will run until 2023. According to the current schedule Sizewell B, our pressurised water reactor is due to run until 2035 so we will still have nuclear in this country but we are expecting quite a number of the stations, on current projections, to close within the next ten or fifteen years.

Q322 Jessica Morden: Would it make sense for new build to be on existing sites or would new sites be considered?
Mr Bull: It absolutely makes sense to look at the existing sites. There are three sensible reasons for that. The first is they already have nuclear site licences. That is a step in the process that is avoided. There is a grid infrastructure there, the substations and so on, which although it may need to be refurbished and upgraded, would still be easier than starting with a brand new site. Perhaps most importantly—referring to the phrase that we heard from your witnesses earlier of “inverse NIMBY-ism”—we get very good levels of support for nuclear in the communities around where we have existing stations, as well as having the skill base there. A lot of the people who have quite high quality jobs within the nuclear industry at the moment would retire at the date when the reactor ceases its operation and they will be very keen to see new nuclear capability erected and operational on the same site for their own reasons.

Q323 Jessica Morden: There has been press speculation about a new site being in Aberthaw. Can you shed any light on that? modern nuclear reactors take around ten years to build and commission, presumably from the moment that the decision to do so is taken. On the assumption that the forthcoming energy review does conclude that we should be building a new generation of reactors in this country, would it be the case that, for a period, this country would be without any nuclear generated power at all?
Mr Bull: The ten year period is not just the building and commissioning of a station. You are quite right; it will be ten years from the decision being made, if one were to be made in the relatively near future, to the first generation of electricity. The first three years would be our estimate for what it would take to license the new technology for use in the UK, technology like the AP 1000 or the European pressurised water reactor. Although they are licensed for use in their country of origin, they are not yet licensed for use in the UK, so there would have to be a review by the safety inspectors to satisfy them about these designs which do not have the equivalent kite mark of approval. That is a one off process. We would estimate two years for a public inquiry to look at the local issues. After five years you start the breaking of the ground to do the building and commissioning. The total period of ten years is absolutely right. The latter five years is the building and commissioning component of that. In respect of whether we would be without nuclear generation, for Wales, the answer is yes because we are working on the presumption that we discussed before that Wylfa will close in 2010. For the UK in general, no, because our last Advanced Gas Cooled reactor will run until 2023. According to the current schedule Sizewell B, our pressurised water reactor is due to run until 2035 so we will still have nuclear in

Q324 Jessica Morden: Would there be any benefit from new nuclear being built in south Wales?
Mr Bull: There is demand in south Wales. South Wales is currently a significant importer of electricity, whereas north Wales is an exporter so from that point of view new baseload capacity of any kind in south Wales would be helpful in the longer term to ensure the security of supply and so on. New nuclear would be focused on the existing nuclear sites for the foreseeable future. There is no suggestion to look at sites in Aberthaw or elsewhere.

Q325 David Davies: What advances have been made in the design of nuclear power stations? I am particularly interested in the AP 1000 which I think would be the most likely kind of station to be built if we do get any more new build. Could you tell us about the step change in terms of output? Would that be increased or would we simply be replacing existing output? Can you also mention something about the costs in terms of kilowatt hour? We asked the representatives of Falck about that and I think we ought to ask you the same question.
Mr Bull: To take the AP 1000, in terms of its output, that would be typically around 1100 megawatts which is just over a gigawatt of electricity generation from a single reactor. The Wylfa site at the moment,
to put that in context, delivers around 980 megawatts from its two stations. That is of the same order. The EPR design is a bigger reactor at around 1600 megawatts of output for a single reactor. In terms of how they differ from past technology, there are a lot of developments in terms of the simplicity of design which both those reactor designs embody to quite a substantial extent. We have realised in this country that moving to more and more complex, one-off designs is not necessarily the way to go, particularly when you are looking at attracting private sector investment and delivering these stations on a relatively short timescale of a three-year construction within a five-year construction and commissioning period. That can be achieved through elements of modular construction so that there can be a lot of construction activity going on in parallel off-site, if we had large modules like control rooms and so on being shipped to the site near completed and assembled on-site. Also, some of the features of the reactor design itself. The AP 1000, for instance, embodies what we call passive safety. Instead of relying on multiple sensing, instrumentation and actuation systems within the reactor, it is a more simple design that relies on things like gravity and natural thermal circulation to assure safety.

**Q326 David Davies:** To put it in layman’s terms, what are the chances of one of these things going boom?

**Mr Bull:** That is the kind of question you always dread being asked because anyone who works in the industry will know you can never give an absolute guarantee of safety on anything. Increasingly, as designs progress, they meet tighter and tighter safety standards for their operations against different levels of accident scenario that people might look at. For instance, the AP 1000 is even safer than designs that are operating today.

**Q327 David Davies:** What happens if somebody fires a jumbo jet at it? It is a serious question. I am asking these questions all the time and I do not know the answers. There would be an explosion but would the whole thing go up or would it simply be an explosion and some sort of collateral damage to the surrounding area?

**Mr Bull:** That is a question I am much more comfortable being asked. The big advantage of nuclear power stations is that they are some of the most robust structures on this earth. They were designed that way originally not to be resistant to aircraft impact but to keep what is inside inside. It works both ways. The industry does not do full scale testing of flying planes into power stations, you will be very relieved to know, but there has been some experimental work done in the United States where a sample of concrete wall, representative of the kind of wall used in a nuclear station, was erected in the desert and a Phantom military jet fully loaded with fuel but without a pilot was flown into the wall. Not surprisingly, it wrote off the plane and made about a six-inch indentation in the concrete wall. That is one piece of hard, practical evidence about the robustness of these structures. There has also been quite a lot of modelling work, as you might expect, since September 2001, looking specifically at the question you ask. The best and most authoritative in the world was done by the Electric Power Research Institute in the United States and their studies showed that there would be no release of radioactivity from any credible aircraft impact.

**Q328 David Davies:** Is 2.3 pence per kilowatt hour a fair summary of the total cost of building and running a nuclear power station?

**Mr Bull:** Typically, it is a figure of that order. It does very much depend on how many you build. The cost of a single unit, the first of its kind, built in the UK would attract some one-off costs. If we were to look at building the same design in several locations, that brings the average cost down quite notably. We have seen that happen in other countries of the world. It is happening in the Far East. It is the approach the French have always adopted with a dozen or so of the same design. After they have built a mini-series, only then do they upgrade to the next level of design. They have seen substantially better economics. It is worth saying again that new nuclear in this country would not be on the same basis that we have done it in the past. In the magnox series of reactors in particular, every one of those was different because we were right at the forefront of the nuclear industry. At the time, the industry was government run and the technology was in its early stages. Each time we built a design, we identified a number of ways in which we could improve on the next one. With seven AGR stations, we have four different designs. We have three pairs and Dungeness which is a single design on its own. We have again a series of changes in the design. The only way in which the private sector would look at new nuclear in this country would be if we were to take standard, internationally recognised designs that are being built or approved elsewhere in the world and built those in the UK to the same spec. That is the model that is being speculated upon.

**Q329 Nia Griffith:** When we talk about cost, we also need to take into account the raw material, the uranium. One of our suppliers, I presume, is still Australia.

**Mr Bull:** That is right.

**Q330 Nia Griffith:** Do you envisage price rises with competition from other areas in developing nuclear? When you have a shortage of commodity people tend to put up prices. What competition is there out there in terms of variety of source of supply, because we have been hit by a security of supply issue in gas and we would not want the same to happen on this.

**Mr Bull:** Absolutely. Australia is one of the source countries. Canada is another big source of supply. The timescale for identifying new mines or extending mining operations that are already in existence is similar to the timescale for building new stations so the supply side in that respect can keep track of where the demand is likely to come from and how it is likely to change around the world.
forward visibility of what the demand curve is going to look like. You specifically referred to a comparison with gas. That is a good point to make.

If we look at electricity from a gas fired power station, the cost of the raw gas itself accounts for between 60 to 80% of the total generating cost. As the gas price in the world market changes, so the cost of the electricity from the power station goes up and is very closely linked to it. For nuclear electricity the total fuel assembly accounts for about 20% of the total electricity cost but of that only about 5 to 10% is the uranium. The rest of it is enriching the uranium and fabricating the tubes and the finished fuel assembly. You can afford a much bigger rise in the world price of uranium without seeing much of an impact on the electricity costs compared to gas. The two are very closely linked and obviously that is why gas prices have been going up around the world recently. We have become a net importer and much more linked to the world gas market which is reflected very strongly in the electricity price.

Q331 Mrs James: My concern is that the only benefit of nuclear power, as it is always portrayed, is it is cheap. In the sixties when these were being proposed, we were told that nuclear energy would be pennies, that we would all see a time in the 21st century when we would halve fuel costs. There was a very rosy picture painted and frankly I think the safety side of it was possibly played down at that point. We are much more aware now. When will nuclear get too expensive? You have already talked about the Red Book. You have talked about 50 to 60 years of uranium reserves that we know of now. We are a much more educated generation now. We are very aware. There are no undeveloped parts of the world so we have a pretty good idea where these uranium reserves are. Can you envisage a point where uranium costs will become prohibitively expensive or where we just run out of uranium?

Mr Bull: Absolutely. I certainly would not argue about the bottom line is in comparison to nuclear you just cannot make the grade. I see it is a much broader picture of having everything in the mix at some point.

Q332 Mrs James: It appears to me that nuclear is on a very advantageous playing field. We have heard evidence from other renewable industries that their research and development costs are prohibitively expensive. Always the bottom line is in comparison to nuclear you just cannot make the grade. I see it is a much broader picture of having everything in the mix at some point.

Mr Bull: I am glad you have raised that. We know of 50 years’ worth of supply of uranium at a market price that is seen today as a similar sort of figure that you will see in virtually every commodity. Part of the reason for that is prospectors simply do not go looking for where the commodity is going to come from in 100 or 150 years’ time. What we have seen is substantial development in the technology used to prospect for uranium. To give you one example, a lot of the work done scanning in Canada for uranium resources was done some decades ago on airborne scanners. They would fly a plane over. It had equipment on the plane that would look below the ground and sense what the geological makeup of the ground was. At that time, that equipment could sense down 100 metres into the earth’s surface. The technology we have now will go ten times deeper than that so we know we can look a kilometre down rather than 100 metres down. We as an industry have not been back to do that because we already know where the uranium for the next 50 years can affordably come from. There is no real impetus to go and look beyond that. We find this picture with a number of mineral types that people look for. As demand goes up and the price goes up for a short period, people go out and look much more carefully and extensively for where it will be. I have seen data that is true for a number of minerals. You find world resources going up once the price goes up demand starts to go up because there is an awful lot more exploration done in finding new deposits and reserves. If we think about the uranium that we already know about that would fuel a world fleet three times as big as the one we have now right the way through the design life of those power stations, the question you are asking is not relevant to thinking about our future energy needs in the UK and the decisions we might make in the next 10, 15 or 20 years about what kind of power station to build. Whatever happens elsewhere in the world, we know that there is uranium there to provide the fuel for any installations we might think about building.

Q333 Nia Griffith: Can we return to the timescale? If you build a new nuclear reactor, what is its lifespan before you decommission?

Mr Bull: The typical operating lifetime would be 40 years but we are already seeing in countries like the United States reactors coming up to operating close to 25 or 30 years. Quite a number of those have put in for a lifetime extension to extend their safety case for another 10 or 20 years’ operation beyond that. Lifetimes of 60 years are certainly not infeasible.

Q334 Mrs James: You mentioned CO₂ emissions. Can you explain to us what levels of CO₂ emissions are made by nuclear power stations? You talked about the advantages.
Mr Bull: Do you mean which part of the fuel cycle contributes to—?

Q335 Mrs James: Just overall really. You talked about it as a benefit.

Mr Bull: Nuclear electricity is carbon free at the point of generation. The power station does not produce carbon dioxide or other greenhouse gas emissions in the way that fossil fuel stations do. Overall, we have to take into account the emissions associated with mining uranium, transporting uranium around, enriching it, the energy that goes into building the power station and the energy required associated with waste management and decommissioning. When we factor all of those into the picture, we find that nuclear is about on a par with the best of the renewables. It is about as low overall as you can get in terms of its CO₂ emissions.

Q336 Mrs James: Do you think that you can make a contribution to the government’s climate change goals?

Mr Bull: Absolutely. We already have nuclear, both in Wales and across the UK, making a substantial contribution to the electricity goals. We have to recognise that if we allow those stations to reach the end of their scheduled lifetime, to close and be replaced by something else, unless that all comes from renewables, the emissions will go up. Even to keep our CO₂ emission levels at the level they are now is going to be quite challenging as our nuclear stations close. If we are serious about making the major cuts in our CO₂ emissions that people are talking about now—and the UK government have committed to putting ourselves on a path towards a 60% cut by 2050 across all our industry—then we need to be looking at making huge reductions in the electricity sector and that means a much greater contribution to all low carbon technologies. It is not just nuclear and renewables; it is clean coal with the technology to capture the CO₂ and store it so it does not enter the atmosphere, but again that is a very new technology and it has not been demonstrated on a large scale as yet. Certainly we would encourage work to see that brought to a commercial scale development as well.

Q337 David Davies: You are, if anything, being quite hard on yourselves because it must be the case that nuclear power is as green in that sense as wind power. When we spoke to the representatives from the wind energy organisations, they accepted that there has to be some form of back-up operation in place in case of no wind. They also mentioned, unless I misheard, that there has to be some sort of back-up operation in place in the case of nuclear energy in case there is some sort of glitch. Is that the case?

Mr Bull: I think it is a general comment about the supply side of the electricity industry anyway that, if you are taking a national view of matching supply and demand minute by minute, which is what we have to do—electricity does not lend itself to being stored easily—there is always the possibility that a major station will go offline for some reason. We have the example of Sizewell B quoted because it is just about the biggest single station that we have in this country so it will have the biggest impact.

Q338 David Davies: Does it go off very often?

Mr Bull: I could not give you the details off the top of my head but no.

Q339 David Davies: It works more than 30% of the time?

Mr Bull: The typical load factor—I think you discussed this with the earlier witnesses where we were talking about figures of between 20 to 30%—and the equivalent figure for a nuclear station would be in the high eighties or early nineties percent. The difference would be that the down time for nuclear stations is made up almost entirely of scheduled refuelling closures.

Q340 David Davies: Can you turn up the volume to manage peak demand? You get certain peak demand for electricity. Can you switch up the power and switch it down again fairly quickly?

Mr Bull: No, because nuclear operates very closely to rated capacity all the time. Because of the nature of it, it has low operating costs and relatively high up front capital costs, in many ways like renewables. Once you have it there on the system the lowest margin cost operator is probably a nuclear station.

Q341 Nia Griffith: Supposing the UK government decides to go down the nuclear route but the Welsh Assembly remains opposed to it. How would you see this difference of approach being managed and could you see the UK pursuing a nuclear energy policy with Wales remaining out of it?

Mr Bull: There are two slightly different but related questions. The first part I think you discussed in some detail with witnesses from the DTI a few weeks ago. I looked at their evidence and I certainly would not contradict their view that the decision ultimately rests with the Secretary of State at Westminster. In relation to the second part of the question and whether there could be a nuclear free Wales but a nuclear programme in the rest of the UK, yes, that is feasible. There are different factors that would weigh against different sites. Wylfa would have some features that would be good or bad; other sites would have different pros and cons. Ultimately, it would be a decision for investors to make and site owners as to how that panned out but, looking at the impact that would have on Wales, Wales currently is a net exporter of electricity and north Wales in particular is a net exporter of electricity. That would leave Wales importing. I would guess, substantial amounts of electricity unless there was some other capacity built in Wales, in which case the question would be can you manage the security of supply aspect as well as the carbon emissions aspect. If you were building a new baseload station, that would traditionally be a gas or coal fired station. There are
scenarios in which you can think of other types of capacity built in Wales to meet the demand, perhaps at the expense of carbon emissions, or else look to a future where both north and south Wales are importing electricity from elsewhere.

Q342 Nia Griffith: There are things like tidal and there is the supply issue as well.

Mr Bull: If that becomes cost effective certainly there is a role for that to play and Wales, as I understand it, has significant coastal resources that would be suitable.

Chairman: Thank you for your written and oral evidence. If you feel that you want to add to anything in the light of the questions that have been posed to you today, we would be very pleased to hear from you. Thank you very much.
Written Evidence from Express Power Limited

1. **Introduction**

The company Express Power Limited wishes to develop a major renewable energy facility based at the brownfield Capital Valley site, Rhymney, South Wales. The integrated project is designed to produce electricity from green forestry waste, and reclaimed wood and wood derivatives. Plans include a 20 MW Renewable Green Power facility together with a Pelletised Wood Manufacture Plant.

The preferred site has been selected from a number of other UK options because of logistics, including potential long term green timber and clean wood waste supplies, rail transport, links to the National Grid as well as the important availability of a suitable local workforce. The development will create 20 long term quality jobs plus a further 50 in fuel management and transportation.

To date Express Power Ltd has expended some £2 million in the development phase of Capital Valley to devise a generic design for a plant with an electricity output of 20MW. The main plant will be supplied by Siemens plc, who are leaders in the design and operation of this type of equipment. Negotiations between the company and Caerphilly County Borough Council are currently progressing well.

Express Power Ltd is pleased to submit evidence to the Welsh Affairs Select Committee Inquiry into Energy. We believe that biomass will play an important role in delivering UK Government’s renewable targets and specifically that our Capital Valley proposal offers an early direct contribution to renewable targets currently set for Wales and as determined by the Kyoto Treaty. It also offers Wales the opportunity to become a net exporter of green energy and biomass products (pellets) for co-firing elsewhere in the UK.

We would urge Members of the Welsh Affairs Select Committee to evaluate the potential role of biomass and in particular to consider the nature and scale of projects required, if Wales is to be a lead contributor to renewable energy provision for the UK.

2. **Background**

Issues emerging toward the end of November 2005 revealed a number of serious weaknesses in the energy supplies for the whole of the United Kingdom. The potential shortage of gas was predicted and well documented in the early part of the last decade. Yet during this period, a “Dash for Gas” provided a relatively cheap, short term solution, to the need to increase generation capacity immediately post privatisation of the electricity industry. In addition it offered interim reduction of the nation’s reliance on ageing coal-fired plants and nuclear energy.

However, the “Dash for Cash” has contributed to the current difficulty facing the UK with dwindling stocks of economic gas supplies from the North Sea. As a result, the number of gas-fired Combined Cycle Gas Turbine Power Stations are currently uneconomic to operate due to the rapid rise in wholesale gas prices over the recent months.

Against this backdrop, many coal fired plants are also nearing the end of their technical life and are facing punitive costs related to carbon emissions. Meanwhile the future of nuclear energy remains a highly sensitive political issue.

The overall effect of the above is that there is now a shortage of economically viable generation capacity throughout the UK. At the same time, there is an express political will, as well as an international obligation, to generate more UK energy from renewable resources.

Whilst it is recognised that renewable energy will never wholly replace bulk power generation from major power stations, it does, however, provide a secure source of energy that is not adversely influenced by political uncertainty overseas.
The Government has set a target of 10% of UK energy requirements being generated from renewable sources by 2010. The Government has also committed the Electricity Supply Industries (ESIs) to produce 15% of their maximum demands for energy from renewable sources by the year 2015.

The Welsh Assembly Government has a target of 4TWh of electricity per annum to be produced by renewable energy (including biomass) by 2010 and 7TWh by 2020.

3. Express Power Capital Valley Project

Capital Valley is a 25 acre industrial park in Rhymney, Caerphilly, South Wales. It is approximately 25 miles from Cardiff and located adjacent to major road network and developing industrial parks. A rail link runs into the Capital Valley industrial park and sea ports of Newport and Barry are within easy reach. The area is within the EU Objective 1 region and there is a good, available local workforce.

The Capital Valley Industrial Park is ideally situated for the development of a major renewable energy project due to its proximity to a reliable source of fuel in the form of wood from local Welsh forests and/or clean wood or wood derivatives reclaimed from the existing stream of recyclable materials. Both of these fuels will receive accreditation for payment of Renewable Obligation Certificates (ROCs) via OFGEM. There is also a high quality labour force in the area which can be retrained in the various disciplines required.

Specifically, Express Power Ltd wishes to develop two new renewable energy projects on the Capital Valley Site thus:

(i) 20 MW Renewable Power Project

The power project proposed for the Capital Valley site will be commercially viable and based upon our philosophy of technical simplicity, and reliability designed to create long term confidence in our overall business and the jobs associated with it.

The fuel employed will be clean wood or wood derivatives reclaimed from the waste stream throughout South Wales. The project will require around 175,000 tonnes of fuel per annum throughout the life of the station and we wish to source this fuel from within Wales and wherever possible, it is our intention to secure contracts for the full supply with local contractors. All fuel used will be required to receive full accreditation for Renewable Obligation Certificates (ROCs), from OFGEM.

Our research indicates that currently all 175,000 tonnes of our proposed feedstock per annum goes to landfill. The process of producing 184,000 Megawatt hours of green electricity reduces the landfill requirement to around 5,000 Tonnes of ash, resulting in a landfill saving of 170,000 Tonnes per annum. As such, the project offers a significant environmental benefit and cost saving to local authorities.

Whilst recognising that our operations will involve certain amounts of road traffic our research has revealed that the use of renewable fuel for power generation, directly as chipped wood or as pelletised wood co-fired with coal, achieves a net saving of more than 90,000 tonnes of carbon dioxide CO2 per annum, taking full account of emissions due to road traffic. Significantly, this saving amounts to 0.06% of total UK production of CO2.

We anticipate that 20 long term quality jobs will be created at Capital Valley on the Renewable Energy Plant plus a further 50 in fuel management and transportation.

The total capital cost of the energy project will be of the order of £45 million, part of which will be inward investment from Europe via Express Power Ltd’s Anglo-Dutch parent company.

(ii) Pelletised Wood Plant

In addition to the above energy plant, Express Power Ltd will develop an associated Pelletised Wood Plant that will ensure all possible biomass fuel supplies are fully utilised and on-site wood waste minimised.

Under current legislation major power station operators are permitted to co-fire existing power plant with a mix of coal and wood. Technically the most effective way to utilise this material is in the form of wood pellets manufactured to a detailed specification prepared by the plant owners.

The market for this fuel is immature but developing rapidly. Bearing in mind a modern coal fired steam turbine generating plant can consume up to 1,500 Te of pellets per day on full load, this equates to more than 450,000 tonnes per annum allowing for 65 days per annum for maintenance.

Initially we propose to install a plant capable of delivering 365 Te per day which equates to 100,000 Tonnes of pellets per year. As a consequence, there is considerable long term opportunity for expansion of this operation as more feedstocks become available.

The project will generate of the order of 15 high quality, full time, long term jobs for directly employed personnel plus a further 50 indirectly employed in forestry, coal production and supply (coal is used to fuel the wood dryer), and transport. There will of course be many more jobs indirectly created in the need for support services and the wider economy.

The project has been fully scoped and capital cost of the complete installation will be around £8 million and we envisage the new business to be in full commercial operation by mid 2006.

As part of the Capital Valley development, as outlined above, Express Power has developed a standard design for a biomass based renewable energy plant with an export capability of 20 MW electrical, in which the capital cost will be around £45 million. Whilst not specifically a Wales only problem, current OFGEM certification processes greatly increase financial uncertainty and are a constraint on business development of this nature.

Proposed biomass fuels for our plants are well documented and understood from a technical standpoint. However, under the current regulation rules, accreditation of the proposed fuel for Renewable Energy Certificates, (ROCs), cannot be obtained before construction of the project is complete. As such this greatly increases the financial risk and uncertainty for biomass projects and may well be a disincentive for similar projects. Any new business, in which a capital commitment of such magnitude (eg £45 million) is required without reasonable certainty in the final revenue stream, represents a massive risk to shareholders.

The responsibility for granting this accreditation rests with OFGEM, and whilst there seems to be a superficial understanding of the commercial dilemma facing developers within OFGEM, there has been no change in the certification process to date.

It is fully recognised that OFGEM and the DTI should require proper, legally binding guarantees regarding fuel type and quality, and this will normally be given by the developer. However, the current situation represents a considerable deterrent to any new entrant to the renewable energy business, as in some circumstances, a commercially viable project can be rendered un-financable where bank funding or venture capital is required.

If biomass is to play a significant role in the helping the Government to achieve its 2010 renewable energy targets in Wales and elsewhere in the UK, then OFGEM and the DTI should be encouraged to revise the process of certification to be more business friendly.

5. Conclusion and Issues

Express Power Ltd’s Capital Valley development offers clear, direct advantages to Wales in terms of biomass based renewable energy because:

— Biomass fired power stations are demonstrably carbon neutral and do not contribute to global warming.
— Long term fuel supplies can be grown, harvested, transported, and processed in Wales.
— 20 high quality, long-term local jobs will be created plus an estimated 50 others secured or created in respect of associated supply and transportation.
— Industry and or public sector users located close to a renewable plant could benefit from reduced green energy prices.
— Whilst it is recognised that energy out-turn prices will inevitably increase over the years throughout the UK any production cost escalation in renewable energy will be based upon UK labour and material costs and not related to imported gas and oil.
— Bearing in mind the UK commitment to importing costly gas from Europe it is anticipated that the national wholesale energy market prices will increase more rapidly than local generation operated on local feedstock.
— The economics of localised projects will be based upon fuel production costs in Wales and not influenced by financial and political dynamics overseas.
— The Capital Valley project will make a major contribution of 20MW per annum to Wales’s renewable energy output and the UK Government 2010 targets.
— The biomass plant can be operational by mid 2006.
— OFGEM and the DTI should review the timing of the certification process of fuels for biomass projects in order to encourage rather than deter developments.

Express Power Limited would be pleased to supply further information and detailed plans as well as giving oral evidence about biomass to the Welsh Affairs Select Committee Inquiry into Energy in Wales. The company would also like to invite officials and Members of the Welsh Affairs Select Committee to make a site visit to Capital Valley.

Meanwhile we would like to thank Members in advance for considering this important development that we hope will make a significant contribution to the future of renewable energy supplies from Wales.

December 2005
Mr Maurice Price, Chief Executive, Ms Julie Kendrick, Commercial Director, and Mr Malcolm Harrison, Business Development Director, gave evidence.

Q343 Chairman: Good morning. May I welcome you all to the Welsh Affairs Committee and may I begin by asking you to introduce yourselves?

Mr Price: My name is Maurice Price and I am Chief Executive of Express Power Ltd. We are a wholly-owned subsidiary of a group called Express Park, which predominantly consists of shareholders from Holland, a company called Subinvest BV. We are a stand-alone company. Our Commercial Director is Julie Kendrick and the Business Development Director is Malcolm Harrison.

Q344 Chairman: Could you provide us with a little more background information about the company that you represent?

Mr Price: The company, Express Power Ltd., was set up some four years ago. As I say, we are part of a property development company. We are a wholly-owned subsidiary, but we are a stand-alone company within the group. The reason that Express Power was set up is that the main shareholder, Mr Eric van (Loew), has a passionate interest in renewable energy and he has business interests all across Europe. He was seeking to supply green energy to tenants on a 100 acre development site in the West Country, in Somerset. That was the first project we tackled. We are now looking at a number of projects across the UK and in particular one in the Capital Valley site in Rhymney, South Wales. In the main project we have focused on biomass. We are looking to burn reclaimed timber from the waste stream—it is clean, green and very carefully selected—and use that in a conventional combustion arrangement to produce electricity. If the opportunity presents itself and if local industry is interested, then we would look at supplying heat locally as well.

Q345 Chairman: Can you paint a picture for us of the range and variety of biomass energy across Europe?

Mr Price: I am no expert. I introduced my colleague, Malcolm Harrison. Just looking at the UK, in the biomass development, which is my predominant interest, we have looked at wood, miscanthus, willow and forestry waste. Personally, I am convinced that there is potential for a mix of fuel which will create a good, solid basis for a biomass-based industry. To add a further comment, my company’s ambition is to develop five projects across the United Kingdom, at least two and possibly even three in Wales, so that we finish up with a 100 MW business solely based on biomass and green energy.

Q346 Chairman: Perhaps Mr Harrison could say something about the situation in Europe and how Britain fares in relation to the rest of Europe.

Mr Harrison: Compared with the rest of Europe, I am afraid we are pretty well down the league table. I am looking at information here from an EU website which shows the amount of primary energy developed from wood, so it is purely wood. At the top of the league for 2004 is France at just over 9% of its primary energy, followed closely by Sweden at just over 8%, Finland at 7%, Germany at 6%, Spain at 4% and Poland at just about 4%, and I am afraid the UK is down at 1.2%.

Q347 Chairman: How do you account for that difference?

Mr Harrison: It could well be to do with the wood resource in those countries, but possibly it is down to the different regimes that encourage biomass, particularly the different types of electricity tariffs that are applicable.

Q348 Chairman: Are you suggesting that the respective governments in different parts of Europe support biomass energy more strongly than the UK?

Mr Harrison: I think they possibly have a different type of mechanism that perhaps is not as competitive as here.

Q349 Jessica Morden: Within 2% for the UK, how does Wales compare with other parts of the UK in terms of energy currently generated from biomass?

Mr Harrison: To be honest, I do not really know. This is just a global figure.

Mr Price: Adding a comment there, we are aware of two 10 MW projects that have received financial support, I believe either from the Assembly or WDA. Personally, I am not aware of any other projects. If I may add another comment regarding the planning issues associated with projects, we have developed a generic design of about 20 MW export. We have invested very considerable sums of money, nearly £2 million, in the development of this, in partnership with Siemens. Anecdotally, we reached the point where we had all statutory objections removed from our first project in Somerset, we had the support of the planning officers; the local politicians turned it down; and on appeal the appeal was dismissed. The difficulty then for a company like ours, which consists of private investors who have a serious interest in green energy, is that the cost of that was £2 million. We then begin to address the risks that investors are taking by investing in a project, albeit with all the technical and logistical issues solved and addressed. The risk issues relate predominantly to planning and the fact that, even with some encouragement from central government, the local planning personnel can take whatever decisions they feel appropriate for that area. The definition of risk is not a criticism.

Q350 Jessica Morden: Thank you for raising that. We will go into that more later in the questions. Can I ask a basic question which you touched on earlier. What are the main fuel sources of biomass schemes in Wales?

Mr Price: We are certainly looking at reclaimed timber from the waste stream. I would emphasise that it is selective and it is clean. Then there is forestry waste. Beyond that, in terms of biomass, we have a chicken and egg situation where we could
build the plant if the fuel is available, and the fuel would be available if there is a plant to use it. It is very restrictive at the moment.

Q351 Nia Griffith: Following that, you are talking about 175,000 tonnes per annum in your submission. I am very encouraged by the idea that some of that would be presumably collected as separate timber in, say, local authority recycling centres and you would be picking up that timber. We know there are lots of coniferous areas in Wales where there is timber decay and the trees need managing. One feels that there is a finite end to it and one does not want to have the sort of situation we have had in Africa with mass deforestation. Where do you see the limits and how do you see the renewing of that source going on?

Mr Price: I believe that there is a mix of fuels for our projects. At the moment, so far as I am aware, there is in excess of one million tonnes of material that can be reclaimed from the waste stream across the UK. I would not, for a moment, expect to fire 175,000 tonnes from the local city in Cardiff. We are looking at a mix. Then, moving on to the replanting of trees, as time goes on, we would be seeking to work with the Forestry Commission to see how much of this material is grown as a crop. We can look at willow and all the others. The difficulty I have encountered, again going back to Somerset for the moment, is that vast acreages will be required if one solely addresses green and crop fuel. There has to be a mix of other materials. The technology that we are using is a very simple technology which will cater for such a mix.

Q352 Albert Owen: Can you give some examples of biomass schemes in Wales that have benefited from DTI initiatives?

Mr Price: My answer to that is no, but I will come back to you with that answer.

Albert Owen: In their written evidence they told us of these large schemes, the Wood Energy Business Scheme at £7 million and the Willows for Wales Scheme and the Bio-energy Capital Grant Scheme at £66 million, so there is a lot of money available. I am wondering if there are any projects in Wales that have been able to identify these grants. Are they just placer to go there. There is a good labour pool. There is a fuel source and very good road infrastructure. I could go to my shareholders and convince them that this is a good place to invest.

Q353 Chairman: Are you familiar in my constituency of Aberavon with a company called Western Logs which I believe has received some support from the DTI?

Mr Price: I am not familiar with that.

Q354 Albert Owen: Earlier you mentioned planning and some anecdotal evidence that you have, but is there a proper planning strategy as there is for wind for biomass? For wind we have the TAN 8 in Wales and there are technical assistance notices. Is there such a thing for biomass or do you go straight into the local mire of planning that every other controversial scheme goes into?

Mr Price: What a lovely description! Recently we have established a very good relationship with the Welsh Development Agency. I can sing their praises. They have been very helpful in guiding us through some of the difficulties with planning. They have supported us in many ways. Beyond that, we have to use our own judgment. We use a Welsh consultant for planning. Our own Planning Director is a Welshman and he understands the Welsh politics rather better than I do. In essence, we take soundings and if there is an enormously adverse reaction, then we would—

Q355 Albert Owen: The question I am really asking is: when it comes to the planning stage, is there a Welsh Assembly TAN for it, a systems notice?

Mr Price: I am not aware of that; I have not seen one.

Q356 Albert Owen: I move on to the Welsh Assembly Government’s Route Map, and I know they are producing this mid-2006, so it is due any time, and there are relevant targets. Are you aware of what those targets are? I am disappointed to hear that you are not sure how much of the 1.2% is made up in Wales. Presumably this route map will help you to get to a certain standard or level.

Mr Price: Yes, that is the case. We would look at that and follow the route as and when it becomes available.

Q357 Albert Owen: Are you aware of what the likely targets are? Has there been any consultation?

Mr Price: These are the likely targets for Wales for renewable energy?

Q358 Albert Owen: This is for biomass itself.

Mr Price: I have not personally seen any guidance on biomass.

Q359 Mrs James: So you have no indications of what the targets will be, nothing at all?

Mr Price: I do not have that for biomass in Wales. We are approaching it from a business perspective. As I said earlier, our shareholders are passionate about clean energy. I personally know that part of Wales very well. It is a site which has many advantages over other sites in Wales. It is a logical place to go. There is a good labour pool. There is a fuel source and very good road infrastructure. I could go to my shareholders and convince them that this is a good place to invest.

Q360 Mr Crabb: Could you tell us a bit more about the biomass projects you are currently developing in the Rhymney Valley?

Mr Price: There are two entirely absolutely distinct projects. One is where we have researched the market for co-fired fuel using wood pellets. We are looking at manufacturing biomass fuel, and that is basically wood-based. This would be produced from forest residues with green timber and be absolutely green and that is a ring-fenced business. We are looking at the markets. The Energy Review has, to some extent, reduced the attractiveness of that because there are uncertainties now created in the percentages of co-fired ROCs that will be permitted across the UK. It is a market, a business and an
opportunity. The wood pellet plant is completely ring-fenced and it is one separate business. Secondly, and more importantly from our point of view, we are looking at a biomass power generation facility. That is using wood and wood derivatives. We have developed a generic design which is 20 MW or just over net output. We have identified fuel sources for this plant. The objective, from my point of view, is to use that generic design and replicate it elsewhere in Wales.

Q361 Mr Crabb: On that note, have you identified further sites where you could replicate this project?  
Mr Price: Not in Wales. We are focused as a small company with limited resources and people. In order to get our first project off the ground and avoid the situation that I hit in Somerset, I want to focus first on getting that one up and flying and that will, of course, increase the credibility of Express Power. There are other sites in north Wales that the WDA have indicated to us would possibly be suitable.

Q362 Mr Crabb: To ensure a return for your shareholders, do you need to replicate the project?  
Mr Price: No. These are stand-alone businesses. Each one must stand on its own merits.

Q363 Mr Crabb: What more do you think the Welsh Assembly Government or the DTI could do to attract potential biomass developers to brownfield sites in Wales?  
Mr Price: Again, one looks at risk. The major risk is the planning risk and normal management techniques just cannot be applied to that risk. At the end of the day, we have to go to the planners. Sometimes it is a decision based solely on local politics and local interests. We are trying to accept the concerns of the local community and work within those concerns. We have already been offered support by the WDA but if it were possible to gain some support from the Assembly which could mitigate some of that risk, then I think the problem of development would become much easier.

Q364 Mr Crabb: That would essentially be to exempt you from local planning processes?  
Mr Price: I think “exemption” is probably the wrong word. We would all baulk at exemption if somebody wanted to build in his backyard, the NIMBY issue, but if there was encouragement and co-operation with the Assembly and with local people to ensure that the project was not intrusive, did create further jobs and was beneficial to the area, working together as a team, the Assembly and ourselves, we could create the biomass business which would not offend anyone.

Q365 Mark Williams: Can I probe you further on the Rhymney Valley projects? I think the biomass is on a very small scale and there are two or three in my constituency that fit into that category. What generation capacity do you envisage on the scheme there?  
Mr Price: It is 20 MW electrical, net.

Q366 Mark Williams: You mentioned job creation. How many jobs do you envisage being created as a result of the project?  
Mr Price: There will be of the order of 20 full-time quality jobs or what I would call direct employees running the plant and ensuring that it works. The lead spin-off jobs from that would probably be in excess of a further 40 jobs; that is in transportation, fuel management right down to the people who paint the fences and make the sandwiches. There are many spin-off jobs. They are solid. I cannot emphasise strongly enough that we are in the business for the long-term. We do not want to build these plants and simply be taken over by someone else. We are in it and we want to operate it and make sure that it is for the benefit of the community.

Q367 Mark Williams: You mentioned some of the frustrations of the planning system. How has this scheme gone down in the locality in terms, firstly, of the local authority? How much support have you had from the local authority planning department in the case of the Rhymney Valley and what engagement have you had with the local community?  
Mr Price: To deal with the fuel plant first, we were given permission to build on the B2 development, which is a continuous process, and that was encouraging. We still have to get detailed planning consent. We are confident we can get that. My Planning Director, Michael French, has discussed the power plant with the local authority, not formally because we needed to take soundings, and this is part of the process of taking soundings. Some concern was expressed but when we explained that we will always carry out a full environmental impact study and a full logistics study with the co-operation of the local authority, they seemed to relax a little bit. At this point, this is very preliminary. As of last week, I have issued an instruction to my colleagues now to pursue a formal route for a planning application for this project.

Q368 Mark Williams: What about your engagement with the general public in that area? You will appreciate that if a local authority is moving in one direction, it is not always in tune with the local community.  
Mr Price: We will engage with the local community. We did this previously in the one that failed. We will do that with public meetings and public discussions and anyone who has concerns can contact me or my two colleagues directly if necessary. That door is always open.

Q369 Mr Jones: You have mentioned the planning difficulties. What further requirements are there in terms of infrastructure, would you say, and also investment for the development of biomass in Wales?  
Mr Price: In terms of transport infrastructure, which is the one that usually concerns everyone, it is very close to the Heads of the Valleys road. A very
substantial road infrastructure already exists. The exit and entrance to the site exists and is already being used by a company called Evans Logistics.

**Q370 Mr Jones:** That is specific to your site. My question was wider. My question was: what are the general requirements in terms of infrastructure to facilitate the development of biomass in Wales?

**Mr Price:** I am sorry. Again, we would be looking for a very good road infrastructure. Wales does have the benefit of good quality roads where high levels of traffic can move without intruding on the area. The other infrastructure is the electricity infrastructure. The costs involved related to that will be taken into account in our budget costs for the whole project. The two major ones are to get the fuel in and to get the power away. The rest of it falls under normal management techniques.

**Q371 Mr Jones:** You recognise that road traffic and the power required for generation contribute to CO₂ emissions from biomass plants. With this in mind, can you tell us how you calculate emissions from biomass projects?

**Mr Price:** Yes. We use consultants called Atkins, which are the biggest consultants in Europe. In fact, some years ago for 10 years I was a director at Atkins, so we know them quite well. The actual calculations we carried out were done for me by Atkins. Do you want numbers?

**Q372 Mr Jones:** We are more concerned with how you calculate the emissions and emissions savings from a biomass project taking into account the CO₂ emissions from transport and generation?

**Mr Price:** I can circulate this but it is slightly out of date because it is a moving feast. We have calculated the CO₂ emissions from the number of vehicles that will be moving the material around; for example, anticipated traffic movements are 56,000 per annum. The CO₂ emissions from the power plant or the material to the power plant are 3,500, and from the other plant, because you have material in and material out, it is nearer 6,000. The actual savings involved in this or the net CO₂ reduction from the power plant is 65,000 tonnes per annum and from the pellet plant the saving in using biomass energy and coal-firing is about 25,000 tonnes per annum, so the total CO₂ reduction is about 90,000 tonnes per annum by using this material.

**Q373 Mr Jones:** In approximate percentage terms, what are the savings in emissions compared with a traditional fossil fuel plant? If you do not know the figures offhand, perhaps you could write to us.

**Mr Price:** Yes. I have here a calculation at the end of this report in round figures of an estimated 160 million tonnes of CO₂ per annum in the UK. The reduction that would be designated to our plant is 0.06%. I will get the actual figures from Atkins and forward those to you.

**Q374 Nia Griffith:** Our traditional image of wood is that it is smoky. What measures do you have in place in terms of filtering and so forth?

**Mr Price:** We have gone to extensive lengths to filter out particulates. Even though we are looking at using green fuel, we have actually built into our design the equipment for the plant that will make the plant comply with the Waste Incineration Directive. We will not need it for the material we want to use but if, in the future, things change and, for example, refuse-derived fuels or cleaned-up versions of it are classed as green energy or renewable energy, then we are putting in equipment which will actually handle that. We have no intention whatever at any time to burn refuse material. I thought it was prudent at this stage to install this equipment because to retro-fit it is technically extremely difficult and expensive. At the outset, it is a very much cheaper operation.

**Q375 Mrs James:** In section 4 of your written evidence you say that current OFGEM certification processes increase financial uncertainty and are a constraint on business development. Could you give us more detail on this, please?

**Mr Price:** Yes. There has been a move since I wrote that. When I prepared that note we were facing difficulty in getting accreditation for the fuel that we want to use; in other words, accreditation of renewable obligations certificates. At that time, the rule was that one did not get accreditation for this fuel until after the plant was constructed and commissioned. At that point, I would have spent in excess of £50 million on a project which would not necessarily have a guarantee of a revenue stream or a very much lower revenue stream. It is the support from the renewable obligations certificates that makes these businesses viable. I am aware now that that has changed. On planning consent, OFGEM are now prepared to indicate, though it is not a guarantee, that we would receive accreditation for the fuel. That will make life very much easier for investors to take a decision. I welcome that change in the rules.

**Mrs James:** I was going to ask you a bit about the ROCs but you have covered that in your answer. Thank you.

**Chairman:** Thank you very much for your evidence. If there is further evidence you wish to submit, and you have alluded to that, we would be very pleased to receive it.
Written Evidence from Dr John Valentine, John Clifton-Brown and Iain Donnison, Institute Grassland and Environmental Research (IGER)

1. **INTRODUCTION**

IGER, the largest single organisation carrying out non-medical bioscience research in Wales, is sponsored by the Biotechnology and Biological Sciences Research Council. The Institute exploits its basic research programmes through target driven research and the transfer of research outputs into the marketplace via collaborations with the private sector.

2. **SCOPE OF THE SUBMISSION**

IGER wishes to make comments relating solely to the use of biomass energy within a mix of renewable technologies within Wales in relation to term of reference 3, the current and future portfolio of energy provision in Wales.

3. **IGER’S INVOLVEMENT IN BIOMASS ENERGY**

IGER is co-ordinator of a pump-priming Objective 1 project (Helygi Gymru/Willows for Wales) on the development of sustainable heat and power fuelled by biomass from short rotation coppice willow in Wales. Industrial partners include RWE npower, EGNI, Mid-Wales Energy Agency and Anglo-Swedish SW companies. It undertakes the UK breeding programme funded by Defra for the giant grass *Miscanthus*, also aimed at improving the economic sustainability of the biomass supply chain. IGER is working with partners in combustion and fermentation technologies for biomass. This includes being a partner in the multi-million pound UK government and industry funded SUPERGEN programme which includes a range of academic and industrial partners including EON (previously Powergen).

4. **WHAT IS BIOMASS?**

Biomass is the product of photosynthesis, in which solar energy is converted to sugars. The source of carbon is carbon dioxide from the air. Biomass is a large resource worldwide and the No1 renewable in Europe. It is the only renewable capable of producing liquid transport fuels and on demand electricity.

5. **THE NEED FOR ENERGY CROPS**

It is clear from calculation of annual tonnages of biomass required for existing and proposed bioenergy projects (500–700,000t per annum) that the supply from forestry or waste wood will not be enough or sustainable. Energy crops will be required. The potential area for energy crops in Wales is over 1 million hectares. Significant substitution of fossil fuels could reasonably be achieved by planting 5–10% of grassland or arable with energy crops. Current yields of biomass are well below theoretical potential, and improving yield through plant breeding and the selection of adapted varieties will greatly improve the economics of the biomass supply chain. For instance, selecting varieties of willow that are more branched would intercept more solar energy which can be converted to biomass. Energy crops are more or less carbon neutral. This is because the carbon locked up through photosynthesis which is released at conversion to heat and power is replaced by new plantings. Biomass substitutes for fossil fuels and in addition carbon is sequestered in soil organic matter (10.4–15.0 and 1.3–2.6t CO₂ per hectare per year respectively). As perennial crops, energy crops have a low demand for pesticides and input energy. Inputs of energy are therefore small (1/30th–1/50th) in relation to energy outputs. Apart from energy and carbon abatement, the multi-functionality of outputs needs to be quantified in terms of different currencies or externalities, eg financial, C sequestration and greenhouse gas emissions, water resources and quality, prevention of flooding, biodiversity, landscape and countryside access.

6. **SUPPLY CHAINS**

Biomass supply chains are at a young stage of development in comparison with oil or wind. An analysis of what economies of scale and local availability could be achieved and over what time scale is required. The Helygi Gymru/Willows for Wales project has concluded that in relation to the biomass supply chain

(1) We should not be defeated by relative complexity
(2) Growers must have confidence in the market
(3) A one-stop advice centre is needed—this could be a real or virtual centre for R&D and advice (compare Organic Centre Wales)
(4) Fair and transparent production contracts are needed.
7. THE TECHNOLOGIES AND THE WAY FORWARD

In relation to the technologies, it is important to realise that while current 1st generation technologies such as co-firing, CHP based on combustion, bio-diesel from vegetable oils and bio-ethanol from wheat are relatively inefficient processes and are dependent on support, they represent the “foot in the door”. Experience in Sweden suggests that nevertheless, money spent generates new industries. Emergent 2nd generation technologies will be more efficient in terms of conversion efficiency and life-cycle analyses. These include the production of transportation fuels from ligno-cellulose, biorefinery to produce high value products and energy (an area in which IGER would like to see more research being carried out involving Miscanthus and the new high sugar grasses) and in the longer-term, hydrogen production from biomass.

30 November 2005

Witness: Dr John Valentine, Head of Non-Forage Crops Team, Institute of Grassland and Environmental Research (IGER), gave evidence.

Q376 Chairman: Good morning and welcome to the Welsh Affairs Committee. For the record, could you formally introduce yourself?
Dr Valentine: I am John Valentine, Head of the Non-Forage Crops Team within the Plant Genetics Department at IGER in Aberystwyth. I co-ordinate the Willows for Wales project, which is funded by EU structural funds, the Welsh Assembly Government, WDA and industry, and industry includes RWE npower who operate the Aberthaw power station and smaller energy service companies that are interested in small and medium scale generation. My team is also responsible for the Defra-funded UK breeding programme of miscanthus and we are involved in the SUPERGEN project as well.

Q377 Mark Williams: Dr Valentine, you have answered part of my first question, which was to give us more information on the work of IGER generally. Is there anything you want to add to that?
Dr Valentine: Yes. We are one of eight research institutes funded by the Biotechnology and Biological Sciences Research Council, and the only one in Wales. Energy is part of the multi-functional agricultural question that we are addressing. I think the strength of IGER lies in the fact that we undertake work from basic right through to strategic, target-driven research and research into the marketplace with the private sector. We have a strong commitment to communicate our research to beneficiaries and policy makers.

Q378 Mark Williams: In the written evidence you submitted you talked of biomass being the number one renewable in Europe. Can you give us some indication of the scale and variety of biomass projects across Europe?
Dr Valentine: It has been described as the sleeping giant of renewables in the world. At the moment, the EU gets 4% of its energy from biomass, but the EU Action Plan states that could be doubled by 2010 without the risk of significantly altering domestic food production. The potential for 2020 is three to three and a half times and the potential for 2030 is three and a half to four and a half times. Bulgaria and Romania have a proven availability as well within the EU because they have 0.7 hectares of land per capita compared with the EU 25 at 0.4. Imports into the EU offer still more. The EU Action Plan goes for a balanced approach for bio-fuels: bio-ethanol and bio-diesel. For instance, we can import some of the seven million tonnes from Brazil but we would have to make sure this was sustainable and would not cause deforestation.

Q379 Mark Williams: Notwithstanding the excellent research work that the Institute is undertaking, we are very much the junior partners in this across Europe in terms of realising the potential.
Dr Valentine: Yes, and that is partly because some of them have forested areas but countries like Sweden also want to grow low energy crops; they do not want to have to import any energy.

Q380 Mark Williams: In terms of the energy currently generated from biomass, how does Wales specifically compare with other parts of the UK?
Dr Valentine: We have to remember, is taking biomass as one large power station; that is taking a massive amount of biomass in its co-firing. It was material that was planned for the ARBRE scheme so that is a little bit ahead. In the UK there are all sorts of materials from forests, crop and food chain residues, energy crops and municipal solid waste and imports. I think municipal solid waste is more used in the UK at about 2.5 million tonnes. That is one-third the energy of coal whereas its energy crops are one-half of wood. That needs to be in special plants. There are real or perceived issues with health and the environment and whether they are recyclable. As far as Wales is concerned, I think energy crops are going to underpin the whole biomass area. They are more uniform. Ben Gill’s Biomass Task Force, to which we contribute, came up with a vision of one million hectares producing eight million tonnes of energy crop. In playing scenarios, it is a bit subjective value how much land that we devote. In Wales we have forests, forestry products and small round woods. I am not sure about the forest residues, the foliage, needles, and whether that would be better recycled into the soil, otherwise you take the nutrients out and you have a quality problem. I think there is a gap at the moment that has to be filled by energy crops.
Q381 Jessica Morden: In your evidence you say that current yields of biomass are well below the theoretical potential in Wales. Could you expand a bit more on what you think the full potential is?

Dr Valentine: Biomass energy is in the dry matter derived from trapping the sun’s energy through photosynthesis. At the moment, the average yield is about 8-10 tonnes. You can get 10 tonnes from wheat and that is only one little part of the plant. The potential is around 25 tonnes per annum. Of course these are much more efficient crops than wheat or oilseed rape because they are perennial and they recycle their nutrients. You do not have the costs of replanting every year with the giant grasses and the willow.

Q382 Jessica Morden: So you do think there is a huge future potential?

Dr Valentine: Yes. It was a Defra aim to double the yield of willow within 10 years. That would have a tremendous effect on the economics of the supply chain. Of course in the meantime I think the rising costs of oil and gas are having that push there.

Q383 Albert Owen: You mentioned the Biomass Task Force. Who are members of that and are you aware of what incentives are given to farmers to diversify to reach the potential that you talked about? I am not aware of it. I have had some briefings from the land and countryside owners and they are aware of this and have been trying to come up with something but there is not much of a take-up by the farmers. What are the disincentives that prevent that?

Dr Valentine: There are about 42 recommendations of the Biomass Task Force.

Q384 Albert Owen: Who is on that body?

Dr Valentine: It was led by Sir Ben Gill. David Clayton from Defra was on it and there was some industry input as well. Their reasons why biomass was not making a greater contribution were that there was ignorance of the potential, it was perceived as complex or high risk, a lack of policy clarity and a fragmented approach within government. They want governments to take ownership of this. There was too much emphasis on electricity and not heat and a lack of robust supply chains.

Q385 Mr Jones: Returning to your comments about biomass falling well below its theoretical potential, why would you say that is, whilst at the same time wind power, for example, has been aggressively exploited? Why would you say that biomass falls well below wind power in terms of its exploitation?

Dr Valentine: It is because wind was the low-hanging fruit. That was the technology of the Nineties and now biomass is getting to that situation. It is a more complex supply chain but nothing like as complex as the oil and petrochemical supply chain, which of course has taken 150 years to evolve. They even sell charcoal and logs on garage forecourts. You can see the complexity of that chain, biomass helps to make garages economic.

Q386 Mr Jones: Would it be fair to say that the exploitation of biomass as a fuel is suffering because of the aggressive exploitation of green power?

Dr Valentine: No. I think there is a realisation that there is a limit to wind and now it is biomass’ turn, as it were.

Q387 Mr Crabb: Are you satisfied that the Assembly and the DTI have developed an appropriate strategy for biomass?

Dr Valentine: The Assembly set up a woodland biomass development within 2001, and got it going in 2002. A lot of what was recommended has happened, but in the meantime some of it has not and a new reformed steering group has been set up chaired by the Forestry Commission which is going to look at priority areas to take forward. What needs to be done is for the industry to be given confidence. One other thing is that they have had planting grants in England of £1,000/hectare for willow and miscanthus and we have only had planting grants under the Woodland Grants Scheme, 600 hectares for willow and nothing for miscanthus. That is now in the Rural Development Strategy which is out for consultation but energy crops get £1,000 planting grants for a limit, in the first instance, of 9,000 hectares. One hopes that does not disappear because I think we do need to diversify. This is not really a subsidy in the old sense. Sir Ben Gill’s report pointed out that it is really there to move the market in one direction to induce change and that is a satisfactory thing to do.

Q388 Mr Crabb: Friends of the Earth told us that biomass could be more vigorously promoted and encouraged by the Assembly Government. Would you agree with that sentence?

Dr Valentine: They have not got a target yet. I think we need to work towards targets. I have my own idea there. To put it the other way round, biomass lacks a voice. It needs one voice that the Assembly can turn to and talk to rather like it talks to the Forestry Commission.

Q389 Mr Crabb: If you were Head of Energy with the Welsh Assembly Government, what would you be doing to promote biomass to give confidence, as you have just said?

Dr Valentine: I would set targets, but of course it is more than government action. I would do things to induce confidence. In my own project we are demonstrating the technologies. We have to give farmers confidence with the grant. If we are to make progress, and co-fired is one big win in the coming years, and if we are not to miss this opportunity we need to make sure that there is sufficient planting next year. Farmers will have to be signed up for that in October so that we do not go more than a year behind. The end users then will have to provide contracts and say that they will buy this material. You cannot expect people to do it on spec. I think we need greater advice within Wales. It is very hard at the moment for individual farmers to set up biomass on their own. It is everybody really, not just government.
Q390 Mr Crabb: Friends of the Earth also highlighted two instances where biomass projects were defeated in the planning application stage, having aroused considerable public opposition. What are the planning procedures for projects of this kind? What do you understand in the planning process?

Dr Valentine: I do not understand a lot of the detail but one would hope that the new TAN 8 document would indicate the permitted developments there and that would ease the situation.

Q391 Mr Crabb: So there is a planning strategy being put in place for biomass similar to what was done for wind?

Dr Valentine: Yes, largely; it has been set out in terms of wood fuel. The rest of the world uses the term “biomass”. I am not sure why TAN 8 in its main part uses the phrase “wood fuel” but one would hope that would have a large effect.

Q392 Mark Williams: We understand that the Welsh Assembly Government’s Energy Route Map will identify relevant targets by 2006. Have you any indication of what those targets will be?

Dr Valentine: No, that is up to this new steering group to do. We need to get on to it fairly quickly. You have to look at it in terms of the resource which is available and there are about 67,000 hectares of arable land in Wales, 184,000 pastures under five years old, and there is permanent grass of one million hectares. You can take 5, 10 or 20% of that. I think that Wales could set itself a target of 100,000 hectares of biomass using one-tenth of the grassland and arable areas in Wales from energy crops and that would produce one million tonnes of biomass per annum by 2020. I work that out as coming to 10.9% of the Wales’s electrical needs. This is a larger figure than that given by Kevin Mowbray. I gather that Kevin’s figure included transport fuel in it. This is the consumption of electrical generation.

Q393 Nia Griffith: That is an important point. Up to now we have been talking about plants being used for generation of electricity. Do you have a view on whether that is actually the most effective use of biomass products or whether we should not be looking more at the translation directly into vehicle fuel as perhaps a more useful use of it?

Dr Valentine: I think it is the kick-start that will get it going. Aberthaw’s planned co-firing is the biggest requirement at 35 MW. You are quite right; co-firing and bio-diesel and bio-ethanol are just first generation technologies, and there is little room for improvement on those, but we have combined heat and power which uses the heat. It is a kick-start and, as in Denmark where you have these bio-diesel type things, it is more profitable. If you can make the turbines as well, many ancillary industries will grow up too, and that is very important. As I say, combined heat and power is more efficient. A lot of research in the world is going into transforming woody biomass into transport fuels, which is much more efficient than getting it from wheat or oilseed rape. IGER is very keen on that, and that is second generation technology. Beyond that, there is the bio-refinery concept where you take an added value through the derivation of platform chemicals and you get bio-ethanol and material for combustion. We have bred high sugar grasses there and it is something we are very keen on.

Q394 Mark Williams: Dulas Limited has informed us that the role of biomass in the Energy Route Map was downgraded because of the unfavourable economics of biomass. Could you give us some background on the economics of biomass? I think you have covered that in some of our answers.

Dr Valentine: Yes. It is more profitable now. We have worked out what it will cost over an 18-year spell and it is profitable. It allows farmers to diversify and do something else as well. A lot of the costs are up-front. I think it is important to understand that and have some grants and there are economies of scale and local supply. We have had to bring in machinery from Yorkshire to plant and cuttings grown in Sweden and in Yorkshire. We need local materials to arrive at these sorts of things.

Q395 Chairman: Could I ask you some questions about the way ahead, so to speak? You mentioned that fair and transparent production contracts are needed. Does this statement reflect concerns you have with the current contracting procedures?

Dr Valentine: Yes, and a lot of materials at the moment are produced and sold as commodities. I think that would be very difficult for biomass. Farmers, the intermediary and the end users have the security then if they offer contracts where they each recognise the other’s part in the supply chain; costs are known, they are not gambling, and they can specify quality needs as well. I think these relationships need to be built up.

Q396 Chairman: You also mention that a one-stop advice centre is needed for research and development advice in biomass. Could you explain why that is needed?

Dr Valentine: I think that there is a lot of information on biomass spread over a wide range of expertise and no one person knows it all. That information has to be got over. Rather like the Organic Centre Wales, it could be a virtual or it could be real centre and it could also provide the voice to the Assembly. The Organic Centre Wales has a core staff and it is run by a partnership between ADAS, Elm Farm, the Institute of Grassland and Environmental Research (that is us), the University of Wales and the Soil Association. They co-ordinate matters and they also disseminate information but there is education policy and strategy development within that. I believe there are five co-staff members to that and it has done a tremendous job for the organic sector in Wales.

Q397 Chairman: Finally, we have seen some press cuttings recently suggesting some job losses in IGER. Could you give us some information about the present situation there?
Dr Valentine: Thank you for giving me that opportunity. The Institute was notified late in 2005 of significant cuts in Defra’s budget for Sustainable Food and Farming. The way this works invariably fall on those contracts up for renewal rather than across the board. Therefore, it seems to have hit the dairy, beef and grazing science work. That has left IGES with a £2 million deficit in 2006–07, which would mean 40-odd plus jobs would be lost across research, technical support and administration. That could have a dramatic impact on the pipeline from molecular to meat. I think, in terms of the importance of the work, our vision is for a ruminant system based on high forage diets, reduced fertilizers and environmental benefits giving healthy milk and meat. That improves nutrient efficiency, leading to low pollution and high product quality. One challenge is the protein-rich legumes and that is a renewable source of nitrogen fertilizer and it lessens the amount of nitrogen extruded into the air. The work was aimed at producing high antioxidant beef and healthy beef from forage fed animals. There is an interconnection again with that work and global energy. Knowledge of what the bugs can do in the rumen can be transferred to fermentation to produce methane and bio-ethanol and we have recently found using a simulated cow’s rumen that if we feed them high oil oats we can decrease the amount of methane released by the ruminant, tremendous quantities, and that is a much more serious greenhouse gas than carbon dioxide. There is a 35% reduction in methane from feeding high oil oats compared to wheat. We have only measured it in bottles so far, so we will hope that that could be taken up.

Q398 Mark Williams: You have mentioned your background on the position with the Defra contracts between dairy and grazing. This Committee has just returned back from America where we saw the huge results, on-going research work, from the Department of Energy in America, it is really just to elucidate that a bit more. What you are telling us is there are huge potential research projects that could be run from IGES which would actually lead to expansion rather than contraction that we are currently facing. Dr Valentine: Yes, there are so many challenges with sustainable food and farming that we should not be cutting it. Is sustainability just a short phase, or are we over that era. I know that Defra are redirecting a lot of funds to climate change, and quite understandably so, but this is also an important area which impacts on the environment and human and healthy beef from forage fed animals. There is an interconnection again with that work and global health and sustainability in general.

Q399 Chairman: Thank you, Dr Valentine. If you feel that you wish to add anything further to us, or the evidence that you have given to us, please send it in as a separate entry memorandum.

Written Evidence from Friends of the Earth Cymru

Friends of the Earth Cymru inspires solutions to environmental problems, which make life better for people.

Friends of the Earth Cymru:
— is dedicated to protecting the environment and promoting a sustainable future for Wales;
— is part of the UK’s most influential environmental campaigning organisation;
— is part of the most extensive environmental network in the world, with over 60 national organisations across five continents;
— supports a unique network of campaigning local groups working in communities across Wales;
— is dependent upon individuals for over 90% of its income.

1. UK Government Energy Policy in Relation To:

(a) the current and future energy needs of Wales; and
(b) the current and future provision of energy in Wales.

The UK Government’s recently announced energy review—“A Secure And Clean Energy Future”—will assess progress against the four goals set by the 2003 Energy White Paper. These are:
— to put ourselves on a path to cut the UK’s carbon dioxide emissions by 60% by 2050 with real progress by 2020;
— to maintain the reliability of energy supplies;
— to promote competitive markets in the UK and beyond, helping to raise the rate of sustainable economic growth and to improve our productivity; and
— to ensure that every home is adequately and affordably heated.

We believe that this inquiry should be set within this framework but that energy policy, and policies in areas such as transport, must now be primarily driven by the overriding need to reduce carbon dioxide emissions. Climate change is now the overarching issue that will increasingly have a major impact on global and local economic, social and environmental well being.

Climate Change

Since 1997, carbon dioxide emissions in the UK have risen by 5.5%\(^3\) and are continuing to rise. This is occurring despite a commitment by the UK Government to reduce these emissions by 20% on 1990 levels by 2010, and despite recent alarming scientific evidence that the effects of human induced climate change are happening earlier and more severe than anticipated.

On 11 August, the *New Scientist* reported that research by scientists from Oxford University and Tomsk State University in Russia had recorded the melting of an area of Siberian bog the size of Germany and France combined and that this threatened to unleash billions of tonnes of methane, a potent greenhouse gas, into the atmosphere. On 29 September, the BBC news website reported that scientists from the National Snow and Ice Data Centre at the University of Colorado had identified a record loss of sea ice in the Arctic indicating that the Arctic has entered an irreversible phase of warming that would accelerate the melting of the polar ice that has helped to keep the climate stable for thousands of years. And in October, scientists from Cranfield University reported in *Nature* magazine\(^7\) that soils in Britain are no longer acting as carbon sinks but, due to rising temperatures, are releasing huge quantities of carbon dioxide to the atmosphere. All these are regarded as probable “tipping points” beyond which change is irreversible.

In Wales, carbon dioxide emissions have risen by 0.2% since 1990 while emissions in England, Scotland and Northern Ireland declined by just 6.9%, 7.7% and 3.4% respectively\(^3\). Whilst Wales has the poorest record, all these figures are disappointing as the UK should have achieved much greater reductions by now in order to meet the UK government’s target of a 20% cut on 1990 levels by 2010. The Welsh Assembly Government’s target of a 20% cut in carbon dioxide by 2020 will also be missed on current trends.

Although emissions in Wales of the overall basket of six greenhouse gases—carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride—were an estimated 3.6% lower in 2003 than they were in 1990, they are worryingly adrift of the target figure of a 12.5% reduction. They are also substantially less than that achieved by England (15.9%) and Scotland (10.1%)\(^4\).

It should be noted that much of the reduction in emissions of greenhouse gases have been achieved coincidentally as a result of changes in industrial and agricultural practices rather than as a direct consequence of climate change policies. The decline in coal mining and manufacturing and the reduction in livestock numbers on farms have all had a significant impact. Methane emissions in Wales, for instance, declined by 34.5% during this period as a result of these factors, as well as the introduction of methane capture technologies on landfill sites\(^2\). Sometimes, relatively simple measures have achieved substantial reductions in emissions of the greenhouse gases other than carbon dioxide. Emissions of perfluorocarbons declined in Wales by 78% during this period because of improved control measures in the aluminium industry and, in England, nitrous oxide emissions fell by 40% as a result of the installation of abatement measures in one adipic acid plant\(^6\). Achieving reductions in the emission of the main greenhouse gas, carbon dioxide, is the main challenge and, in this, Wales is failing badly.

One reason for the higher level of greenhouse gas emissions in Wales compared to the rest of the UK is the preponderance of industry. According to the Carbon Trust in Wales\(^2\), industrial activity per head of population in Wales is approximately two and half times the UK average. And, the Assembly’s Economic Development Committee’s consultation report on renewable energy (April 2002) stated that 42% of gas supplied to Wales is to industry compared to 27% in the UK.

It is against this backdrop that current and future energy needs and provision in Wales ought to be assessed.

Energy in Wales

The Carbon Trust data\(^8\) shows that, in 2002, Wales used 130 TWh of energy and that this generated 34 million tonnes of carbon dioxide accounting for over 75% of Wales’ greenhouse gas emissions. Industry was the largest consumer of energy (42%) followed by the domestic sector (24%), transport (23%) and the service and public sector (11%). These data show a huge dependence on fossil fuels with just under 2% of Wales’ total energy needs coming from renewable sources. In the UK, nuclear power is estimated by the DTI\(^9\) to have contributed 3.2% to total energy demand but in Wales this proportion is slightly higher at around 5% because of the 30% contribution of Wylfa nuclear power station to electricity generation in Wales.
The Carbon Trust study also shows how dependent Wales is on imports to meet its energy needs. All of the oil, gas and uranium and over half the coal used in Wales is imported. Most of the oil is exported after refining while a small proportion of the electricity and coal is also exported. Although Wales is, overall, a net exporter of electricity, it has to import power to south Wales with the result that consumers there pay higher prices for their electricity. Over half the energy content of the coal and uranium ore and approximately half the energy content of gas is lost in the process of generating electricity\(^\text{10}\). According to the DTI’s “UK Energy Sector Indicators (2005)”, UK electricity generators lose all but 38% of the energy of their fuel through inefficient technologies while further losses occur as a result of transmission and distribution.

It can be difficult to obtain detailed up-to-date energy data for Wales. We suggest that the Assembly’s Statistical Directorate attempts to plug this gap in order to facilitate the formation and delivery of energy policy in Wales.

Security of Supply

The issue of security of energy supply has been widely raised recently, particularly in relation to both the supply of gas, as North Sea resources diminish and the UK becomes more dependent on imports, and to the closure of ageing nuclear and coal-fired power stations. The Prime Minister, in an attempt to justify a new consideration of the role of nuclear power during his Labour Party conference speech, warned of our energy supplies being dependent on “some of the most unstable parts of the world”. The Energy Minister, Malcolm Wicks, pointed out, when announcing the Energy Review on 29 November, that by 2020 the UK is likely to see the decommissioning of coal and nuclear plants that contribute about 30% of the UK’s generating capacity, and, that the UK is now a net importer of gas as North Sea production has declined quicker than predicted. In Wales, this has been reflected in calls to consider nuclear new build to replace the closure of Wylfa nuclear power station in 2010, developments to import LNG through Milford Haven and proposals to drill for gas in the Irish Sea.

The Minister pointed out that world prices for fossil fuels have increased by more than 50% over the past three years and that these prices had fed through to higher energy costs for homes and businesses. Although domestic electricity prices are still 10% lower in real terms compared to 1997 and industrial fuel prices halved in real terms between 1980 and 2004\(^\text{11}\), fossil fuel prices are expected to rise in the future as a growing demand is confronted by limited resources.

The Minister also touched upon fuel poverty pointing out that four million households had been lifted out of fuel poverty in the UK since 1997 but that a million remained, and recent fuel price increases could have increased that number by 400,000. According to the Welsh Assembly website, there are 220,000 households suffering from fuel poverty in Wales.

Although we need to keep energy security issues at the front of our mind, we should not overstate any threat so as to promote unsustainable technologies such as nuclear power. According to the DTI\(^\text{12}\), the chief supplier of piped gas to Britain in the foreseeable future will be Norway which, along with the Netherlands, has around 4 trillion cubic metres of gas reserves. As nuclear power is a costly and hazardous technology that contributes just over 3% to total UK energy demand, we see no role for it in meeting future energy needs in the UK. The most sustainable and sensible response to the energy security challenge would, in our view, be to vigorously promote energy efficiency, more actively harness the UK’s resources of renewable power, and ensure maximum efficiency from existing fossil fuel generation. More details of these options will be provided in section 3 of this submission.

We are pleased that the Welsh Assembly Government’s Energy Route Map consultation document (see Appendix 1 for Friends of the Earth Cymru’s response to this) reflects a similar approach to Friends of the Earth Cymru. The Route Map’s vision is to make Wales a showcase for clean energy whilst maintaining international competitiveness. It recognises “that this will primarily be achieved in the short to medium term through an increased role for highly efficient gas and coal stations and renewables in the energy mix as well as greater emphasis on energy efficiency”. Whether this can be achieved will depend, to a large extent, on the relationship between the UK Government and the National Assembly for Wales on energy policy.

2. The Relationship between the UK Government and the National Assembly for Wales—Including the Division of Powers—on Energy Policy

While responsibility for energy policy in the UK is reserved to the DTI, a number of areas relating to energy policy are devolved to Wales. These are:

- environment policy;
- support for innovation;
- housing;
- planning (apart for power station consents over 50MW); and
- control of the budget for energy efficiency schemes in Wales eg The Home Energy Efficiency Scheme (HEES) and part of the activities of the Carbon Trust.
The Welsh Assembly also has a world leading remit to promote sustainable development that takes into account energy issues.

The areas not devolved are:

- promotion of renewable energy;
- promotion of energy efficiency;
- building regulations;
- power station consents (over 50MW); and
- overhead electricity line and gas pipeline consents.

Despite the lack of devolved powers on energy policy, the Welsh Assembly has attempted to play a significant role in this area. As the Richard Commission points out in its consideration of economic development policy:

"The boundary between devolved and non-devolved issues did not appear to pose a problem, with the Assembly Government seeking to work with and influence Whitehall and businesses on non-devolved issues such as energy and telecommunications." [Ch 5 Para 74]

In April 2000, the First Minister agreed that, in order to inform the creation of a realistic energy framework for Wales (a betterwales.com commitment), a strategic study into the potential for renewable energy developments over the next decade should be undertaken. This was produced in January the following year. In March, the chair of the Economic Development Committee recommended that it should undertake a review of energy policy based on “the Assembly’s responsibility to promote sustainable development whilst facilitating economic growth and development”. A wide range of expert witnesses presented evidence and, following consultation, reports on renewable energy (April 2002) and energy efficiency (April 2003) were produced.

Both reports attempt to steer Wales towards becoming “a global showcase for clean energy developments and energy conservation”, a vision set out in the Assembly Government’s national economic development strategy, “A Winning Wales” (January 2002). They reflect UK national energy strategy by, for instance, setting a benchmark of generating approximately 4TWh per year, amounting to just over 10% of Welsh electricity production, from renewable sources by 2010, and supporting the UK government’s targets for energy efficiency. They also favour increasing the powers of the Welsh Assembly by, for instance, calling for a non-statutory “Green Dragon” energy efficiency certificate for buildings in Wales that would be above normal building regulation standards, and, seeking an extension of its powers to approve power generation facilities over 50MW under the Electricity Act 1989.

We believe that the Welsh Assembly should be given the powers to both establish more stringent building regulations for Wales and to decide on power station consents over 50MW.

These powers are necessary if Wales is to realise its vision of being a global showcase for clean energy. The Welsh Assembly’s limited powers on energy efficiency could be significantly enhanced by it being granted authority over building regulation standards. And it certainly does not help the Assembly develop “safe, clean and secure energy supplies” if decisions are seen to be taken by one minister based at the head of the DTI in London, as happened in the case of the Cefn Croes wind farm application.

The Richard Commission points out that the Economic Development Minister, Andrew Davies, identified two specific areas in which the Assembly Government’s objectives had been constrained. One of these was the power to decide on proposals for power stations above 50MW. The report states:

“Although the Assembly can regulate the development of small power stations (including wind farms), the Department for Trade and Industry retains responsibility for power stations with a generating capacity of over 50MW in Wales (but not in Scotland). The Assembly Government has requested the transfer of these specific energy powers to Wales.” [Ch 5 Para 75]

In chapter 9, on the boundaries of devolution, the report considers the Cefn Croes wind farm application, which Friends of the Earth Cymru supported, in more detail. It points out that the Assembly “had played no formal part in the decision making process”. It compares Wales to Scotland where, although the UK parliament retains the right to legislate on energy matters, the executive functions relating to the approval of large electricity generating stations have been transferred to Scottish ministers.

The Minister told the Commission:

“"We feel it would be much more in line with our major policy areas, like energy production and renewables, if we had the power to deal with applications over 50MW. “ [Ch 9 Para 26]

The Minister also considered that there would be economic benefits from the transfer of these powers because it would make it easier for Wales to secure more indigenous power. Electricity costs in South East Wales were around 7% above the UK average because of the shortage of local generation.

According to the Commission, the UK Government believes that the integrated nature of the electricity supply system and markets—where North Wales forms part of the Merseyside distribution network and South Wales is linked to South West England—prevents this transfer of power. It should be noted, though,
that a similar situation exists with regard to transport routes yet transport is a devolved policy area. There is a suspicion, referred to by the Commission [Ch 9 Para 30], that Whitehall might be hanging on to these powers in order to retain control over decisions on nuclear energy generation in Wales.

The Richard Commission suggests a way forward. It states:

“Wales could be given a stronger role in the decision-making process under the current legislation even without transferring these powers. This would be achieved by the Secretary of State exercising her right to leave the planning aspects of such development to be considered by the relevant planning authority (the local authority unless the Assembly decided to call it in).”

We are disappointed that, considering the strength of feeling in Wales over this issue, that this has not happened.

A broader vision of how Wales could become “a global showcase for sustainable clean energy” was set out by the Economic Development Minister in an energy statement to the Assembly on 26 February 2003. In this, the Minister outlined five priority policy areas, as follows:

1. Pursuing now much greater energy efficiency, including small-scale on site CHP (combined heat and power) and renewable plants in our domestic, business and public sector, working in partnership with local authorities. The Minister noticeably added that “we are seeking a transfer of some Building Regulation powers” and that they were intending to produce a Wales energy conservation action plan.

2. A strong drive in Wales now, against appropriate benchmarks, for a sustainable mix of renewable energy developments. The Minister indicated that he would approve the benchmark recommended by the Economic Development Committee. He also stated that a new Technical Advice Note (TAN 8) was being developed to ensure an integrated approach to planning. Rather surprisingly, the Severn Barrage proposal, which has been strongly opposed by environmental groups, is flagged up as a “desirable” project.

3. Encouraging energy infrastructure improvements and pressing for reform of electricity trading arrangements. Particular reference is made to strengthening gas transmission infrastructure to transport gas from proposed LNG terminals in West Wales.

4. Encouraging now the production in Wales of electricity from new clean coal power stations. Coal gasification and carbon sequestration technologies are regarded as promising.

5. The setting of achievable and measurable carbon dioxide reduction targets for 2020. This is set at a 20% reduction by 2020, reflecting the UK government’s target of a 20% reduction on 1990 levels by 2010.

The Minister believed that “this energy mix will mean that we have secure, diverse and affordable energy whilst meeting environmental commitments without any new nuclear power generation in Wales in this time frame”. This energy statement was set out, as the Minister stated, “against the background of the UK Energy White Paper” which had just been published.

The Energy White Paper states, in Section 9.18:

“Our will continue to work closely with the Devolved Administrations on energy policy objectives. We are encouraged that the Devolved Administrations are developing strategies and targets on devolved aspects of energy policy.

“Renewable energy, CHP and energy efficiency opportunities have already been examined in depth by the Welsh Assembly’s economic development committee and are being supported within the EU Structural Funds programmes. Against this background the Welsh Assembly Government and relevant agencies are strongly pursuing an increasingly active clean energy/energy-conservation strategy which will be further boosted in the light of developments described in this white paper.”

Since the publication of the White Paper, the Welsh Assembly Government has moved energy issues forward by producing an Energy Efficiency Action Plan (February 2004), TAN 8 - Planning for Renewable Energy—and the accompanying Ministerial Interim Planning Policy Statement (July 2005), and the Energy Route Map consultation document (June 2005). A number of energy actions are also referred to in the Sustainable Development Action Plan (October 2004), the Wales Spatial Plan (2004) and the draft Environment Strategy (2005).

A brief look at the Assembly Government’s energy efficiency plan gives an indication of the difficulties that arise as a result of the lack of devolved powers on the issue. We have been critical of the Energy Saving Wales believing it to be long on generalities, short on specifics and doing little more than reiterating standard energy efficiency advice that has been available for years and which has failed to reverse the increase in energy use. In a number of ways, it compares unfavourably with the UK Government’s energy efficiency action plan produced by DEFRA. This, for instance, contains far more detail and sets targets of saving 4.2 million tonnes of carbon in households, a 29% reduction in carbon emissions from central government buildings and a 5.8 million tonne reduction in the business sector by 2010. By comparison, no targets or timetables for delivery are set in Energy Saving Wales. It is regrettable that, according to the Sustainable Development Action Plan, “the Assembly Government, its agencies and the NHS in Wales” will only “report annually on the use of energy in its estates” rather than set a target of cutting carbon emissions by 29% as stated in the DEFRA action plan. With the National Assembly’s commitment to sustainable development, one would have expected it to be ahead of the UK Government on a policy that so clearly embodies the environmental (reduced greenhouse gas emissions), social (less fuel poverty and ill health) and
economic (lower fuel bills and more jobs) benefits of sustainable development. Had energy policy been devolved to the Welsh Assembly, the Welsh Assembly Government would have been in a position to take more effective action to improve energy efficiency and conservation.

The lack of devolved powers on energy policy means that, in Wales, it amounts to little more than a mirror image of UK Government policy. The efforts of the Welsh Assembly to give this policy a strong Welsh dimension are to be welcomed but these efforts are unlikely to be sufficient to enable Wales to achieve its aim of becoming a “global showcase for clean energy developments and energy conservation”. At present, we seem to be acting out a pretence of delivering an energy policy when Wales does not in fact have the powers to do so. It is difficult to understand why important policy areas, such as economic development, transport, health and education, have had the power of executive competence (as opposed to the power to make primary legislation) devolved from Westminster to the Welsh Assembly while a key issue such as energy has, by and large, not. We believe that, if Wales is to develop a distinctive energy policy that will enable it to become a world leader in clean energy, the transfer of these powers is essential.

3. THE CURRENT AND FUTURE PORTFOLIO OF ENERGY PROVISION IN WALES, INCLUDING:

(a) Nuclear Energy

Friends of the Earth Cymru opposes the construction of a new generation of nuclear reactors because a range of safer, greener and cleaner alternatives can deliver greenhouse gas reductions and maintain energy security.

We believe that the risks of nuclear far outweigh the benefits:

— Nuclear power produces waste that stays dangerous for tens of thousands of years. The Government still doesn’t know what to do with this waste.
— Nuclear reactors have and may again be threatened by terrorists. Attacks, for example by hijacked airliners, could pollute large areas with radioactive materials.
— Many processes used as part of nuclear power generation can also be used for covert weapons programmes. If the UK chooses to use nuclear power to cut its greenhouse gas emissions, it will provide an excuse that other countries may use to justify what are really weapons programmes.

In 2004, nuclear power generated 19% of UK electricity output13. In Wales, nuclear power is estimated to contribute 30% of the electricity and just over 5% of total energy. It was disappointing recently to see two organisations, CBI Wales and Wales TUC, make the mistaken claim, in their responses to the Energy Route Map consultation, that nuclear power provided 30% of Welsh “energy” as opposed to “electricity”. This is a basic error that significantly overstates the ability of nuclear power to play a meaningful role in achieving energy security and reducing carbon dioxide emissions.

We believe that a combination of affordable, innovative renewable energy solutions together with sensible measures to improve energy efficiency and the efficiency of coal and gas-fired power plants, means the electricity sector can deliver its greenhouse gas targets, and keep the UK’s lights on. Nuclear power is not needed.

What are the alternatives?

— Government estimates show we can save 30% of the energy we use through cost-effective energy saving measures alone. This would save the UK £12 billion every year and cut emissions14.
— There are more than enough theoretical renewable energy resources, such as wind, tidal, wave, solar and bio-fuel energy, to meet all of Britain’s needs. The Energy Review (2002) estimates, on page 86, that “renewables could be among the most cost-effective options for reducing carbon emissions” and could “by 2050 provide very large quantities of electricity”. In Wales, the potential is also significant. Existing and proposed onshore and offshore wind farms could generate over 25% of Wales’ electricity demand within six years15. Tidal lagoons in Swansea Bay and the Severn Estuary, subject to an acceptable environmental impact assessment, could double this contribution from clean renewable sources within the time it would take to build a new nuclear power station. Large lagoons could also generate or store power at any time. This capability would contribute significantly to replacing fossil-fuelled spinning reserve for grid balancing. Smaller contributions to our electricity needs could also be obtained from energy crops and wave, solar and other “free flow” tidal power schemes.
— All the major renewable technologies and energy efficiency have shorter timescales for implementation than nuclear. New nuclear reactors take at least 10 years to build but gas-fired plants can be built in three and renewables in one to three. Any small-scale measures, like micro-CHP, can be installed in weeks16. The developers of the tidal lagoon proposal estimate that the Swansea Bay scheme could be “up and running within 18 months to two years”17.
— A UK programme to replace inefficient light bulbs with new super-efficient LED or compact fluorescent light bulbs could save 7 TWh or 1.75% of UK electricity use by 2020. This is the equivalent of one nuclear power station18.
Introducing new standards to ensure appliances waste less electricity on stand-by could save 8 TWh or 2% of UK current electricity use by 2020\textsuperscript{19}.

Promoting more efficient electric motors in industry could save 24 TWh or 6% of UK electricity use by 2020. This is equivalent to three nuclear power stations\textsuperscript{20}.

Encouraging UK households to generate their own electricity through small gas-fired combined heat and power (CHP) boilers, solar panels and micro wind turbines could generate 18 TWh or 4.5% of current electricity needs by 2020. This is equivalent to more than two nuclear power stations\textsuperscript{21}. If 750,000 homes in Wales install micro-CHP by 2020 (the UK replacement rate is approximately 1.3 million central heating boilers a year) then the overall electricity output of the boilers would be equivalent to 10–15% of Welsh electricity demand, or 2.25 to 3 TWh a year in Wales\textsuperscript{22}.

Further developing the potential to use the waste heat given off by industrial plants, and other heat sources in the UK could generate up to 125 TWh\textsuperscript{23}. Waste heat from oil refineries in Gothenburg, for instance, provides a third of the city’s space heating\textsuperscript{24}.

Costs

Nuclear power has always been costlier than promised and has always had to rely on public subsidies. Many of the costs of a nuclear plant are hidden in the waste disposal, insurance and security costs.

It is currently estimated that the cost of nuclear waste disposal will be around £56 billion, according to the Government’s Nuclear Decommissioning Authority (NDA). This is an increase of £8 billion over previous estimates.

The Government’s rescue of British Energy in 2003 is expected to cost British tax payers £12 billion over the next 100 years\textsuperscript{25}.

Since 1974 the UK government has spent £6.8 billion in research and development funding for nuclear fission (compared to £540 million for renewables) according to information from the International Energy Agency.

Potential Contribution of nuclear power

Nuclear power is not the answer to climate change as its potential contribution has been overestimated.

If we doubled the electricity generation from nuclear reactors (from a quarter to a half of our electricity) we would only reduce greenhouse gas emissions by about 8%.

Nuclear is not an “emissions free” solution. The mining and transport of uranium, the making of nuclear fuel rods, the building of nuclear power plants and the storage and reprocessing of nuclear waste all lead to carbon dioxide emissions. Nuclear produces 50% more greenhouse gas emissions than wind power\textsuperscript{26}.

Given the appropriate support, renewables can make a significant contribution to carbon reduction in a much shorter timescale than the 10 years it takes to build the first of a new generation of nuclear reactors.

Waste

No long-term solution has been found for safely storing and protecting this extremely hazardous material for tens of thousands of years.

Britain has 470,000 cubic metres of waste—enough to fill the Royal Albert Hall five times—for which there is no agreed long-term management solution.

Nuclear waste can remain highly radioactive and dangerous for tens of thousands of years.

The Government can’t show that waste might not leak from proposed waste dumps. They can’t possibly predict how secure waste dumps will be over tens of thousands of years. In May of this year, it was revealed that 83,000 litres of a nuclear liquor, reportedly containing enough plutonium to make 20 nuclear weapons, had been leaking undetected for at least nine months from a badly designed pipe at the Thorp reprocessing plant in Cumbria.

If spent fuel rods were buried around the time of the Norman Conquest 1,000 years ago, they would still be highly dangerous today.

The Swiss Government’s nuclear waste authority assumes that the safety of the repository for spent fuel and high-level radioactive waste has to be guaranteed for at least one million years.

A proposal to store nuclear waste at a former military depot at Trecwn in north Pembrokeshire in 1998 triggered very strong opposition throughout west Wales.
Nuclear Weapons

Technology used for nuclear power can be misused to make nuclear weapons.

- Nuclear reactors use enriched uranium, made at enrichment plants. Yet enrichment plants can be used to make super-enriched, weapons-grade uranium.
- Reactors produce plutonium that can be separated through reprocessing and used to make bombs.
- Over the past year, North Korea and Iran have been investigated by international agencies over their alleged misuse of civil nuclear power to make weapons-grade uranium.
- Recently, even Zimbabwe was reported to be planning a civil nuclear programme as a stepping-stone to weapons production.

Radioactive Discharges

The possibility of nuclear proliferation also increases both the problems of routine radioactive discharges to the atmosphere and seas and the likelihood of nuclear accidents. Radioactive contamination from Sellafield can be found throughout the Irish Sea and restrictions resulting from the radioactive fallout from Chernobyl in 1986 still affect 359 farms covering 53,000 hectares of land in North Wales.

Terrorism

Nuclear plants are vulnerable to terrorist attack.

- No nuclear reactor would be able to withstand a direct hit from a 747 crashing into it.
- Last year, Australian police stopped suspected terrorists who were believed to be staking out a research reactor near Sydney.
- George Bush announced that US troops had found plans of US nuclear power stations at al-Qaeda hide-outs in Afghanistan.

Unlike other generation sources, nuclear power produces a constant power and cannot reduce and increase output to match fluctuating demand. Nuclear power stations have, however, suffered from major shutdowns as a result of technical problems and routine maintenance. The Wylfa nuclear power station, for instance, has only operated at around 56% of its full capacity since it opened. During 2004, generation from nuclear sources fell by 10% because of outages for repairs and maintenance²⁷.

Over the last 50 years, nuclear power has had a fair chance to prove itself but has failed to deliver economic, safe or clean energy and has left a legacy of hazardous waste and financial costs for future generations. It seems that it is once again being promoted as a quick fix solution to an energy challenge but in reality amounts to no more than an expensive fig leaf to cover the embarrassment of failed attempts to make adequate reductions in carbon dioxide emissions.

(b) Liquefied Natural Gas

We believe that LNG is an essential part of the fuel mix for the UK for the medium term future. However, we consider it to be, like natural gas, only a “bridging fuel” that emits less carbon dioxide than coal or oil rather than the solution to climate change.

We have, however, opposed proposals to site two LNG terminals and storage facilities at Milford Haven on safety grounds. We do not believe that facilities dealing with such a hazardous fuel should be sited so close to a populated area. An LNG fire is more intense than petrol and can cause second-degree burns at a distance of two miles. Yet, the Petroplus LNG terminal is approximately only one mile from the towns of Milford Haven and Pembroke Dock and two large oil refineries, and it is directly adjacent to the village of Waterston (population 250). The Exxon terminal at South Hook is only one mile west of Milford Haven. The recent explosion and fire at the Buncefield oil storage depot in Hertfordshire has increased concerns about the safety of the thousands of local people who are living close to the LNG developments.

LNG Power Stations

While we recognise the role of LNG in the UK energy mix, we cannot support its use in CCGT (combined cycle gas turbine) power stations unless the waste heat is used locally. A 2GW LNG-fired CCGT power station has been proposed on the site of the former power station near Pembroke. A proposal for a 1.6GW power station at Waterston, Milford Haven has been withdrawn but we understand that an amended application might be re-submitted. We estimate that approximately 25% of the energy content of the gas extracted in the Middle East will be used in the processes of liquefaction, transport and re-gasification. The gas would then be burnt in a CCGT power station operating at 55–60% efficiency. Thus, over half of the energy content of the original gas would be lost. We believe that this level of inefficiency is unacceptable in this age of climate change and that the power stations should be suitably sized and sited to use their waste
heat in local industrial processes, such as the oil refineries. A scheme such as this has been developed at the Immingham gas-fired power station in Lincolnshire. This complies with the government’s policies of both reducing carbon dioxide emissions and developing combined heat and power systems (CHP).

The two CCGTs at Milford Haven would total 3.6GW capacity and would generate an annual average of around 3GW of electricity and 2GW of waste heat. At the Waterston power station, 250MW of the 900MW of waste heat would be used to re-gasify the LNG at the Petropius terminal but no such proposals exist at the South Hook LNG terminal. We estimate that the avoidable waste heat from the two power stations would be 1,050–1,250 MW. Nearby, are two oil refineries with a constant demand for process heat in the form of steam. We believe that LNG-fuelled power stations on the shores of the Milford Haven waterway should only be approved if they are to operate efficiently as CHP stations.

(c) Clean coal technology

The power station sector continues to be the single largest source of carbon dioxide emissions in the UK. We believe that, in general, a switch from coal to natural gas for electricity generation is desirable for the purpose of reducing these emissions. We recognise, however, that a switch back to coal burn is already happening, because of the current price differential between coal and natural gas and because of over-allocation in the Emissions Trading system, and that a considerable dependence on natural gas imports might be considered undesirable. A limited role for more efficient and less polluting (rather than “clean”) coal systems would, therefore, be acceptable.

In Wales, we would like to see the Aberthaw and Uskmouth power stations retrofitted with advanced super-critical boilers, feedwater heating and oxyfuel firing. According to the engineering company, Mitsui Babcock, replacing an old boiler with an advanced super-critical one could reduce carbon dioxide emissions by 23%\(^2\). The latest boilers also allow biomass to be added to the fuel mix. This, claims Mitsui Babcock, could reduce emissions by a further 20%. We support biomass co-firing at Aberthaw and Uskmouth with crops supplied from a local source. Mitsui Babcock estimates that the combined effect of retrofitting boilers and biomass co-firing can reduce emissions from coal down to similar levels as a gas-fired power station.

Coal gasification systems, such as Integrated Gasification Combined Cycle (IGCC), are being developed and could be used for poly-generation. This allows the gas (hydrogen) to be used either to power a gas turbine or to be piped elsewhere, such as industry or transport. A coal gasification power station has been proposed for the Swansea Valley but is currently on hold. These more efficient coal technologies have potential but are still either in the demonstration phase or have never been implemented on a large scale.

In view of the enormity of the threat of climate change, a limited amount of carbon sequestration and storage (CCS) may have a role to play, and we believe that any new coal or gas plant should be built as a “capture ready” plant in that they could easily implement CCS in the future. We cannot, at present, support the large-scale implementation of CCS due to the legal, regulatory, permanence and liability issues that still need to be resolved. We would, though, support research to identify suitable capture and storage sites in geological structures with proximity to Wales.

We support research and possible development of the capture and extraction of methane from coal seams. We oppose any opencast coal production but would support investigation of the possibility of a deep mine in the Margam area and any drift mine potential. We believe the Welsh Assembly Government should produce a coal TAN at the earliest possible opportunity.

(d) Wind power

Wind power is one of the cleanest forms of energy available. The fuel is free, abundant and inexhaustible, and no waste is produced when energy is being generated. It is technologically the most advanced of the renewable sources of energy and one of the most cost-effective. It has a great deal to offer in a world that needs all the clean energy it can get if it is to overcome the threat posed by climate change. It is not surprising to learn that it is the fastest growing source of electricity generation globally.

The UK has 40% of the total European wind resource but has not been the quickest to exploit it. Denmark and Germany have led the way. According to the British Wind Energy Association website, there are currently 117 wind energy projects in the UK amounting to 1,445 turbines generating 1,337MW of electricity and displacing 3,022,066 tonnes of carbon dioxide. In Wales, there are currently 23 wind farms (22 onshore and one offshore) generating 314MW of electricity.

As the lead renewable technology, it is not entirely surprising that wind farms have aroused controversy and a certain amount of opposition. Generating electricity on a significant scale from renewable sources is a considerable departure from centralised fossil fuel and nuclear generation with, often, a more local and visible impact. Other renewable energy proposals, such as wood burning, the growth of energy crops, hydro-power and the Severn Barrage, have also triggered a hostile response from some. An opinion survey in 2004, for instance, by the Tyndall Centre for Climate Change Research at Manchester University found that eight times more people were in favour of wind turbines than were in favour of a biomass plant in Devon\(^2\). This is remarkable considering Devon’s resistance to wind power having approved only one 3MW wind farm in the county.
The arguments raised against wind energy have been closely scrutinised by a number of authoritative bodies and generally dismissed.

In the 1993–94 session, the Welsh Affairs Committee study into wind energy strongly criticised evidence presented in opposition to wind energy, most notably by the Country Guardian organisation, the Campaign for the Protection of Rural Wales and the Countryside Council for Wales, referring to “inaccuracies”, “misinformation”, “misrepresentation” and “complete fiction”.

Almost 10 years later, in January 2003, the Welsh Assembly’s Economic Development Committee was so concerned about the misinformation presented to them about wind energy that they added a special annex [Annex A] to their report about renewable energy. This refuted the “myths and legends” that existed about subsidies to wind energy, shortages of electricity supply in California “caused by expensive wind energy”, intermittency, wind power replacing other power stations, the cost of wind energy and wind turbines supposedly destroying tourism and harming birds.

In May of this year, the Sustainable Development Commission produced a report, “Wind Power in the UK: A Guide to the Key Issues Surrounding Onshore Wind Power Development in the UK”. This also dismisses “myths”. A survey of 50 opinion polls in the UK concluded that people supported wind energy by, on average, a majority of four to one. The argument that wind energy requires “spinning reserve” in the form of conventional power to compensate for its intermittency is regarded as “seriously flawed”. It rejects the argument that onshore wind energy is excessively expensive, putting its cost at 3.2p/kWh compared to gas at 3.0p/kWh. This assessment does not take into account the financial benefits to health and the environment of using a non-polluting source nor the inevitable rise in the future cost of fossil fuels. On noise, it makes the valid point that rural activity, such as traffic and farm machinery, creates noise but that noise levels from a wind farm are on a par with background rural noise at night time.

Recently the DTI has placed on its website a “Wind Power—10 myths explained” section. We believe that this addresses a number of important issues and is worth including in full.

Wind power: 10 myths explained

Myth: Turbines are taking over the countryside

The facts:
— There are now some 1,120 turbines in 90 locations.1
— Generating 10% of UK electricity from renewables by 2010 could mean an increase by around another one and half times the current number.2
— Less than 1/20,000th of the UK (800–1,200 hectares) would be used for foundations and access roads.3
— Land between turbines can still be used for farming or natural habitat.

Myth: Wind farms are unpopular

The facts:
— Research suggests quite the reverse.
— 90% of the public believe the Government should encourage the use of renewable energy.4
— 80% support Government plans to significantly increase wind turbines.5
— 74% agree that wind farms are needed to meet current and future energy needs.6
— 66% would approve of a new wind farm in their area.7
— Approval is over 80% among those already within five kilometres of a wind farm.8

Myth: Turbines are a health hazard

The facts:
— Wind generation produces no emissions, harmful pollutants or waste products.
— In 25 years of wind generation, with 68,000 turbines now worldwide, there are no significant reports of health issues. This includes Denmark, whose turbine density is 30 times that of the UK.
— The DTI has commissioned an independent study in response to public concerns about low frequency noise.
— However, vibration levels 100 metres from turbines are a factor of 10 lower than the safety requirements for modern laboratories.9
— Each development requires a noise assessment which can be validated by the Environmental Health Officer.

Myth: Wind farms devastate house prices

The facts:
— A study by the Royal Institution of Chartered Surveyors suggests that wind farms have no lasting impact on UK house prices.
— This study is supported by evidence at wind farms in England, Scotland and Wales.
— It shows that local house prices recover from any initial impact once a wind farm has been operating for two years.
— Evidence suggests that those living nearest to wind farms are their strongest advocates.\(^{10}\)
— People promoting fears of falling prices risk making them self-fulfilling.

Myth: Wind farms keep tourists away
The facts:
— Many wind farms are tourist attractions.
— 30,000 people have visited the information centre for the new Scroby Sands offshore wind farm since May 2004.
— 90% of tourists surveyed in Scotland said wind farms made no difference to enjoyment of their holiday.\(^{11}\)
— Twice as many would return to an area because of a wind farm than would stay away.\(^{12}\)

Myth: Turbine blades threaten bird populations
The facts:
— UK wind farms have not been associated with any major adverse effects on birds.\(^{13}\)
— By far the biggest threat to UK bird populations is climate change,\(^{14}\) which is mitigated by renewables such as wind.
— Environmental assessments are required as part of the planning process, to ensure wind farms are properly sited and configured in relation to bird movements.
— These assessments have improved the understanding of bird ecology, helping conservation.\(^{15}\)

Myth: Wind produces little power
The facts:
— A single 1.8-megawatt turbine can produce enough power for 1,000 homes.\(^{16}\)
— Existing wind projects generate enough for nearly half a million homes.\(^{17}\)
— The average UK wind farm will pay back the energy used in its manufacture within three to five months—more quickly than coal and nuclear plants.\(^{18}\)
— Over its lifetime,\(^{19}\) a wind farm will repay this energy 50 times over.
— The geographical spread of wind farms minimises the loss of generation when the wind stops in any one location.
— Back-up generation is already in place to cover shut-downs of other forms of generation; little further back-up will be needed up to 2010 to cover periods when wind and other renewables generation is low.

Myth: Wind energy will not help climate change
The facts:
— Producing 10% of electricity from renewables in 2010 could cut carbon emissions by 2.5 million tonnes a year.\(^{21}\)
— Wind generation produces no carbon emissions.
— Every unit of energy generated by wind doesn’t need to be generated by carbon-producing sources.
— Any emissions savings lost through use of fossil fuel back-up will be minimal to 2010.\(^{22}\)
— Wind is part of a range of measures to tackle climate change, alongside other renewables and energy efficiency.

Myth: Projects are forced through with no regard for local concerns
The facts:
— Ministers have made it clear that wind farms should only be located in the appropriate place and that local concerns should be listened to.
— All wind farm proposals are subject to a strict planning process, addressing environmental, visual and community impacts.
— Local planning authorities consider onshore proposals up to 50 megawatts (the vast majority of applications to date).
— The planning framework\(^ {23}\) facilitates renewable energy, while maintaining safeguards for landscape and nature conservation.
— It does not impose targets or developments on local authorities.
— For applications over 50 megawatts, local authorities can trigger an independent public inquiry if they object.
— The public can participate in the planning processes and their views are taken into account at every stage.
— Projects not meeting planning requirements are refused consent.
— About a third of all applications are refused.²⁴

Myth: Onshore wind is being promoted at the expense of other renewables

The facts:
— The Government has committed £500 million to develop longer-term renewables, such as offshore wind, wave and tidal, solar, biomass and community projects.
— Onshore wind is currently the most economically viable renewables technology with scope for expansion, but it will increasingly operate as part of a renewables mix as other technologies come on line.
— The UK is already the world’s second-biggest offshore wind generator. Plans for further offshore wind farms represent the world’s biggest expansion of renewable energy.

2. BWEA, November 2004.
5. ICM Research, August 2004.
15. Dr Martin Perrow, University of East Anglia, on study of Little Terns at Scroby Sands wind farm, Norfolk.
16. BWEA.
17. BWEA.
19. Based on a turbine life of 20–25 years—BWEA.
24. Based on applications in the year to September 2004.

We are pleased that the Welsh Assembly Government recognises the benefits of wind energy and that we have to develop this lead renewable technology if we are to reduce carbon dioxide emissions. A few politicians, however, have jumped onto the “wind bashing” bandwagon, claiming that wind energy is unacceptable but other renewable energy sources, such as energy crops or tidal power, ought to be developed instead. While we agree that a wide range of renewable systems ought to be developed as soon as is realistically possible, this opportunistic approach conveniently ignores the fact that these other technologies might not yet be technologically, financially or environmentally feasible. Experience also shows that other renewable systems can trigger as much or more opposition from a minority as wind energy does.

We welcome the Welsh Assembly Government’s “benchmark” of generating 4 TWh per year of energy (mainly electricity but also some heat) from renewable resources by 2010. The 4TWh would amount to approximately 20% of Welsh electricity demand. We also broadly welcome the aim of securing most of this output by means of wind energy (800MW of onshore wind along with 200MW of offshore wind and other renewables) as this is the most economically attractive and technologically applicable renewable energy resource currently available.

Further contributions could be made by other offshore schemes, such as the proposed 750MW Gwint-y-Mor wind farm off the north Wales coast. In all, we calculate that present proposals for onshore and offshore wind farms could result in Wales obtaining as much as 27% of its electricity demand from wind energy by 2012. This would be quicker than it would take to build a new nuclear power station.
The calculations are as follows:

Wales electricity demand = 20 TWhrs/yr

Onshore wind capacity = 200 MW (already built) plus 800 MW additional target by 2010. At 30% load factor this = 300 MW average annual output

Offshore wind capacity = North Hoyle 60 MW plus Scarweather 100 MW plus Gwynt y Mor 750 MW = 900 MW in total

35% load factor = 315 MW average annual output

In all, 615 MW from both onshore and offshore wind farms.

In one year, 615 MW average would generate 0.615 x 8.76 = 5.39 TWhrs/yr or 27% of current demand in Wales. This would supply 810,000 people in Wales.

(e) Bio-mass Energy

Biomass is a term that describes fuels based on organic matter. In Wales, the main sources are forestry/woodland residues (around 70% of felled forestry is left on the forest floor), energy crops (e.g., short rotation coppice of willow or poplar, herbaceous grasses such as miscanthus) and wood manufacturing residue.

An early indication of the difficulties that bio-mass schemes could face emerged when proposals for using timber to generate electricity at Newbridge-Upon-Wye and at Llanddewi Velfrey in Pembrokeshire, were defeated at the planning application stage having aroused considerable public opposition.

The Welsh Assembly Government has since produced a Farm Woodland Development & Biomass Action Plan. This has identified a range of actions, including research, demonstration projects, economic and market analysis, awareness raising, training, grant assistance and the examination of the current agricultural subsidy system. Despite this, progress has been slow and concern has been raised about the subsidy system in Wales compared to England. Whereas English farmers can obtain grants to grow energy crops, it would appear that in Wales grants are only available under the wood energy business scheme for help in developing markets and setting up wood burning fuel plants. Although, Aberthaw power station has now made a commitment to burn 200,000 tonnes of biomass crops annually, Welsh farmers now fear that these fuels will be transported in from England where farmers can receive grants of up to £1,000 a hectare to grow the energy crops. This is clearly an unsatisfactory situation that the Welsh Assembly Government needs to address. We believe that energy crops should be sourced locally so as to cut out the negative environmental and economic impacts of increased transport.

One example of what can be achieved in switching to a bio-fuel has occurred in Pembrokeshire. In 2000, the Pembrokeshire Energy Agency installed a wood pellet heater at its office based at the West Wales Eco Centre in Newport. A partnership, involving the Agency, the Eco Centre, the County Council, the National Park Authority, a consultant and a local school, was established to promote the fuel. As a result, both the Ysgol Preseli comprehensive school and leisure centre at Crymych and the newly refurbished offices of the Pembrokeshire Coast National Park Authority at Pembroke Dock are now heated by wood pellets rather than oil. We believe that schemes such as this could be more vigorously promoted by the Welsh Assembly Government.

(f) Geothermal Energy

Wales has no “hot rocks” which could be used to generate electricity as seen in, for example, New Zealand and Iceland. However, there are many areas of Wales off the gas grid where ground-sourced heat pumps could provide low emission space heating for dwellings and commercial buildings.

(g) Tidal and wave energy

We support these forms of energy generation in principle and individual schemes provided they are environmentally acceptable and cost effective.

Tidal lagoons

We believe that tidal lagoons located in areas of high tidal range around the UK, notably the Severn Estuary, Liverpool Bay and the Thames Estuary, could generate significant quantities of cost-competitive electricity with a low environmental impact. The company that has devised the technology, Tidal Electric, are proposing a 48 MW (installed capacity) scheme, with an average output of 23 MW, which is equivalent to the average electricity consumption of 30,000 people, in Swansea Bay. It would impound just over two square miles of sea near Port Talbot. Further, and larger, schemes could be built in the Severn Estuary that could generate as much as 24 TWhrs/year, which is equivalent to almost 7% of the total annual electricity demand for England and Wales. The lagoons could generate electricity on both the ebb and flow tides and thus provide constant and controllable base load power that could be managed to act as a back up for variable sources of generation. They would also provide power close to the major demand centres in south
Wales and the west of England. The Swansea Bay proposal has been assessed by independent engineering consultants, WS Atkins, who regard it as viable and, at 3.4p/kWh per unit generated, cost effective. We have some concerns about the sourcing of primary aggregates for the construction of the lagoons as the tonnage could be significant and could have a large quarrying and transportation impact. We understand, however, that the use of geo-textile bags filled with dredged silt or scrapings from the seabed within the impounded area could significantly reduce primary aggregate demand. The lagoons, once built, could have a direct ecological benefit by creating new habitats for fish, birds and marine life. We have been disappointed by the apparent lack of recognition by the DTI and the Welsh Assembly Government of the tidal lagoon concept. We are pleased to learn, though, that the DTI has now given permission to Tidal Electric to seek planning consents. For further information see: http://www.foe.co.uk/resource/briefings/severn_barrage_lagoons.pdf

Severn Barrage

We are disappointed that the Welsh Assembly Government appears to be favouring the Severn Barrage, which has been strongly opposed on environmental grounds, ahead of tidal lagoons. There are a range of possible negative and positive environmental and economic impacts associated with locating lagoons or the barrage in the Severn Estuary. However, initial comparisons strongly indicate that lagoons could be significantly less environmentally damaging and more cost-effective and powerful than the barrage. Lagoons would not directly impound the ecologically valuable inter-tidal areas of the Estuary, some of which have been designated as a Special Area of Conservation and a RAMSAR site, as the barrage would. Indeed, they may enhance wildlife habitats. Lagoons would also generate twice as much power per square mile impounded than the barrage.

Tidal Hydraulic Turbines

This system was initiated in Pembrokeshire in 1997 and trials have taken place in the Milford Haven waterway. The project received early funding from the Assembly’s Environmental Development Fund, administered by the Pembrokeshire Coast National Park Authority, but does not appear to have had Assembly support since. We hope that this innovative locally developed renewable energy scheme receives adequate support from the DTI and the Welsh Assembly Government.

Wave Dragon

A wave energy device—the Wave Dragon—should be tested off the Pembrokeshire coast in the near future. If successful, the present 7 MW unit will be extended to a 70 MW unit in 2008–09. The Assembly’s Economic Development Minister has welcomed the development. We hope they receive adequate support and note that they could be constructed locally.

(h) Hydro Electric Energy

Hydropower has a long tradition in Wales playing an important role in the industrial revolution. According to the Assembly commissioned “Strategic Study of Renewable Energy Resources in Wales” (2001), the total installed capacity of hydropower schemes is 160MW. These vary from medium sized grid connected schemes to domestic schemes. Only around four new domestic schemes are added each year. We do not believe there is potential for any significant expansion in hydropower in Wales and any that are proposed could face opposition from the angling community.

(i) Energy from Waste

We oppose the incineration of waste for energy generation. Incinerators release toxic air pollutants, produce toxic ash that has to be buried in hazardous waste sites and encourage the production of waste as a source of fuel. Burning rubbish means that councils are less likely to develop recycling and waste minimisation schemes.

(j) Micro Energy Systems

Micro energy systems are defined as any technology that is connected to the distribution network (if electric) and with a capacity below 50–100kW. Most domestic installations are below 3kWe, though thermal systems could be larger. The technologies include solar photovoltaics, wind turbines, small hydro, active solar water heating, ground source heat pumps, bio-energy, small CHP (renewable and non-renewable) and hydrogen energy and fuel cells.

Currently, there are thought to be approximately 100,000 micro energy units in the UK, mostly solar heating, but installations are increasing, particularly in small wind and ground sourced heat pumps. Micro CHP is just beginning to enter the market.
A recent study by the Energy Saving Trust\(^\text{30}\), in conjunction with Cambridge University Faculty of Economics, EConnect and Element Energy, has demonstrated a considerable potential in microgeneration for reducing carbon dioxide emissions. The report concludes that, by 2050, microgeneration could provide 30–40% of the UK’s total electricity needs and reduce carbon dioxide emissions by 15% a year.

This potential is acknowledged by the Energy Act 2004 which authorises the Secretary of State to “prepare a strategy for the promotion of microgeneration in Great Britain”. We understand that the Welsh Assembly Government is due to produce a microgeneration strategy in April next year. We urge the Assembly Government to make the most of this opportunity to reduce carbon dioxide emissions and to take a global lead in clean energy.

The planning system in Wales could be given far greater support and guidance on approving and promoting the development of micro-generation technologies which would encourage the development of self-sufficient energy developments, particularly in new homes or business developments. The technology is widely available, and setting targets for microgeneration could drive a whole new innovative technology sector in Wales, creating more jobs and locally based economies around the production, installation and servicing.

4. ENERGY EFFICIENCY

Further to comments made earlier in this paper, we wish to emphasise the importance of energy saving and conservation measures. The Energy White Paper (2003) states, “the cheapest, cleanest and safest way of addressing our energy policy objectives is to use less energy”. And, according to an article in the Scientific American, delivering a kilowatt-hour from a nuclear plant costs at least three times as saving one through energy efficiency\(^\text{31}\).

Energy conservation measures are one of the best examples of sustainable development in action, bringing about improvements to the environment by reducing fuel use and the associated pollutants; to the economy by reducing fuel bills and creating employment; and to society by reducing fuel poverty and improving health. Although energy conservation has improved over recent years, the UK’s Energy Sector Indicators reveals that the average house in the UK only has an energy efficiency rating (SAP) of 31.3 out of a maximum of 120. Current carbon dioxide emissions from the existing 25 million dwellings in the UK are estimated to contribute around 30% to UK emissions\(^\text{32}\).

We believe that the Welsh Assembly Government’s Energy Efficiency Action Plan is a totally inadequate response and ought to be redrafted. A new Energy Efficiency Action Plan should include targets, timetables for delivery and mechanisms for measuring progress. This has to be backed by extra funding, such as an increase in the budget for the Home Energy Efficiency Scheme (HEES) and for local delivery services, such as energy advice centres and energy agencies.

The Welsh Assembly Government could also implement recommendations made by the International Energy Agency in two recent reports: “Saving Energy in a Hurry” and “Saving Electricity in a Hurry”\(^\text{33}\). These are based on experiences in California, Brazil, Norway, New Zealand and Japan where temporary shortfalls in energy supply and/or price hikes have been successfully dealt with through energy efficiency measures. An example of this is California replacing almost a million lamps in traffic light with high-efficiency Light Emitting Diodes (LEDs) saving over 60MW—enough electricity for 60,000 homes.

At present, cabinet responsibility for energy issues at the Welsh Assembly Government lie mainly with the Minister for Economic Development, with the Minister for Environment, Planning and Countryside with responsibility for bio-fuels, and the Minister for Social Justice and Regeneration having responsibility for HEES and fuel poverty. Establishing and delivering on energy policy would be better achieved, we believe, if all energy issues became the responsibility of one cabinet minister. It would be preferable if this minister also had a clear responsibility for leading on climate change issues.

5. PLANNING

Friends of the Earth Cymru recognises the important role of the planning system in helping to move from a highly centralised, fossil fuel and nuclear power based energy system towards a more distributed and sustainable renewable energy system. We have broadly welcomed the Assembly Government’s “TAN 8: Planning For Renewable Energy” [see Appendix 2 for the Friends of the Earth Cymru response] for its role in providing clearer guidance to local authorities, local communities, environmental organisations, government agencies and developers, and for accepting the essential role of planning in delivering the Assembly Government’s target of producing 4TWh of electricity per annum from renewable energy sources, mainly wind energy, by 2010. We are concerned, though, that the process is too restrictive and would have preferred a “criteria-plus” approach in which the sieve-mapping process was integrated with a criteria-planning approach. We also regret that the proposed 400MW Camddwr wind farm is not included in a Strategic Search Area because it is used by the MOD for occasional tactical low flying.
6. CONCLUDING RECOMMENDATIONS

1. The main driver for energy policy in Wales should be the recognition of the crisis of climate change and the need to reduce carbon dioxide levels.

2. That the power of executive competence relating to the promotion of renewable energy, the promotion of energy efficiency, building regulations, power station consents (over 50 MW) and gas pipeline consents should be devolved to the Welsh Assembly Government.

3. No new nuclear power stations should be built because the risks far outweigh the benefits and because a range of safer, greener and cleaner alternatives can deliver both greenhouse gas reductions and energy security.

4. LNG power stations should only be approved if they operate as combined heat and power units and are safely sited at a sufficient distance from existing communities.

5. A limited role for less polluting (rather than “clean”) coal power stations is acceptable.

6. The Welsh Assembly Government should continue to support wind energy, both onshore and offshore, as it can make a substantial contribution to clean and cost effective electricity generation in Wales.

7. Tidal lagoons could make a substantial contribution to the generation of clean and cost effective electricity generation in Wales and should be given more serious consideration by the Welsh Assembly Government.

8. A range of other renewable energy sources, such as bio-fuels and wave power, and micro energy systems should be supported in order to reduce carbon dioxide emissions.

9. The Welsh assembly Government’s Energy Efficiency Action Plan should be redrafted to include targets, timetables for delivery and mechanisms for measuring progress.

10. Responsibility for all energy matters should rest with one minister who should also have responsibility for climate change issues.

REFERENCES

1. Figures for primary fuel inputs for inland energy consumption were taken from the UK Digest of UK Energy Statistics, published 25/08/05. (See www.dti.gov.uk/energy/inform/dukes/) Friends of the Earth converted volumes of primary energy consumed in millions of tonnes of oil equivalent (Mtoe) to millions tonnes of carbon emissions (MtC).


4. As above in 3.

5. As above in 3.

6. As above in 3.


8. As above in 7.

9. DTI’s Digest of UK Energy Statistics 2005 states that electricity makes a 17% contribution to the UK’s total energy demand and that nuclear power in 2004 made a 19% contribution to total electricity generation.

10. As above in 7.


12. DTI, 2005, Secretary of State’s first report to Parliament on security of gas and electricity supplies in Great Britain.


15. The calculations are as follows:

- Wales electricity demand = 20 TWhrs/yr
- Onshore wind capacity = 200MW (already built) plus 800MW additional target by 2010. At 30% load factor this = 300MW average annual output
- Offshore wind capacity = North Hoyle 60MW plus Scarweather 100MW plus Gwynt y Mor 750MW = 900MW in total
- 35% load factor = 315MW average annual output
In all, 615MW from both onshore and offshore wind farms
In one year, 615MW average would generate 0.615 x 8.76 = 5.39 TWhrs/yr or 27% of current demand in Wales. This would supply 810,000 people in Wales.

19. As above in 18.
20. As above in 18.
21. As above in 18.
22. Research by Friends of the Earth Cymru’s energy campaigner, Neil Crumpton.
23. As above in 18.
24. Information provided by energy consultant.
25. As above in 18.
27. Digest of UK Energy Statistics 2004—DTI.
29. www.supergen-bioenergy.net/?sid = 252&pgid = 284
30. Potential for Microgeneration: Study and Analysis (November 2005) By EST.

December 2005

Written Evidence from Peter Ogden, Director, Campaign for the Protection of Rural Wales

Summary

i. The Campaign for the Protection of Rural Wales (CPRW) is Wales’ foremost voluntary countryside organisation. It was founded in 1928 to protect and enhance the quality and diversity of the landscapes and environment of Wales for the benefit of future generations. In furthering these aims, CPRW recognises the importance of sustaining the vitality of local communities and their cultures within living and evolving surroundings. Accordingly the organisation by implication has been promoting the ethos of sustainable development for many years.

ii. CPRW contends that the environment is one of Wales’ most valuable natural, social and economic assets. These assets are often non renewable and hence their integrity must be managed in a responsible and sensitive manner if future generations are to have at least the same, if not a greater degree of benefit from them as is enjoyed by current generations.

iii. We are concerned that in respect of the current Assembly’s agenda for the development of energy in Wales this will not be the case. Our concerns and the basis for our representation to this Inquiry can be summarised as follows;
   — The approach being promoted fails to balance future energy needs and the means to achieve them, in an integrated manner.
   — The approach suggested by the Assembly in their Energy Route Map is incomplete, flawed in terms of the focus of its priorities and fails to recognise and account for the significant harm that certain aspects of its approach will inflict on the countryside of Wales.
   — The balance of energy generation being suggested does not take proper account of the importance of energy demand management and fails the fundamental premises which underpin the concept of a sustainable and environmentally responsible energy portfolio.
   — Elements of the energy generation programme have been ignored and misguided priorities given to other aspects of it.
   — The agenda for the development of renewable energy has been deliberately distorted in favour of one technology which promotes solutions which are visually and socially derisive.
The Assembly refuses to accept that their proposed short term targets (2010) for the development of renewable energy can be achieved without priority and over dependency being given to one form of technology, namely the development of onshore wind power generation.

iv. In conclusion CPRW believes that the present approach being promoted by the Assembly should be revised in a manner which is integrated and more environmentally relevant.

1. INTRODUCTION

1.1 CPRW is a registered environmental Charity with approximately 3,250 members. Our 17 Local Branches spread throughout Wales, encourage local action to help safeguard and enhance the integrity of rural landscape and their communities. This submission is submitted on the organisation’s behalf by its Director, Peter Ogden BSc. MRTPI, a member of the World Commission on Protected Landscapes.

1.2 CPRW values the distinctiveness and quality of rural life and the need to maintain the status of local communities and their traditions in a vibrant and modern day context. We produce advice and guidance upon matters which affect life in these areas and increase the public’s awareness of the importance and value of their local landscapes and the need to protect, conserve and enhance them, so as to maintain the diversity of Wales’ heritage.

1.3 In our role as watchdogs and stewards of the landscape of Wales, CPRW aims to encourage others and persuade decision makers to:

— Conserve and enhance the landscape and quality of life in the communities of rural Wales, by influencing change in these areas for the better.
— Promote the unique culture and distinctiveness of life in rural Wales.
— Inform, advise and influence the public and decision makers as to the importance of the landscapes of Wales, and their role as dynamic assets.
— Celebrate the qualities of rural Wales.

1.4 Our ethos is embraced in the simplicity of our corporate message
Look and learn
Care and keep
Influence and improve

1.5 The quality and diversity of the landscapes of Wales have long been recognised as assets of environmental significance. Only more recently however, have their substantial economic and social benefits been acknowledged. The natural resources of Wales are influential economic assets providing an important context for business as well as for community life and personal development. Despite the importance and value of Wales’ landscapes, their relevance and the contribution they make to the quality of modern day life and the opportunities they offer for a more sustainable ways of living, are still not fully appreciated and more worryingly often misrepresented.

1.6 CPRW advocates that contact with the natural and cultural heritage of rural Wales contributes to a community’s distinctiveness, its sense of place and thereby engenders civic pride in a community for its surroundings. The social and personal benefits associated with strong relationships of this sort enhance the quality of life for those living and using rural Wales. Developments or activities which fracture this relationship create resentment and tensions. Hence when the character of a landscape is significantly changed, the environmental and social relationships which previously existed are altered and in some instances lost. It is for exactly this reason that the planning system protects the countryside from inappropriate forms of development. The current differences of opinion in Wales associated with the delivery of the Assembly’s future energy agenda, has brought these tensions into sharp focus. The continuing hostility to the use of the uplands of Wales for industrial scale wind farms and the environmental opposition which has arisen with respect to the recent TRANSCO Liquefied Natural Gas pipeline proposal, support our view.

1.7 Given these circumstances, CPRW welcomes the initiative taken by the Welsh Affairs Select Committee in investigating the wisdom and validity of the proposed directions being suggested for Wales’ future energy agenda. CPRW believes that an independent and impartial review of Wales’ strategic future energy needs and the mechanism to best deliver them is crucial and long overdue.

1.8 As an organisation committed to protecting the quality, diversity and long term integrity of all Wales’ landscapes, we believe that any agenda for the development and use of energy in Wales, must be integrated and also have full regard to the needs of protecting our environment. We have long advocated that responsible environmental stewardship is the most appropriate and effective means of achieving this. Without it, no development agenda including that associated with energy can be considered sustainable.

1.9 We note and remind this Committee that the Assembly in its recent Environment Strategy has publicly supported the European Landscape Convention. By so doing, it acknowledges that sound landscape planning and management must be embedded in the principles which guide all future strategic policy.
Given these circumstances, we therefore advocate that any meaningful future energy strategy for Wales, should provide not only a clear picture of how our energy needs can be best provided, but simultaneously demonstrate how Wales’ environment assets are being protected and enhanced.

Having carefully considered the contents and implications of the current policy documents produced by the Assembly, ie its Energy Route Map and the relevant parts of Planning Policy Wales and its associated TAN 8 Renewable Energy guidance, CPRW wishes to present for this Inquiry’s consideration, the weaknesses and policy deficiencies that are apparent in the Assembly’s logic in meeting Wales’ future energy needs.

Our particular concerns are those aspects of the Assembly’s approach which impinge on the landscapes and rural communities of Wales.

CPRW and the Sustainable Use of Energy in Wales

CPRW recognises the responsibility that the Westminster Government and the Assembly Government have in addressing the challenges posed by climate change and global warming. It accepts that measures must be taken to reduce the impact man is having on the environment and that these responses should be prioritised so as to achieve the greatest possible reductions as soon as is possible. Reducing the demand and use of energy, maximising the benefits of any energy produced and minimising losses associated with inappropriate transmission or wastage should have in our view, priority over the quest to generate increasing amounts of power to meet what seems to be the inevitability of society’s insatiable demands.

CPRW likewise recognises that decisions about the energy agenda for the whole country, both onshore and offshore must be taken in an integrated and consistent manner.

CPRW would contend however that this is not the case in Wales and registers its concern that the Assembly Government is making important decisions about the future direction of energy policy independently and in isolation from others and more importantly without recognising the legitimacy of public opinion. We note that this is being undertaken despite the fact that the powers for energy policy in Wales, have not been devolved to it from Westminster.

We also note that there is a perverse rather than complementary subdivision of responsibility in the Assembly Government in the way in which it promotes and sanctions energy initiatives. No Energy Division as such exists in the Assembly Government and hence the Minister for Economic Development and Transport has the portfolio for the development and delivery of Wales’ energy generation whilst the Minister for the Countryside, Environment and Planning is charged with the regulatory function of ensuring that this agenda is undertaken in a manner which reflects best practice from a land use and planning perspective. It is very clear from recent events that the former is dictating to the latter and not as should be the case, the other way round with direction for implementation flowing from a robust energy planning and policy base.

In addition, we also note that under the provisions of the Electricity Act 1968, power generation schemes with an output more than 50 MW are determined by the Department of Trade and Industry and not through the relevant planning procedures as happens with most other forms of “development” in Wales. We believe that this arrangement does not encourage nor does it provide a clear and integrated process for the strategic planning for Wales’ future energy needs or the delivery of them. We note the consequences this has locally, where communities are often disengaged from the decision making process and unable to express their fears and concerns about unacceptable developments which will directly affect their lives. The massive public opposition to the Cefn Croes wind farm is testament to this. Similar circumstances now exist with the LNG pipeline proposed for routing across South Wales.

Notwithstanding these difficulties, CPRW supports the development of a balanced agenda for energy creation and for its responsible use. The organisation recognises that the introduction of the widest range of measures including the generation of appropriate forms of renewable energy in conjunction with effective energy conservation measures must play a crucial role in fulfilling the future energy needs of Wales and meeting the underlying challenges associated with reducing CO2 emissions.

CPRW is not prepared however to accept an energy policy which in striving to fulfill these requirements, fails to fully account for the inherent value of the landscape of Wales and the significant benefits it provides to the economy and quality of life in rural areas.

Likewise CPRW does not accept the basic premise that focussing solely on the generation of greater amounts of power, provides a sensible, balanced or long term solution to Wales’ energy needs. We believe a more holistic approach which embraces the full potential and realistic role of initiatives which encourage energy demand management and energy conservation, alongside those which provide security for our future energy needs, must be the founding principles for an acceptable strategy.

We remain unconvinced that this is the Assembly’s primary motive and are concerned that its priorities appear to be aimed at maximising the power generating output of Wales regardless of the environmental and social consequences. We believe that little serious regard is being given to the principles
advanced in the Assembly’s own Environment Strategy, namely that those environment assets of long term benefit to Wales, namely its landscapes, should be protected and not traded for short term political expediency.

2.10 CPRW also has grave concerns that the emphasis in the Assembly’s Energy Route Map is not a true reflection of reality. We believe that the potential for rolling out certain renewable energy technologies in particular the opportunities provided by marine and offshore technologies, are being deliberately suppressed. For these reasons CPRW does not accept that the logic, the mechanisms set out in the Wales Energy Route Map nor the conceptual origin of the policies in the MIPPS on Renewable Energy and its supporting TAN 8, are appropriate, justified or defensible.

2.11 Similarly CPRW does not accept either the legitimacy or the basic premises in the Energy Route Map and TAN 8, which seek to justify the overriding priority being given to the development of onshore wind power generation and the consequential planning and market advantage this is creating. In view of the current dominance being given to this single technology, CPRW believes that the Renewable Energy element of the Assembly’s proposals for power generation in Wales is incomplete, misguided and hence flawed.

2.12 Given these circumstances, CPRW is of the opinion that the Assembly’s current energy agenda is aspirational and disjointed. It lacks any kind of inventory of current energy generation, fails to assess future need and the consequences of this and contains insufficient action to deliver its aims. We also believe the proposals outline a vision that is unconvincing and unacceptable to a significant proportion of the Welsh public.

2.13 We support the view that there is a need for a radical review of the Assembly’s current approach. This reappraisal in our view should include a more realistic energy programme which provides clear targets for each of the energy sectors and technologies, timetables for their implementation and objective methods to monitor their delivery. In addition we also believe that the Strategy should include proper incentives and the necessary support mechanisms to deliver energy efficiency measures to all energy users.

3. The Potential for Renewable Energy to Meet the Proposed 2010 4TWh Target

3.1 Because of our landscape interests, CPRW is particularly concerned that the Assembly is using the development of renewable energy as a misleading surrogate for solving the problems associated with the reduction of CO2 emissions and hence the real challenges of combating climate change. We contend that the reduction of CO2 emissions which will arise from a policy reliance based on the dominance of onshore wind generation as a priority renewable power source will be minuscule. Whilst this political pretence, that the promotion of onshore wind schemes can make a difference in combating climate change continues, the upland landscapes of Wales are being unfairly and unjustifiably traded and converted into industrial turbinescapes. We trust that this Committee will recognise our point of view on this matter and unequivocally reject this contention once and for all.

3.2 Likewise we hope that the Committee will dismiss the assertion that onshore wind development is the only feasible short term option to meet Wales’ proposed 2010 renewable Energy target. CPRW has also continually advocated that this renewable energy target is both artificial and completely misleading. We believe that by linking this artificial time line to a 4TWh renewable energy target, the Assembly has deliberately contrived an agenda for the development of major on shore wind power stations. We contend this is unacceptable and that the target can be equally delivered using other renewable technologies which do not impair the landscape of Wales.

3.3 In support of our view that other renewable technologies can achieve the Assembly’s mid term renewable energy target, CPRW undertook an analysis (as part of our submissions to the Assembly’s TAN 8 consultations in November 2004) of the potential power generation contributions that each of the alternative renewable energy technologies could offer from 2005 to 2010.

3.4 Our analysis considered those renewable energy technologies where information about performance was currently available. We concluded that over the next five years, with the necessary political will and appropriate levels of financial support, most of the fast maturing technologies could increase their current generating potential thereby contributing even more to the power generating equation than the Assembly’s estimates require. Given that our figures do not account for the power savings which greater investment in energy conservation measures and demand management clearly offer, then we believe our overall position is even more tenable.

3.5 The potential contribution each technology could offer is considered as follows.

Wind power

3.6 CPRW analysed the range of both existing and consented wind power developments (as at November 2004), along with those which are subject to contemporary planning applications and preliminary scoping exercises. (CPRW is currently updating this information and will make it available to the Committee should it be required.)
3.7 The results of this work, set out in Appendix 1 Table 1, show that even in November 2004, a cumulative total of 300 MW of onshore wind power capable of producing 0.79 TWh per annum was either currently operational or had been consented. In addition, a further 0.78 TWh per annum from 211 MW of power could be realistically anticipated to become available, should all the proposals that were at that time seeking planning consent, materialise.

3.8 CPRW also notes that the potential of industrial sites and brownfield zones was not considered at all by the Assembly in the background analysis which informed the decisions which underpin its MIPPS statement or its TAN 8 conclusions. That being the case despite their potential, the contribution these areas could make was not been factored into the supply equation or the strategic analysis used to justify the need for and location of the Strategic Search Areas now embedded in TAN 8.

3.9 The ENDS report1 2004, specifically considered the role of brownfield sites as locations for renewable energy schemes and identified the potential for 144 MW of installed wind capacity if 26 existing major industrial / brownfield sites were developed. Clearly this extra contribution significantly boosts the potential supply of renewable energy which would be available by 2010. CPRW also notes that the use of these types of sites is more logical as they are often more cost effective to redevelop than remote undeveloped upland sites. Their established service and power transmission infrastructure, the fact that they have good transport and communications access and their connectivity with the National Grid for power transmission, highlights their obvious suitability. Despite the opportunities these sites provide, their potential has been totally overlooked and again demonstrates the deficiencies of the MIPPS exercise.

3.10 In the marine environment, we note that 0.9 TWh per annum of offshore wind power is currently available from existing and consented schemes, (including Scarweather Sands) whilst the Gwyn y Mor scheme, projected for completion by 2009, and now a proposal in the public domain, would add another 2.63 TWh per annum2 to this total.

3.11 It is therefore clear that collectively onshore and offshore wind power generation already accounts for 1.69 TWh and could realistically rise to a minimum of 4.32 TWh before 2010 when the Gwyn y Mor scheme becomes operational. If all the wind power stations which are currently being determined by Planning Authorities were consented, this figure would rise still further to 5.1 TWh per annum. Although CPRW is obviously unable to speculate as to how many new offshore proposals may be brought forward in the next five years, the addition of one further scheme of a similar size to the Scarweather Sands, could add as much as 30% of all the existing installed onshore wind energy output. This would increase the total power output figures more effectively than would be the case if reliance was being placed on the equivalent number of individual clusters of onshore wind power schemes. We also contend that the environmental impacts of developing sites in the offshore environment is likely to be less environmentally severe given the strategic work which has been undertaken to identify those parts of the marine environment which have the greatest environmental capacity to accept wind farms.

3.12 CPRW also notes the potential offered by other forms of marine power generation as a source of renewable energy, in particular the opportunities offered by carefully designed tidal lagoons. This technology alone is reliably forecast to contribute 0.33 TWh per annum of power by 20103.

3.13 The conclusions of our evidence clearly demonstrates that 2.2 TWh of renewable power is already available from installed schemes and is likely to rise to 5.6 TWh when all the current schemes in the planning system materialise. If the other sources of renewable power are added to this figure, the supply rises to 6.7 TWh. Given that the estimates for offshore wind output are conservative, since larger and more powerful turbines are likely to be used in years to come, it is clear to see that the target of 4 TWh can be easily achieved without the need for major onshore wind power stations as suggested by TAN 8.

3.14 Even if the assumptions regarding the contribution from onshore power stations currently awaiting planning consent are excluded or do not materialise to their full extent, the outputs provided by wind generated at industrial and brownfield areas, offshore wind and marine technology and the contribution which will be made from biomass and power from waste recovery systems, will still enable the 2010 target to be easily achieved. Given these circumstances it is apparent that the obvious and important relationship between onshore and offshore wind development has been ignored by the Assembly in its development of strategic renewable energy propositions.

3.15 Our conclusions that the diversification of renewable energy supply can be achieved without prejudicing the long term aim of increasing renewable energy production are also consistent with the views of the Department of Trade and Industry. The benefits of diversifying energy supply rather than focussing on one technology were recognised by them as long ago as 1998. Their Energy Report4 refers specifically to the fact that

“... What is required is a policy on fuel mix which can henceforth inform and guide the proper exercise of Ministerial powers” (Para 7)

---

3.16 The same report further concludes that
"
... Offshore wind, biomass and solar power may all become significant sources of UK electricity during the next century, perhaps eclipsing those renewables most heavily deployed today. The NFFO mechanism should allow Government assistance today for those currently more expensive technologies to reach the market place” (Para 25)
"

3.17 CPRW contends that this philosophy is as relevant today as it was in 1998 and that although the funding mechanism has changed, the Assembly should have recognised the wisdom of bringing forward those technologies which are both effective and least environmentally damaging. As the 1998 report notes "... The overwhelming impression with which we are left is that there is a crying need for the integration of environmental priorities with energy policy, rather than one being a tardy intrusion into the other” (Para 13)

4. Conclusions

4.1 Based on the evidence CPRW has presented it believes that elements of the present energy agenda proposed for Wales are strategic disjointed, spatial inappropriate, technologically incomplete, and environmentally dismissive. We therefore submit that the current approach being promoted by the Assembly is sustainably indefensible and contrary to the public commitment it has given to promote sustainable development.

4.2 Given these significant and fundamental deficiencies, we contend that a reappraisal of both the Assembly’s existing strategic direction for future energy provision and its tactical priorities are required as a matter of urgency.

4.3 CPRW therefore recommends that the following must be properly accounted for in any future strategy for energy development and energy use in Wales. An energy strategy which ignores these matters is illogical and unrealistic.

— The use of Environmental Proofing to ensure that the role and benefits which the landscapes of Wales provide are fully accounted for in any future strategic energy policy.
— A realistic assessment of how the energy consequences of increased traffic growth can be tackled, given its accepted role as a major contributor to global energy use and CO₂ emissions in Wales and beyond.
— How short term mechanisms to promote and trigger realistic energy conservation at the domestic level can be achieved quickly.
— The manner by which energy wastage can be reduced by reducing energy transmission links between the source of generation and its point of consumption.
— The realistic energy contribution that all forms of renewable energy sources offer and in particular the potential of energy generation from waste recovery.
— The role that nuclear power will have in Wales’ generation priorities and the consequential implications of developing or resisting this form of technology on Wales’ future energy balance.

4.4 We are particularly disappointed that the Assembly has failed to take these matters into account and more importantly not provided the necessary evidence based information to justify its current and preferred approach.

4.5 We trust that the conclusions from this Inquiry’s investigation will highlight and confirm these and other deficiencies and expose the inadequacies of the Welsh Assembly Government’s intended future energy agenda.

APPENDIX 1

RENEWABLE ENERGY POTENTIAL TO MEET THE PROPOSED 2010 4TWh TARGET

Table 1: Existing and Potential Wind power projects (November 2004)

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<th>Operational TWh</th>
<th>Actively Scheduled Winds</th>
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31 November 2005

Written Evidence from Ramblers’ Association Wales

1. INTRODUCTION

1.1 The Ramblers Association Wales (RA Wales) is a registered charity with 7,000 members, associated with over 40 local RA groups throughout Wales. Our aims are not only the promotion of walking, but also the protection of the countryside and the quality of its landscape for quiet enjoyment by walkers and the wider public. Walking-related tourism in Wales generates £548 million pa (WTBBestFootForward). The Ramblers’ Association in the UK as a whole has a membership of 140,000 (UK wide) and constitutes the largest organisation representing walkers.

1.2 RA Wales has an established policy towards renewable energy and is supportive of actions to reduce carbon emissions associated with climate change. As indicated in the UK 2003 Energy White Paper, the RA believe that energy generation should be realised from a suite of technologies rather than over-emphasis on any one alternative—and should be delivered through a strategic planned approach and in consultation with stakeholder groups.

2. SUMMARY

The views of RA Wales can be summarised as follows:

2.1 The Welsh Affairs Committee has identified a range of energy generation technologies in their review. We believe that the full range of such technologies should indeed be considered, including Solar Energy, which has been omitted from the portfolio. We also consider that energy needs should be addressed through specific policies on energy conservation and the management of demand, rather than simply adding to the capacity for generation.

2.2 To achieve an appropriate portfolio of technologies, resources should be allocated to each energy technology, including energy conservation, to drive their development. The setting of specific targets for each mode to achieve associated CO2 reduction targets would be a transparent way to plan a suitable portfolio. A revision of the Renewables Obligation to encourage output limited ROCs for on-shore wind turbines is just one element of this.

2.3 Monitoring of actual against predicted CO2 reduction is also necessary to confirm and inform scientific understanding and to guide policy and priorities—and to ensure that targets for CO2 reduction are not de-prioritised under the drive for energy generation targets. A qualitative as well as a quantitative perspective on targets should be therefore retained. An appropriate focus and review period of any energy strategy also needs to be set.

2.4 A strategic approach to energy planning between the Welsh Assembly and the UK Government should only be developed in the sure knowledge that the planning framework is able to protect the environment on both local and regional scales from inappropriate development.

3. RAMBLERS CONCERNS IN WALES

3.1 Ramblers feel that industrial scale developments are completely inappropriate in open countryside. We believe that any energy generation facility should not detract from visual, recreational or bio-diversity value of the landscape, either through specific or through cumulative impacts. We are therefore opposed to an undue emphasis on on-shore wind power, where the environmental benefits of an intermittent energy supply are significantly outweighed by impacts to the landscape.

3.2 Wind turbines over 100m in height and wind farms in excess of 100 turbines now exist in Wales. Turbines and associated infra-structure are visually intrusive and physically damaging to the environment and by no means can the land be restored to its former condition. Proposed improvements to energy infrastructure in mid and north Wales raise concerns for further negative impacts to the valued landscapes of these areas.
4. UK Government policy

The driving feature of renewable energy development has been the Renewables Obligation. This policy, however, encourages existing commercially available technologies, and has resulted in a disproportionate emphasis on on-shore wind power. The experience of other countries such as Denmark, who have invested heavily in wind energy, however, suggests that the impact on CO2 reduction targets will not be satisfied through this approach. Indeed, recent reports in the UK, suggest that whilst energy generation targets are being achieved, CO2 reduction targets are not. We consider that the Renewables Obligation in its current form has been ineffective at driving a successful energy strategy, diverting funds to short term, rather than long term solutions.

5. Welsh Assembly Government policy:

5.1 The Welsh Assembly Government (WAG) approach to renewable energy generation is based on the Energy Strategy Wales (2003). This has cascaded from UK and international directives. Implementation, however, is through the national planning process and is heavily influenced by planning policy and planning guidance such as Technical Advice Note (TAN) 8 (Planning for Renewable Energy). The approach incorporated in TAN8 is the adoption of Strategic Search Areas (SSA) and the setting of targets for generating output. The SSAs do not categorically exclude development within areas designated for their natural beauty and will impact unacceptably on countryside of high recreational and amenity value. The target-led approach also focuses exclusively on on-shore wind power but does little to encourage alternative renewable technologies.

5.2 The ability of local authorities to resist inappropriate development under such planning policy is strongly constrained by the WAG-led imperative to meet those energy generation targets. We stress again that such a short term, target led and single technology approach is failing to prepare the way for achieving the long term CO2 reduction targets whilst irrevocably impacting on the local environment.

6. Energy Planning and Local Democracy

6.1 The integration of UK and Welsh policy would appear to be necessary to meet international CO2 reduction targets. However, energy policy, as has been indicated above, can have fundamental impacts on land-use, amenity and the environment. Local and environmental interests therefore need to be fully taken into account. Energy strategy should never be to the detriment, either explicitly or implicitly of local or wider democracy. To ensure this is the case, a clear consistency should be sought between energy strategy, environment strategy and planning policy. Decisions should be made on a sound research basis and kept under regular review.

6.2 Some renewable technologies such as wind energy consume large areas of land, not only physically, but in their visual influence over wide areas of the country. To sacrifice culturally valuable landscapes in a drive for increased energy production we believe is not appropriate. Planning controls/planning guidance need to be able to retain adequate protection of regionally significant countryside resource, even in the face of international targets. Change of land use is therefore a significant consideration factor in any energy strategy, needing increased consideration of the importance of national recreation designations eg open access land, national trails as well as “protected area” designations (National Park, AONB etc). We consider, for example, that the current generation of wind turbines are more suited to off-shore locations.

6.3 Energy related infrastructure, such as power lines and pylons, also need to be considered. From this perspective and from an efficiency point of view, generation needs to be planned to be as near to the point of consumption as possible. UK-wide strategic planning for generation and distribution would be more appropriate from this point of view. Waste products such as from nuclear power stations should also be a consideration in the environmental and fiscal cost-benefit analysis of an energy strategy.

7. Conclusion

The development of an energy strategy, which can contribute to reducing our impact on climate change, is supported.

— Energy conservation and reduction in consumption should be foremost in any such strategy.
— Resources should be invested to drive the development of alternative renewable technologies, rather than focussing on one alternative, such as on-shore wind power.
— Monitoring of CO2 reduction is necessary to confirm the effectiveness of any strategy in line with energy generation targets.
— Adverse impacts to the environment should be a fundamental consideration. The countryside, as a valued national resource, is not expendable.
A strategic approach to energy planning between the Welsh Assembly and the UK Government should therefore only be developed in the sure knowledge that the planning framework is able to protect the environment on both local and regional scales from inappropriate development. Consultation with local and stakeholder interests is essential for an energy policy safeguarding against the possibility that superficial targets may override the interests of the environment.

30 November 2005

Witnesses: Mr Gordon James, Assembly Campaigner, Mr Neil Crumpton, Energy and Transport Campaigner, Friends of the Earth Cymru, Mr Peter Ogden, Director, Mr Geoff Sinclair, Adviser to CPRW on Renewable Energy, Campaign for the Protection of Rural Wales, and Mr Martin Dowson, Countryside Protection Campaigner, Ramblers’ Association Wales, gave evidence.

Q400 Chairman: Good morning and welcome to the Welsh Affairs Committee. Could you, for the record, introduce yourselves, please?
Mr Dowson: Good morning. I am Martin Dowson, representing the Ramblers’ Association Wales. Do you want some background on the organisation briefly?

Q401 Chairman: No, just introduce yourselves first.
Mr Ogden: I am Peter Ogden, the Director of the Campaign for the Protection of Rural Wales. As you can see, we are expecting another colleague of mine; unfortunately they have been delayed on the train, but they are expected in the next few minutes.
Mr James: Gordon James, Friends of the Earth Cymru.
Mr Crumpton: I am Neil Crumpton, Friends of the Earth Cymru.

Q402 Mr Jones: Good morning. My first question is for the witnesses from Friends of the Earth. You have indicated in your submission to the Committee that Wales has frankly an extremely poor record in terms of carbon emissions compared with the rest of the UK. Can you suggest why Wales compares so unfavourably?
Mr James: It is slightly less favourable than England, Scotland and Northern Ireland. Our emissions are, I think it is, 0.3% higher than 1990 levels, where the others are a few percentage points below, so basically they are all doing quite badly and they are all failing to meet the targets that have been set by the government for CO2 reductions. The one factor that separates Wales from England, Scotland and Northern Ireland, I think, is the high level of manufacturing that is in Wales. That is one reason. I do not say that explains it all and really, I think, here somebody could spend some time doing a study into this to find out exactly why we are doing less well than our neighbours.

Q403 Mr Jones: So is the answer you do not really know why?
Mr James: No. The fact that there is a higher proportion of manufacturing in Wales is an indication that this could be a reason.

Q404 Mr Jones: There has been no research into this?
Mr James: Not that I am aware of, because what I found when I was producing these figures on CO2 emissions in Wales was it is quite difficult to get hold of them and I think we were the first to produce them and this is one concern I have. It would be good to have more data available in Wales on our energy performance on those CO2 emissions and other emissions and to have this more readily available to the public. For instance, recently I released figures on the local authority emissions of CO2 in Wales and we were the first people to do that.

Q405 Chairman: Could I apologise for interrupting you. Could you raise your voice a little? It is not your fault entirely, there is some background noise behind you.
Mr James: Recently I uncovered some data on local authority emission levels for CO2 and other greenhouse gases for Wales and we had released this information, we were the first to do it, and I am told that a colleague of mine in Friends of the Earth UK was meeting Elliot Morley that week and he did not know about it, but we would be grateful if the Welsh Assembly Government could provide more data on greenhouse gas emissions and energy use and make them more readily available and more accessible to the public.

Q406 Mr Jones: Thank you. The next question is to the Ramblers’ Association. You state in section four of your submission that: “recent reports in the UK suggest that whilst energy generation targets are being achieved, CO2 reduction targets are not”. Can you give us some more detail about those reports and the figures that they cite?
Mr Dowson: This is just in relation to CO2 reduction and the UK figures related to DTI information which is published publicly. The issue relates to renewable obligation particularly in that respect and the focus on one particular form of renewable energy and the drive that that generates towards meeting the generating target for particularly onshore wind rather than looking at the benefits of CO2 reduction per se, so whilst there is a motive to generate more power, the monitoring in a similar context, as to what my colleagues from the Friends of the Earth have just mentioned, the focus on CO2 reduction as an objective is not as high profile, that is the basis. Similarly in terms of the policy documents and in terms of Welsh Energy Strategy and the Route Map there is very little specifically on CO2 reduction targets for different forms of power generation and again that loses the focus on what we are trying to achieve. So as a general answer to your question, it is an overall UK perspective on are we meeting our
new power generation activities but, on the other hand, as was highlighted today, CO₂ generally is still increasing.

Q407 Mr Jones: In section 2.3 of your report you state: “Monitoring of actual against predicted CO₂ reduction is also necessary to confirm and inform scientific understanding and to guide policy and priorities and to ensure that targets for CO₂ reduction are not de-prioritised under the drive for energy generation targets”. Could you expand on that comment, please?

Mr Dowson: Yes. It is a similar point really. My background is in physics, I was educated in physics, I have done work in engineering. The logic for me is that if within the context of an energy policy and climate change we need to meet targets to reduce CO₂ that should be one of the prime monitors or measures by which our performance is assessed and again, with respect to a lot of the policies, they are very generally worded, generally written, and are not focussed particularly on that outcome, so in a similar way in a recent debate about the Sustainable Energy in the Climate Bill to have quantified targets against specific means should be an appropriate way to guide those directions and we feel that is particularly absent at the moment and I think in terms of how the public perceives the energy package and how it is meeting those climate change objectives, that clarity of how much CO₂ is being reduced by which power generation means is a much clearer justification of why investment should be made into one particular form. Again the obvious one is the emphasis on wind power where the debate about its efficiency and efficacy means that perhaps those CO₂ targets are not being met in the best way and that other alternative renewals might be more appropriately adopted.

Q408 Albert Owen: This is a question to you all. I think, because you all focus on energy saving and on the reduction in energy consumption as a key component in reducing CO₂: Can you outline this in greater detail, what you really mean by that, how is it achievable?

Mr Dowson: I think this is in the efficiency of energy production. If we carry on generating energy, in a sense it will potentially promote increased energy use, so energy saving is a much more supportive way of seeking our targets for climate change improvement. Potentially the ways in which it could be used to generate that have been highlighted through the Sustainable Development Commission. They highlight energy saving as a means of one of the most cost-effective ways of combating CO₂ and means such as education and information to the public as ways they might adopt those, some form of incentives to promote the use of those, such as energy efficiency in the home, providing good benchmarks, for example, by local government, by central government local authorities as leaders and exemplars in energy saving and perhaps the final one in promoting micro-generation and the principle that people generating energy in a community are perhaps more motivated to save energy when they are responsible for the means of output in the first place.

Q409 Albert Owen: Thank you. Mr Ogden?

Mr Ogden: Yes, we would look at it from three points of view. There is the issue of incentives, there is the issue of education and then there is the issue of regulation and clearly the public at the moment do not really equate the switching on the light with the energy conservation agenda, so there is a big task in terms of making that connection. In terms of incentives, then there could be fiscal incentives which reduce things like the rate of corporation tax on business, or the rate of council tax on energy efficient buildings. There are obviously planning gains that can be achieved through sensible good design, energy efficiency designs, things like VAT reduction on energy efficient and low energy equipment, so the whole concept of driving it through fiscal or policy change. Then simple things maybe at the domestic level which is where clearly we are aiming the target and possible introduction of the Smart card technology where people actually understand what are the huge energy burning elements of their life. Really we would be looking at positive statements in terms of education and fiscal policy and possibly, if need be, the regulatory mechanisms.

Mr James: As you see from the evidence we have submitted there is actually a greater significance to saving more energy and we have been critical of the Welsh Assembly Government’s paper, Energy Saving Wales and it is even weaker than the—

Q410 Chairman: Could you raise up your voice a little?

Mr James: It is even weaker than the UK Government paper in relation to efficiency—

Q411 Albert Owen: Can you give some examples?

Mr James: The Defra paper sets targets for reduction of energy use in public buildings and government owned buildings. The Welsh Assembly Government states that we will have an energy study each year to look at how much energy we are using. There is a great difference in that, we would be very critical of that. Clearly energy saving has a huge potential, it has got economic, environmental and social benefits as a classic example of sustainable development, reducing environmental pollution, reducing fuel bills in people’s pockets, helping to address fuel poverty, hypothermia and creating jobs. The National Audit Office, for instance, estimated that the Home Energy Efficiency Scheme created 5,000 jobs a year. This is an ideal solution, I think, for many of the problems we face in Wales, that is why we were disappointed in the Welsh Assembly Government’s failure to do more on this and we were very critical of the fact that we have to look at the areas where the Assembly Government does have power and they do fund the whole energy efficiency scheme and the year before last it was about the only flat line in the Assembly budget, no more money was going to it, and that seems to us to be rather foolish considering the number of benefits
that arise from saving energy. But we also have to be careful, we have known for years that saving energy is a good thing, but we are still using more and more energy and sometimes you hear the arguments, “We don’t need wind power, we need to save more energy, we would not need wind”, but we need a package of measures—we will say more about this later, I suspect—but we have to be careful. For instance, if you have a home and you switch to a renewable source of electricity, that is a 100% switch from coal to wind, if you invest in energy saving measures in the home, what often happens is that people get used to having a warmer home, the thermostat goes higher, and any money they save from lower fuel bills is spent on more appliances in the house, so it does have its downside as well. As well as working for Friends of the Earth, I have also been very involved with the West Wales Eco Centre where we have an energy efficiency advice centre and one thing I would like to see in Wales is the work of organisations like that given more support; they have to spend a lot of time looking for funding to interest, we have to be careful that we are not organisations like that given more support; theyClearly from a landscape point of view, which is our onething I would liketosee in Wales is the work of generations should become Permitted Development. Y where we have an energy e

Q413 Albert Owen: Perhaps that is an area where the local authority could take the lead with its own buildings to start with.

Mr Ogden: I think it is the psychology of it. Micro generation brings the issue of energy closer to the individual and the more that people feel that relationship, then the more that they are likely to be conscious of how they are using energy and how energy can be created in a sustainable way. I mean that we would certainly support the increased use of the micro generation initiatives and we look forward obviously to the Assembly’s proposed strategy on that, but I think there are clearly some issues associated with it which we need to be conscious of. There is a suggestion, for instance, that all micro generation should become Permitted Development. Clearly from a landscape point of view, which is our interest, we have to be careful that we are not throwing the baby out with the bath water, to use the phrase. So, yes, there is an interest, but bringing it closer to the community is important and we would urge that the Assembly Government looks at the hydro area particularly because this does seem to be an area in Wales where there is big potential and that maybe some of the major schemes that have been looked at in the past in terms of the portfolio for the big reservoirs could be down-scaled so that water from those sources could be used more locally in a community context, because the economics to scale are very different for a major company as opposed to a community. So I think personalising the issue would have great merit both in terms of the immediate benefits that CO₂ reductions would bring and bringing it close to the individual.

Q414 Albert Owen: Do you want to add anything? Mr Dowson: Probably just to reiterate really, if this is people’s psychology where the energy has come from, how to adopt the financial incentives to make that possible and feasible and probably in relation to energy conservation new residential buildings, how to make that part of a requirement in planning regulations, that is energy savings and potentially energy generation form part of new build.

Mr James: Is it all right to say something on micro generation? The Energy Savings Trust has recently produced a report and they estimate that we could cut suitable emissions from electricity by about a third over the next 30 years or so, but at the moment we hear that Peter Hain put up PVs on his roof and that David Cameron, I think, is going to have a little wind turbine, but they are out of the reach of most people, they are simply too expensive. I had a meeting recently with a civil servant of the Assembly who is dealing with micro generation and I am very pleased to say that the Welsh Assembly Government is going to produce a micro generation strategy action plan later this year, it is very welcome, and they are going to try and focus it more on the local level to enable people to move forward in this, but we really do have a problem with the cost and I think
whatever we are going to discuss today, we are going to have to keep coming back to, to the cost. I know there are some objections to wind energy, but it is one of the most cost-effective renewable options and whatever we decide to do somebody is going to object. Hydroelectricity, I am not so sure that there is that big a resource in Wales, but also you find that the anglers will be strongly opposed to hydroelectric schemes being implemented, so whatever you do you are going to hit—

Albert Owen: Yes, I fully understand that.

Q415 David Davies: This is to Friends of the Earth. You cited Carbon Trust figures which show or suggest that nuclear power produces 50% more greenhouse gas emissions than wind power. Was that calculated at per kilowatt hour or how was it calculated?

Mr James: I am sorry, I do not think that source is the Carbon Trust for that figure, is it?

Q416 David Davies: That is what I have got here, but I have seen the figures somewhere else in the submission.

Mr James: The Carbon Trust data I used was simply about energy use in Wales, but the figure of carbon emissions from nuclear power was 50% more than wind came from another source—

Q417 David Davies: Regardless of where it came from, do you accept that figure or not?

Mr James: There are a number of figures, there are a number of studies looking at the life cycle analysis, the carbon budget of nuclear power and started off with Dr Mortimer back in the 1970s from Sheffield University at the time of the Hinkley C Public Inquiry produced data and I think at that time he was suggesting that the CO2 emissions from nuclear power were three times more than wind and then you have the—

Q418 David Davies: How do they calculate this? Is it done by looking at the life span of nuclear power station over, say, 50 years and then calculating the total amount of carbon emitted during the process of mining for uranium? I mean there is no carbon emission in the generation of nuclear power, is there?

Mr James: Very briefly, the Sustainable Development Commission looked at the whole business of deriving the fuel, building the power station, but they do not look at decommissioning and treatment of waste. Other studies like the Ocker Institute in Germany, the ex Turner EC Study in 1998, you have got the famous Smith Storm Study from the Netherlands now and you have got the Mortimer Study, but those studies look at the whole CO2 emissions from extracting the old, processing, transportation, construction, decommissioning and looking after the waste.

Mr Crumpton: The Sustainable Development Commission basically said that the emissions from nuclear power and wind power—this is presumably onshore wind power—are about the same, so there is no major difference.

Q419 David Davies: In that case what we are saying in simple terms is that there is no emission in the generation of the electricity, but there is an indirect emission in terms of getting the equipment there, building your wind farm, smelting the iron or whatever, driving the stuff there, there is an indirect emission. Presumably, though, if you looked at it in kilowatt hours and you take into account the enormous extra increase in energy that a nuclear power station generates, then it is a fairly small amount of—

Mr Crumpton: It is per kilowatt hour, so it is all done per kilowatt hour. Just on the point of the SDC, it is slightly unclear because they are estimating that the uranium resource, and there is a big debate about this, the ore quality will go down in future decades and how fast that goes down, which would require more energy to crush it and separate the uranium, and that depends on how many nuclear reactors there are and their study only goes up to 2025.

Q420 David Davies: Just let me be a bit of provocative. Of course there is a bit of indirect carbon emission in terms of putting the plant there, just as there is with wind power. You are not really prepared to accept that wind power generates a certain amount of carbon emissions, because clearly you say in the submission in the myth, “Wind energy will not help climate change. Wind generation produces no carbon emissions”. I think you have already—

Mr James: I think that is from the DTI statement.

Q421 David Davies: This is actually included in your submission.

Mr James: Yes, I have put in the DTI statement on the myths of wind energy, so I cannot alter what they have written, I simply transposed it as it is.

Q422 David Davies: This is a bit of a myth, as an environmental group our top priority surely is climate change and this is what this is all about at the end of the day. It is not about costs or about how many jobs are generated, all that is relevant, but the ultimate aim here is climate change. You are really producing something which you know not to be true, “Wind generation produces no carbon emissions”. You have accepted the alternate figures which show that indirectly wind does produce carbon emissions just as nuclear power does. Surely you ought to be a bit more fair minded if we are to—

Mr James: Really, I think if you have read our submission—

Q423 David Davies: I have.

Mr James: You will appreciate that climate change really is top of the agenda.

Q424 David Davies: Absolutely.

Mr James: And on the news last night again CO2 emissions are rising faster, higher than ever. Every week on the BBC Science website there is new research, it is extremely worrying, but to come back
on this, really when I put in information provided by another organisation I cannot alter that, this is the DTI opinion.

**Q425 David Davies:** It is an error then?

**Mr James:** No, it is on behalf of the DTI, they should have said “directly”.

**Q426 David Davies:** It is a basic error to say that wind generation produces quite a lot—

**Mr Crumpton:** That is an operation, as you have just said, nuclear power as wind power in operational mode produces virtually none, other than visits for maintenance purposes, it is in the life cycle analysis when—

**Q427 David Davies:** Both of them do.

**Mr Crumpton:** Then both of them do to a certain degree.

**Q428 David Davies:** Thank you. I am happy with that. The other question I have got is how much of the Welsh Assembly Government strategic areas identified in TAN 8 are forest land and how many wind turbines would have to be built in order to replace the contribution which the felled trees currently make to—I bet you have not got that one, have you?

**Mr James:** I really do not know if it is up to us to provide that kind of information about how much of the land is forested land. We have many issues to deal with and we do not have time to look in detail at every proposed area, but I am working closely with an environmental consultant, I met him last week, who was working on the SSAs and we shall be working closely with him. If he raises any concerns about adverse impacts on wildlife or birds or the ecology those issues will be brought to our attention and we take them on board.

**Mr Crumpton:** I would just say that the wood harvested would probably either end up in paper, so obviously it has got to come from somewhere, and if the Institute of Grassland Research is right then perhaps some of those areas could be replanted with some energy crop, I do not know, but, why not, we are in an urgent situation.

**Q429 Chairman:** Mr Ogden?

**Mr Ogden:** I think there is an issue about the forestry land because it was very obvious during the consultations which led up to the publication of the Technical Advisory Note that there was an issue about land ownership and that it was going to be far easier to implement this, what we believe is a flawed approach towards the development of onshore wind, with fewer land owners to have to deal with than more land owners and clearly it seems very obvious that the agenda moved significantly towards the public estate, ie, the forestry land that was owned by the Welsh Assembly Government, so certainly whilst we have not got the figures of exactly what proportion of land is within SSAs and forestry owned, it is very obvious that the agenda was driven to a great extent in defining those SSAs by the portfolio of forestry estates.

**Q430 Mark Williams:** Do you, therefore, share the concerns expressed by some about the capacity of wind farms to annexe adjacent land with possible expansion of onshore wind farm sites, do you share those concerns? There are suggestions there is a capacity for wind farm sites, onshore wind farms to compulsorily purchase adjacent land for the expansion of those large wind—

**Mr Ogden:** I mean clearly our position is as in the submission that we have a grave concern about the agenda for onshore wind. We would find it perverse if there were any compulsory purchase powers which any organisation had to acquire land for the purposes of what we feel is a flawed technology.

**Mr Dowson:** I believe there is a report by a consultant which re-studied the TAN 8 areas and they quote 57% of the SSAs are forested land in their study and so if you need information I can probably forward that to you.

**Q431 Chairman:** Could you raise your voice a little?

**Mr Dowson:** Yes. If you need the title of that report I can always forward that to you, but they quote 57% of the SSAs are forested land and they are similar concerns to my colleague in CPRW regarding compulsory purchase.

**Q432 Chairman:** Have you really been suggesting, you have not said it, but I mean I am teasing this out, is there any conflict of interest here that should have been addressed?

**Mr Dowson:** With respect to forestry or—

**Q433 Chairman:** Yes, the policy is being driven in a particular direction, there are passages being eased as a consequence of the relationship.

**Mr Dowson:** I think our general perspective would be the overall onshore wind development we believe is being over-promoted as an overall principle. As regards the forested areas that has a particular aspect with relation to Welsh Assembly woodlands in that they were dedicated for open access and as a walking organisation we believe there is a conflict of interest from a recreational amenity point of view that, having received that right of access a year ago, we are about to have that removed in future.

**Mr Ogden:** It seems to us that the agenda for onshore wind was established prior to all the strategic thinking being completed and that, I think as my colleague from the Ramblers says, the easiest and the slickest way of achieving that was by using the public estate. I mean we had a situation, where the 4 terawatt hour target was actually established before the policy framework was actually derived, so the TAN 8 was the only way in which the land use planning system could look at delivering it and there is no point in having a planning system if it cannot be delivered through the estate portfolio, so we see that there was a major problem in the way in which the TAN 8 agenda was derived.

**Chairman:** We are anticipating similar questions later on actually.
Mr James: Nuclear power produces extremely toxic substances which will be hazardous for hundreds of thousands of years. They do this in order to provide just a part of our electricity. Now this is a huge risk that they are taking. Last year we had a little demonstration in Caerleon when the nuclear industry was meeting there for a conference. We put two volunteers at the gate entrance dressed as Roman centurions just to demonstrate the point that if the Romans, when they were in Caerleon, had nuclear power, they would still be guarding it. So we are running a major risk producing very toxic material which will remain toxic for such a length of time, who on earth is going to be around to safeguard it, to ensure that it does not get into the environment, to ensure that it does not get into unsafe hands, to ensure that it is not picked up by terrorists. That, in itself, is a major concern. In addition to that, if you see what is happening in the world today, there is an awful lot of fuss now because Iran wants nuclear power, which they say is peaceful, others disagree. If we are going to say that we need nuclear power to help us meet our carbon dioxide targets, well it is good enough for any other country, is it not? There is also the real risk of terrorist attack. There have been reports that documents uncovered following 9/11 indicated that al-Qaeda and other organisations were thinking of targeting nuclear power stations. There have been two incidences that I know of in Chechnya and Australia where people were arrested close to nuclear facilities, so those are the security issues. There is the issue of proliferation, how can we prevent other countries saying, “We want it, we want it for civil purposes” and of course then they can become military purposes. It is a huge risk we are running just to provide a small portion of our electricity which can be provided by other means which are probably certainly safer and probably more cost effective.

Mr Crumpton: Just briefly. The amounts of energy supplied to the UK by nuclear power are 3.6% of our energy demand. That is not exactly the primary input, but that is effectively when you have taken all the losses out in generations through steam turbines or whatever, 3.6%, so we have to take that into context. Some people think, in the media as well, exchange energy with electricity with power and say nuclear is 20% and so there is a lot of—

Mr Crumpton: When the CBI talks about 10%—I presume you are talking about the waste?

Mr Crumpton: It is additional waste in terms of you have to look at whether it is in volume or toxicity and I think it is mainly talking about the volume. There are other studies which say that essentially—

Mr Crumpton: The question is this: you stated in your submission that if we doubled the number of nuclear power stations we would produce an 8% reduction in global warming gases. We would have to build probably five times as many wind farms as we have got at the moment in order to make that same reduction, so is this argument in your submission not a case for saying, “Why bother with wind farms either, we would have to build so many of them for such a tiny reduction in the amount of global warming gases that there is not much point in having them”?

Mr James: Wind farms do not leave our future generations with a horrific legacy that nuclear power will leave to them.

Mr Crumpton: Just to take up what my colleague, Mr Davies, was saying there. I accept that there is a poor legacy of the handling of waste thus far and that is not going to go away, but do you not accept that the new technology available and the new generations that are being built around the world, they are far more efficient and I heard a figure yesterday, we can bandy figures about all day I know that, from the CBI which says that the proposal to replace the current nuclear facilities in Britain with new build would only produce an additional 10% which can be stored far more efficiently, which is why countries like Finland are going ahead with this. Do you accept that?

Mr Crumpton: When the CBI talks about 10%—I presume you are talking about the waste?

Disclaimer: The above text is a natural representation of the document in question. The use of this representation is for the purposes of language education and translation, and not for any other purposes.
Q440 Albert Owen: I feel I must push you on this. I am accepting that there is a legacy with the waste, and we can measure like with like and that is what I am asking you to do. I am asking you the new waste that will be produced from new facilities are far more efficient and produce less high toxic waste, because it is only the high toxic waste that—
Mr James: It produces more high toxic waste, not less.

Q441 Albert Owen: Can I finish? So when I accept that we have a poor legacy and we need to manage it better, do you not accept that future generations will handle the waste better, it is a simple question?
Mr James: Oh gosh, no. There can be no guarantee that this extremely hazardous material can be handled safely for hundreds and thousands of years.

Q442 Albert Owen: There are guarantees that it will be handled better than it has been, that is the question I am asking.
Mr James: The fact record of the nuclear industry is so poor I find it difficult to have much confidence in it.

Q443 Albert Owen: Why do you think Finland are going ahead with it then and they have far more efficient storage?
Mr James: If I can come back—

Q444 Albert Owen: Can you answer the question?
Mr James: I am answering your questions, there were two questions. The waste from the new generation of power stations, if you read what Catherine Mitchell has written. Catherine Mitchell was an advisor to the UK Government on energy issues, she had to produce an Energy White Paper, she is now at Warwick Business School, wrote a very good article in The Guardian last year and in that she states, “Yes, there is less volume of waste, but it is more toxic”, so you have really got the same problem, if not a worse problem. In Finland, I visited Finland when I ran the Pembrokeshire Energy Agency, I was twinned with an energy agency in Finland, and I just cannot for the life of me understand why they do not use more timber as a source of energy, but they have decided to go down the nuclear route, and it is quite interesting that the Sustainable Development Commission refers to the new nuclear build that they are embarking on in Finland as being couched in hidden subsidies and the European Renewable Energy Federation has referred the whole deal to the European Commission because they believe it is breaching a number of European regulations.

Q445 Albert Owen: That might be so, but do you not accept that the way that they are storing their long-term high-risk nuclear waste is more efficient than what we have done currently and if we were to follow that technology we would be in a more efficient situation? That is a simple question, we can talk about subsidies and wind and all the others as well.
Mr James: I am not sure what the system is.

Q446 Albert Owen: I suggest you look at it before you make those broad statements, with respect.

Q447 Albert Owen: The broad statements about the legacy lasting for hundreds of years. I think if we do it more efficiently—
Mr James: With due respect, Mr Owen, I do not think that is a broad statement. I think that is a statement of fact. We are producing extremely toxic material which will be hazardous for hundreds of thousands of years and I do not know if anybody can devise a foolproof safe system for storing that material and keeping it out of the hands of undesirables or the natural environment.

Albert Owen: We can be more efficient and that is the point I am making.
Chairman: We have explored that as thoroughly as we could at this point. Could I now return to Nia Griffith.

Q448 Nia Griffith: I think you have actually touched on this really that Friends of the Earth in their submission on page 9 argue that “both the CBI Wales and Wales TUC, make the mistaken claim that nuclear power provided 30% of Wales’ energy as opposed to electricity”. You add, “This is a basic error that significantly overstates the ability of nuclear power to play a meaningful role in achieving energy security and reducing carbon dioxide emissions”. Perhaps if you can just re-state very clearly for us that difference between energy and electricity?
Mr Crumpton: Electricity is probably about 30% of emissions, it is a bit less in terms of actual energy use. I have not got the exact figures, but that is roughly where it is. If Wilfa is going at about 900 megawatts full output and then it is generating about 8 terawatt hours a year, Wales’ demand on a UK capital basis, just dividing populations by total UK electricity demand, is 19.45, so that is about two-fifths. However, Wilfa does not always operate and we have calculated it is about 55–60% load factor overall since commissioning for a 15 months’ outage there, so it can be a major supplier and sometimes not.

Q449 Albert Owen: It is flexible?
Mr Crumpton: It is variable in a different way to wind power.
Mr James: I have picked up those comments from the CBI because shortly before that people were supporting a re-consideration of nuclear power and stating it must be based on facts and I was very surprised that they should have been so loose with their facts on this particular point.

Q450 Mark Williams: You argue in your written evidence, “We believe the Welsh Assembly should be given the powers to both establish more stringent building regulations for Wales and to decide on power station consents of over 50 megawatts”. I can think of a perfect example of a wind farm in my constituency where this was very relevant a few years
ago. Why do you take the view that there should be that devolution of responsibility to the National Assembly?

Mr James: At the moment what we see is the Welsh Assembly really showing a great interest in energy issues and trying to formulate relevant policies, but they do not have the power, the power for most of those policies still reside at Westminster, it is almost like a case of shadow boxing, and I think that they have stated they would like Wales to be a global leader in clean energy and I fully support that, I think it is a marvellous aim, but how can we do that if the powers for most of the things you want to do still reside at Westminster and it does seem a bit strange that powers for other areas, important areas like economic development and transport and health and education have been devolved, but this area has not been devolved, and certainly if you want Wales to be a global leader in clean energy would it not be wonderful to have much more realistic building regulations, much tougher regulations that the housing stock in Wales would be much more energy efficient, this would be a very straightforward thing that we could lead on in Wales on the 50 megawatt power station consents. I think everybody would prefer that Wales could make decisions on this themselves, we need local decision making. On the incidence of Cefn Croes it did not sound very good when the decision was made by a DTI minister in London, it would have been much better if that decision had been made in Cardiff.

Mr Crumpton: Essentially, in terms of Cefn Croes, the local authority supported it, the Assembly did not object to it, so it was a rubber stamping exercise more than anything else at DTI level, Secretary of State, but, even so, we would still prefer those choices to be made in Wales to really address that issue that it has taken a decision in London.

Q453 Mark Williams: Certainly in the context of Cefn Croes it was a big scheme, notwithstanding what was said about the local authority, actually of course you are quite right, the issue of public confidence in a system with any of what we have been talking about this morning to have any relevance at all there has to be a certain amount of public confidence. Certainly in the Cefn Croes debate what there was not was much broader public confidence in the decision that was made, as you say, because at the end of the day it was a signature taken on a letter here rather than Cardiff.

Mr Ogden: And the public feel alienated from the process as well when in fact it is being decided a long way from home.

Q454 Mrs James: On page 9 of your report you say that “nuclear has always been costlier than promised and has always relied on public subsidies”. This argument has also been used about wind energy. Do you have any figures that compare the real cost of wind energy with the real cost of nuclear?

Mr James: The Sustainable Development Commission’s report last week on nuclear power looked carefully at this and they stated it is very difficult to get an accurate figure. There was so many issues to be taken into consideration, the cost of decommissioning, the cost of storage, et cetera, et cetera, but what we do know is that over the years nuclear power has had massive subsidies. We should all remember that of course this was going to be the new wonderful technology that would be too cheap to meter. It turned out to be a nightmare of subsidies and over-spend and if you look at reports, I have got a number of reports here, such as this one from the New Economics Foundation, Energy choices in an age of global warming. They give some very good examples of the cost overruns and time overruns that have repeatedly blighted the nuclear industry which makes it very difficult for us to have faith in what they are saying now, but overall I think the comparisons of wind and nuclear power, wind comes out more favourably, certainly with this report and the Sustainable Development Commission report and other reports. Neil, would you like to say something on that?

Mr Crumpton: Only that the reactor types that may get chosen for the UK, that is the AP1000 and the European reactor that has been built in Finland and none have been built yet so nobody knows. The Finnish plant is a not-for-profit consortium of heavy electricity users, so it is corporate finance. We would not be financing nuclear power stations in that way anyway, so that is very much a one-off scheme, so there is no data from which to really estimate the capital cost of a nuclear power station which is a significant part of its overall costs. It is the opposite with certainly onshore wind where the costs are known to a great degree and essentially falling as the technology improves as it were. The difference in a way is that the wind and energy is fairly new technology, it has been around ten years, and it still needs some subsidies, especially offshore, I would suggest, to enable it to develop and give it a fair chance of competing against what are hitherto traditional
heavily subsidised industries. I think the SDC Commission is probably the best paper I have seen on the subject.

Mr James: Mr Chairman, I think you mentioned earlier we could submit further evidence, so I would like to recommend two studies I have recently come across looking at the costs of nuclear power and renewables and there is one by Steve Thomas of Canterbury University who looks at the economics of nuclear power and he says that many of the recent studies he finds give very favourable interpretations and in his opinion even 4p a unit is a very generous estimate for nuclear power and there is another paper which has just been produced by Professor K Barnham of the Physics Department of Imperial College London in the latest issue of *Nature* magazine where he argues that actually photovoltaics could replace the nuclear contribution cost effectively, you do not need nuclear, it can all be done by photovoltaics, which I think is a very exciting idea that we can down this clean energy path cost effectively.

Q455 Chairman: That would be very helpful if you could send those references forward to us.

Mr Dowson: The cost issue, the waste disposal, the waste management, should form part of those costs. Similarly with environmental cost of either option is an important part of the aspect rather than generation costs per se.

Mr Ogden: I think if I may just add as well that although it is easy to talk in hard economic cost, there is also the cost to the landscape. The environment of Wales is worth £6 billion a year to the economy. If we have a legacy of any form of power generation which is devaluing the importance of that landscape, then the compensatory cost is actually very high in terms of replacing what is a pristine and unspoilt landscape with one which is scarred by any form of development, transmission power lines and the public is denied getting the benefit from using that which so many people come to Wales for.

Mr James: Can I make a comment on that, Chairman? The Sustainable Development Commission looked at the land usage for nuclear as compared to wind and concluded it was comparable, the land usage for the whole nuclear process, and when we talk about landscape, I also think that the landscape in third world countries, in Bangladesh and Africa and the Pacific islands, because those people are not just going to lose their landscape, they are going to lose their land, they are losing everything because of the impact of climate change and if we are saying, rich industrial countries, we are the ones who have produced the gases that are causing climate change, if we now turn around and say, “We are not prepared to have an occasional structure on a landscape to help these people”, then those people are then going to suffer far greater than us. I think we are being irresponsible.

Q456 David Davies: I wanted to welcome, as Gordon has just said, if we need to have a structure that might be unpopular in order to prevent climate change, then obviously we should be prepared to do so. Can we all therefore agree that the most important problem that we face is climate change, the second one is the immediate impact that any technology for energy we have imposes on our environment and very much the third priority is the cost, it is nowhere here the main issue at stake and, as you say, if we need to build something, it may be unpopular, in order to prevent climate change from taking place, then we should be willing to do that.

Mr James: But what concerns me, you see, is almost every solution that is proposed for addressing climate change is opposed by some people, whether it is wind. We have seen wood burning plants fail, we have seen energy crops fail, we have seen opinion polls showing far greater opposition and this is my concern, we are saying, “No, no, no” far too often. The climate change is now such a crisis we have to learn to say “yes” more often.

Chairman: We seem to be going over the same ground. Could we now move on for the moment and I would like to move on to marine technologies.

Q457 Mrs James: I have got a question that is directed to Friends of the Earth and then I have two questions for CPRW. Friends of the Earth have given us a list of renewable projects that could replace nuclear technologies in Wales and this includes tidal lagoons in Swansea Bay and in the Severn Estuary. How close do you think these projects are to being able to generate sufficient energy to replace existing more traditional sources, including nuclear?

Mr Crumpton: I would say that the tidal lagoons, it is difficult to say how much resource could be harnessed. These would be very site specific projects. The Swansea Bay lagoon is essentially a starter scheme to show that the technology works to investors and to get investor confidence going and after that there could be benefits in terms of lagoons, in terms of coastal processes, coastal defences. Denbighshire Council have already stated that there could be a benefit to the Towyn area seafarists by a large tidal lagoon there, so they are a multi-faceted development, but I would like to see one or two schemes built before I would suggest how much could be generated overall around Wales. The estimate put forward by the company Tidal Electric is 24 terawatt hours a year from the Severn Estuary alone, that is about three nuclear power stations’ worth. It also just happens to be slightly more than Wales consumes in electricity terms, but obviously half would be on the English side of the water, as it were. In terms of marine current turbines, which is the underwater wind flower, for want of a better description, the DTI did some resource assessments a couple of years ago and there are maps of the resource around the UK. The red areas which show the highest tidal resource and the areas which are likely to be the most cost competitive, are a certain area in the Severn Estuary, off the Devon coast and particularly around Wales, the north coast of Anglesey and if you look at the estimated total tidal stream resource around the UK is estimated at something like 35–40 terawatt hours a year, that is
10% of the UK’s electricity generation and so that area off the north coast of Anglesey would seem to suggest that there is several terawatt hours a year there and the company developing the marine current turbines have suggested that there may be up to several hundred megawatts, certainly enough to supply Anglesey Aluminium with 250 megawatts average annually. Whether it could produce about the same as Wilfa nuclear power station of about 660, we do not know. We understand that the Assembly Government is doing a resource assessment, they did it a couple of years ago to get everything right. What I would say with objective one, if we were going to go down the marine current turbine routes to generate for Anglesey Aluminium, then we should get the objective one to get the manufacturing base on Anglesey as well and that would begin to tackle the employment issues when Wylfa closes.

Q458 Mrs James: There are two parts to my next question which are to CPRW. You mention in paragraph 2.10 of your submission that the opportunities for developing marine and offshore technologies in Wales are being deliberately suppressed. Have you any evidence to support this claim?

Mr Ogden: I think there are a number of factors. Obviously the evidence of the Friends of the Earth has alluded to the fact that there has not been the incentive, the desire, on the part of the Assembly to promote these technologies. We would also go further by saying that clearly the way in which the agenda for wind manifest itself appear to us to be a positive way of discriminating against all the other technologies which could have the legitimacy of coming forward sooner rather than later, so it was a question of the lack of the incentives to develop the research and certainly there were examples of where individual schemes were being proposed and were not being funded by the Assembly Government. There seemed to be this desire to reject the short-term benefits and the short-term opportunity for marine technology and obviously the mechanics, as I say, of the way in with the TAN 8 process evolved.

Q459 Mrs James: Thank you. You also state that tidal lagoons are reliably forecast to contribute 0.33 terawatt hours per annum of power by 2010. Is this a Wales or a UK figure?

Mr Ogden: That was the figure that was quoted in a Tidal Energy press release, but certainly articles which we have published in our magazine by the Environment Trust which looks at the whole issue and the opportunity of marine technology refers to the fact that this approach and I am quoting, “This approach could provide up to 20% of the electricity demand within 15 years” and that is talking about offshore barrages. So that is the basis obviously for our position in the fact that we believe marine technologies do have this opportunity and take the pressure off the need to actually sacrifice areas of terrestrial land for other technologies which many people now believe are inefficient.

Q460 Mrs James: Would you agree that it is an extremely promising avenue that we should be investigating?

Mr Ogden: Most definitely and, yes, we would obviously welcome any opportunities where those schemes are brought forward sooner rather than later.

Mr Sinclair: Could I add to that? Yes, I would like to say that CPRW is really very much of a one with Friends of the Earth and several other partners as far as tidal lagoons is concerned. That is, of course, just one form of marine renewable which the UK White Paper looked forward to marine renewables very positively. As far as the marine version of wind turbines is concerned, CPRW has taken the view that while there will always be a visual impact on coast lines, the much greater size of installations which is possible in the round two variant of offshore wind turbines, probably gives us an equation which is very challenging, because the amount of generation that it can produce, not only through the size and the extra distance away from the coast now on round two, but also the improved capacity factor which is being forecast for offshore wind as opposed to onshore wind makes the rewards so great that perhaps some sacrifice is called for there if it helps spare the excessive development as we see it of terrestrial wind power. There has been some discussion lately about the extra cost of installing offshore wind and while, of course, that is understandable and inevitable to some extent, I think CPRW would agree very much with Greenpeace who have been quoted recently by saying that what is really needed is a differential, a much more generous form of support for offshore wind compared to onshore wind and I can produce, Dr Francis, an extract from the reputed publication ENDS from which that quotation is taken, if that would be helpful to you. We have now reached the point, by the way, that in England—I do these statistics when I am awake and cannot sleep at night—England has reached the point where the installed offshore capacity from three major and one minor offshore wind installation has now just overtaken the potential for electricity production from 54 onshore installations which has taken, of course, 11 or 12 years to assemble, so that is the stage that has just about been reached in England. It has been advanced recently that offshore wind is actually—

Chairman: Can I hold you up for a moment, because you seem to have drifted into wind power somehow or other. Can I ask Mrs James if there are any other supplementary questions she wishes to ask?

Q461 Mrs James: Not at the moment, thank you.

Mr Sinclair: I was just trying to do the offshore variant.

Q462 Chairman: We may lead into that in a moment, but we are anxious to ask some questions on wind power, that leads us nicely into that.
Q463 Nia Griffith: If we can just pursue the wind issue. Can I just ask a rather unusual question to start with, I do not know whether anybody has the technical expertise, but we are talking about these marine current turbines and we are also talking about offshore wind. Has anybody actually combined the two so that you can have both ends going at once, as it were?

Mr Crumpton: I think the answer is “no”. I mean the marine current turbines are in an early stage of development; several people do ask that kind of question though. The problem is that the marine current turbines would be likely built at maybe one to a few miles off the coast, whereas as wind turbines, for various reasons, the limit is about eight miles, so there is a mismatch between the sea depths where you put marine current turbines and offshore wind turbines of the scale that we are looking at now.

Q464 Nia Griffith: If we can return to the wind in general. What are the advantages and disadvantages of up to 27% of Wales’s energy supply coming from wind and perhaps the Ramblers would like to start?

Mr Dowson: I think in general terms in our discussion about wind versus nuclear, but I think in some ways it is not comparable if a wind is an intermittent source compared to a third generation call, a large traditional sort of windmill looking type of turbine, a 6 kilowatt type as permitted development could perhaps open the back door to everybody doing everything. What would your view be that if you do not like it over the countryside that people could have something on the back of their house, as long as it is the back of their house, and that any individual farm could have, what you might call, a large traditional sort of windmill looking type wind turbine, a 6 kilowatt type as permitted development and would you see those as potential ways forward?

Q465 Nia Griffith: Can I just push you a little bit on that? I do a lot of walking, but Snowdon has a railway on it and I think that is fine, I think it is great that people who maybe do not walk up Snowdon go up in a train and are you saying that there should be a complete blanket, no wind farms anywhere, or would you say let us look at some areas of outstanding natural beauty, let us look at other areas which are perhaps post-industrial landscape or whatever and maybe not have a blanket approach?

Mr Dowson: We are not against renewable energy or wind as a form of generation, it should form part of a spectrum. Our issue is with particularly industrial scale developments because they are fundamentally changing the nature of the landscape. I do not think there has been anything where there has been such a sweeping change of the landscape and to have something which is, the latest quote is 130 metre high onshore, so a 400 foot high turbine in proportion with a landscape of the scale, where your hills and valleys are only 300/400 foot anyway, to our eyes is not in any way acceptable.

Q466 Nia Griffith: Would you accept that there are some areas where you might put wind farms?

Mr Dowson: Yes. I think as we have mentioned before, offshore is an obvious one, but in, sort of, communities, small scale wind farms would be appropriate to have that energy generated close to the point where that energy would be consumed, but on a scale which is appropriate to the landscape and the current trend to larger turbines and to high numbers through the SSA process are really having an inappropriate impact and one which will not go away. The building of tracks, the courage to build those tracks, the foundations, are lasting legacies, despite the claims that they can removed at a later date.

Q467 Nia Griffith: Can I ask the CPR a question? You have talked about permitted development and I am linking this in because obviously if you do not want big scale, you might be more in favour of small scale, but you were worried that committed development could perhaps open the back door to everybody doing everything. What would your view be that if you do not like it over the countryside that people could have something on the back of their house, as long as it is the back of their house, and that any individual farm could have, what you might call, a large traditional sort of windmill looking type wind turbine, a 6 kilowatt type as permitted development and would you see those as potential ways forward?

Q468 Nia Griffith: And the farm agenda as well.

Mr Ogden: And the farm agenda, yes, and energy crops have already been mentioned as a way in which that can be supplemented.

Q469 Nia Griffith: That is what I was thinking about specifically, isolated farms generating their own energy.
**Mr Ogden:** It is this relationship, I think, of the size, the scale, to the form of the location it is in, but I think it also has to be said, and I do not think anyone has mentioned it yet, that the agenda for brown field sites has not been considered properly, that we have a major legacy of derelict land, often in industrialised areas, which has the infrastructure, which has the need and it has the short distances of transmission which would enable wind to be a very, very potent solution to some of the issues and the ENDS report, as I think we have said in our submission, indicates that there is a significant capacity for the brown field locations of Wales to offer that opportunity.

**Mr Sinclair:** We have a recent consent for, admittedly quite a small turbine, in Swansea docks, for example. Maybe the scope for brown field sites is not enormous in Wales, but if the medium sized rather than the ultra large sized turbines, I am thinking of probably in the order of 1 megawatt capacity or less and were deployed on industrial sites, I am quite confident that there are industrial complexes where such turbines could be not only assimilated, but extremely useful as well.

**Mr James:** What I do notice is that when people object to wind turbines onshore they say they will be all right off shore; you put them offshore and you still get a lot of objection. If you site them on industrial location as the Total oil refinery in Milford and on the other side of the Haven at Pembroke the Texaco refinery, strong opposition again. It is quite absurd that the proposal for wind turbines close to the Texaco refinery was turned down. When I ran the Pembroke Energy Agency between 2000 and 2003 I visited the Total refinery and suggested to them that they put wind turbines on their site, it is a spoilt landscape already and we want to see oil companies becoming energy companies. The planning application was announced and then I spent probably eight or ten weeks responding to angry letters in the local newspaper from five predictable sources actually, but wherever you put them you still get the level of objection. Community schemes have been proposed. There is a very good community scheme in Gwaun-Cae-Gurwen, they have had an horrendous time with opposition even though it is a community proposal, so I am afraid that no matter what you do you still face an opposition and if it is not wind, you get opposition with other energy systems. Certainly we are concerned about the landscape as well, I have opposed a wind farm in Pembrokeshire because it is a large wind farm too close to the national park. We have had guidance within Friends of Earth, we do not want wind farms within the National Park, there is room for small ones, small community ones possibly, so the landscape is in consideration with us as well, but it does surprise me that people seem to accept pylons flooding across the landscape. If you have come on the train from Pembrokeshire to London, as I did this morning, you see an awful lot of pylons from Pembroke right across South Wales, people get used to them and then if it is just a proposal for a small wind farm I am afraid you get a level of opposition—

Q470 **Chairman:** Could you pause at that point? I hear what you are saying and you seem to be agreeing to an extent with the evidence we have received from CPRW about the appropriateness, it is not total opposition one way or the other, but would you see a situation arising where hypothetically you would actually argue from Friends of the Earth perspective, you would argue for wind turbines to be located inside national parks and areas of outstanding natural beauty and, if not, why not?

**Mr Crompton:** Can I answer that? I was on the liaison committee that was discussing the strategic search areas and we have never made the point that we would like large scale wind farms in National Parks or indeed in AONBs, there is no need. There are plenty of areas of Wales in those strategic search areas for a start where you could generate a great deal of electricity and the point about going into large wind turbines means you need less of them and there is a trade off there. Yes, there are brown field sites, but there are so few turbines you could get on them.

Q471 **Chairman:** If I could follow the logic of your argument, if I could see it. There are areas of the South Wales Valleys where there is going to be a concentration of wind turbines, particularly in my own County Borough of Neath and Port Talbot, 38%. It would be argued, and I would be amongst those who would argue, and I would commend the recent BBC Wales television series on the Valleys and the last one on the Rhondda actually made this very point about the fact that local authorities and various agencies have made great efforts to improve the landscape of the Valleys back to their natural state. Would you not acknowledge that many of those areas are areas of outstanding natural beauty, are areas which actually should be national parks? Are you actually saying that we should actually see a degradation of those environments?

**Mr James:** It is how you interpret it. I live fairly close to the Llanboidy wind farm and I certainly do not think it degrades the landscape at all. I think it enhances the landscape there. I travel on the train to Cardiff a few times a week and I look across the estuary to the wind turbines on Pendine and I drive through Pendine I see them and I think they are wonderful, I am encouraged to see them and opinion polls consistently show that most people are supportive, even those who live close to wind turbines. I think it is a false assumption to say that they necessarily, I think you said, harm the environment and we are going to have to accept changes, climate change is going to force upon us many changes and I am pleased to say that most of the environmental organisations in Wales, such as WWF and RSPB and Greenpeace and ourselves are much more positive about wind energy than CPRW and the Ramblers. There has to be a balance. I do not think anybody would want to see too many in one place if it is regarded as an area of outstanding natural beauty, but I do not know if you are familiar
with the proposal for Gwaun-Cae-Gurwen, I have seen photo montages of that and I think it looks fine and that, I believe, is not far from Neath.

Q472 Mark Williams: We have had quite a lot of evidence to this Committee and the point has been made about the over-saturation of our landscape by wind farms. At what point would you accept Wales in particular has been over-saturated with wind farm developments? I do not want to get into the realms of micro generation because I think most people would accept that is a massive roll forward, they are needed. At what point does over-saturation really register strongly with you?

Mr Crumpton: I would have thought when public opinion begins to noticeably significantly shift towards “we do not want any more”.

Q473 Mark Williams: Do you detect any change in public opinion?

Mr Crumpton: No, I am amazed that it is held so firm given 10 years of misinformation through the letters pages of newspapers on the subject, I cannot believe we are still so high when there is so much vitriolic comments from certain quarters and so many myths that are highly damaging if they were to be believed that the public have not been taken in by it and their continuing high support.

Q474 Mark Williams: I find that interesting, and I beg to differ slightly on the strength of feeling both ways. I have to say I detect, certainly in my area, that public opinion is changing, if anything, there is a more balanced view than there has been in the past, but we will debate that one again no doubt.

Mr Ogden: I think we beg to differ significantly obviously from the Friends of the Earth and we believe that public opinion is changing significantly against blight that wind turbines are creating in what people now value as their local landscapes and I must come back to the point that the Chairman was making about his home area that we should not think that the only areas in Wales that are important are those that are designated. The AONBs and the National Parks are the gems of our landscape, but they are not the only landscapes that are important and communities are valuing those landscapes which are close to them and things that they can use and benefit from, so I think we have to be careful that we do not partition out our landscapes as the important and the unimportant and that is what the designation process unfortunately does, so we would certainly suggest that both the agenda in terms of public opinion is changing towards wind and the local people value the landscapes that they see that they use and they want to use in the way that they can decide rather than have agendas which are driven by other organisations which do not necessarily take those into account.

Q475 Mark Williams: Would you accept that where public opinion is changing certainly over all these issues concerning global warming, this far greater awareness of the general public at large, and would you agree also that there is a growing interest in the full mix and the perception we have been increasingly driven down. I could say two directions at the moment by certain policies, largely on land wind farm developments on the one hand and the nuclear agenda on the other and the challenge is to find the mix?

Mr Ogden: Indeed, the mix is so crucial and I think that the more the public understand the minuscule contribution that onshore wind technology will offer in terms of reduction of CO2 then the more that they will understand the blight that is being forced upon them in their local areas when these turbines are developed.

Mr Dowson: To feed back on that point, why is there a lot of support for onshore wind? There is an increase of environmental awareness, the general public sees green is good, wind energy is green, so it has got to be a good thing. I think there is automatically an assumption that that is a good contribution. I think until people experience a large scale development, the impact of that is not so great. You see a lot of letters to newspapers saying, “I have got a wind turbine next to my house”. One turbine is very, very different to a set of hundreds of 400 foot turbines in a landscape. The second point would be on the value of landscapes, it is not just about national designations, as Peter has mentioned, the landscape convention is about the landscapes of the communities. We have seen a huge increase in community regeneration schemes to re-value areas which have been deprived in the past and there is also a conflict in recreational interests. We see in forest parks, for example, lie within SSAs within the Neath SSA. That is a direct conflict between the past policies and future policies and wind turbine development affects fundamentally the quality of that experience and detracts from the quality of those landscapes and I come back to what I mentioned before about providing open access. The open access was to enjoy the open countryside. By definition SSAs are placed on upland plateaus, huge amounts of which are open access areas. Sticking huge wind turbine developments on those is compromising the very principle.

Mr James: The concern that we prioritised in our submission is climate change, that is the issue. I regard Ramblers and CPRW as landscapists more than environmentalists, landscape is their top priority. For us climate change is our top priority and I am extremely concerned first at the misinformation that has been put out for years about wind energy, inefficient, intermittent, requires standby, requires subsidies. In fact subsidies of fossil fuels and nuclear power are far, far greater than any subsidies to renewable energy internationally and they have been traditionally, even in the UK, and we are constantly in a situation where, if somebody proposes a clean energy system, somebody will pop up and say, “Oh we have got nothing against renewables, we are all for renewables, but not this and not here and not now”, and we are not making progress. The impact on a landscape is accepted by most people. Sustainable Development Commission examined 50 opinion polls and found there was, I think, three-to-one support. The Llanboidy wind
farm which is about five miles to the north of me where I live, they had a meeting there. One speaker turned up, was allowed to speak, he was very opposed to wind. Fortunately the councillors ignored him and voted in favour of a wind turbine and it is popular. I know the man who lives right next to it, he is very happy with it. I know people who live up past the valley who sit out in the summer having a picnic looking across the valley and they find the wind turbine blades turning can be quite calming. I think it is a myth to say that they are unpopular or they are necessarily a blight on the landscape. But we still emit carbon dioxide, but perhaps 20/30% less, so that is why we refer to it as “clean” rather than “clean”. Mr James: Yes. The clean coal I would say is zero emission, any fuel that is clean is zero emission and cleaner coal is you reduce carbon dioxide by fitting more efficient technologies and we have to be careful that clean coal could create the image that this is the answer to climate change, but it is not really, because even the cleaner coal power stations, the ones which have been fitted with more modern technologies, will still emit carbon dioxide, but perhaps 20/30% less, so that is why we refer to it as “cleaner” rather than “clean”.

Mr Crompton: It is a question of low emission coal rather than less acid gas and air polluting coal emissions. What we would say in terms of carbon capture and storage which would be low emission coal is that we are, in principle, supportive and, I believe, there is an increasing number of MPs are very supportive of the technology and in terms of what David Davies was saying about the cost, we could easily go down a coal and carbon capture and storage route rather than nuclear route, which would resolve all those issues about proliferation, long-term radioactive waste and support potentially another deep mine in South Wales or possibly drift mines in South Wales that is in Pembs, but we cannot have this negative attitude towards wind energy. It generates more than a miniscule of electricity actually, particularly if we develop what is in the pipeline now as we have shown in our submission again, so it has a valuable contribution to make and although before it is built there is a level of opposition, after it is built that opposition often diminishes.

Q476 Chairman: Thank you. Could I, before turning to the last section of this evidence section, perhaps try to bring some sense. There are three words that occur to me in listening to the evidence and I have been struck by the fact that even though you have submitted written evidence, you seem to come together, the three organisations, you seem to agree that there needs to be a sense of balance, appropriate locations and a sense of scale, I suspect. If you disagree with me about that perhaps you could send in a supplementary memorandum about that and we would welcome that. Could I now move on finally to clean coal technology and begin with Friends of the Earth. There was one section of your evidence which slightly puzzled me. You acknowledge that in your words “limited role for less polluting rather than clean coal power stations is acceptable”. Can you explain the difference between the two and why one is preferable to the other?

Mr Crompton: Sorry, I am not quite sure of that statement.

Q477 Chairman: I could not understand the statement either.

Mr James: Sorry, what is that, sorry?

Q478 Chairman: The quotation is “there is a limited role for less polluting rather than clean coal power stations is acceptable”.

Mr James: The first disappointment is that the TAN document is not available on the Assembly website, even though it has been produced now over four or five weeks ago, I believe, I have seen a press release relating to it and you do have exclusion zone around the open cast sites which is welcome. It is not as great, I believe, as the distance applied in Scotland, but we are generally opposed to open cast anyway, they have a landscape impact, they have a health impact, we believe, and an unacceptable economic impact and the mining that goes ahead in Wales should be deep mining, we believe, and not open cast.

Mr Ogden: Obviously we have similar concerns about the massive landscape impact that open cast coal mining could cause, but we really, from the point of view of the TAN, I think we feel it is more a question of the way in which it is actually applied at the local level than possibly the robustness of its content. The concept of actually having areas of constraint, be they high or medium, seems a sensible
approach within those areas where there are primary and secondary resources, but we come back to the point that we made earlier, that one should not necessarily equate areas of high constraint from a landscape point of view simply with those areas that are designated. There are going to be areas beyond the designation boundaries which exist at the moment which have landscape values for local people and those should somehow be factored into the analysis which takes place as to where any safeguarding zones, which are effectively what the TAN is proposing, materialise at the local level. Clearly again open cast has been an issue which has caused a lot of community concern from the point of view of dust, noise, traffic, and I think we welcome the fact that the TAN indicates that very thorough and rigorous analysis of the health, the social, the transport, the environmental impacts, of any new open cast schemes have to be thoroughly analysed in the process of policy making, in the process of planning application determination and one would hope that the strategic environmental assessment process will be transparent in that respect and give local communities the opportunity of making those decisions as to whether open cast is a legitimate form of technology for their areas.

Mr Dowson: Probably nothing major to add on top of that. We will be responding to TAN, but we have not studied that document in detail to date.

Chairman: Could I thank you all for your evidence, both written and oral. It has been a long session, it has certainly been very worthwhile from our perspective and if, as I said earlier, you wish to add to anything that you have said, we would be very, very grateful to receive it. Thank you very much.

*Written Evidence from Wayne Thomas, National Union of Mineworkers (NUM) submitted for the Oral Evidence Session on Tuesday 21 March 2006*

I would like to take this opportunity to submit written evidence in line with the above inquiry which was agreed to on 25 October 2005.

I therefore enclose herewith two reports commissioned by the National Union of Mineworkers and previously submitted to the DTI and others. Both reports are self-explanatory and outline the case for “An indigenous, balanced, diverse, secure energy policy”.

The South Wales Area NUM recognise the fact that we have to address the problem of carbon emissions globally. Although we are deemed to be facing an immediate energy crisis in Wales and the UK, in reality, we are far in advance of other countries such as India and China. We have the time and the technology to consider the long term aspects of policies soon to be implemented and we are grateful to have an opportunity through the Welsh Affairs Committee to express our concerns that the Prime Minister seems to be jumping to the conclusion that the nuclear option will be the saviour of energy requirements for generations to come.

We sincerely believe that coal has a role in the energy requirements both here in Wales and indeed throughout the UK. Admittedly the technology (clean coal technology) that is available has not been utilised into the energy sector as is urgently required.

We all know that the economic growth in both India and China is increasing tremendously. There is a demand for energy in both countries, which is progressively being met with coal fired power stations. Therefore, if there is to be a global attack on energy efficiency and carbon emissions, then surely we must consider this in a much wider perspective.

In our view, if clean coal technology is researched and developed to a high standard in the UK, we will then be in the position to market these skills into other economies to everyone’s benefit.

*30 November 2005*
Tuesday 21 March 2006

Members present:
Dr Hywel Francis, in the Chair
David T C Davies Mr Martyn Jones
Nia Griffith Albert Owen
Mrs Siân C James Hywel Williams
Mr David Jones

Witnesses: Mr Wayne Thomas, Area Secretary, National Union of Mineworkers (NUM); and Mr Phil White, Marketing Director, and Mr Tyrone O'Sullivan, Chairman, Tower Colliery, gave evidence.

Q480 Chairman: Can I welcome you to this session of the Welsh Affairs Committee. Could I also mention that some of the evidence later on this morning will be in Welsh, but not this part of the session. Could I begin by asking you to introduce yourselves, please?
Mr O'Sullivan: Tyrone O'Sullivan, Tower Colliery, Chairman of the company.

Mr White: Phil White, Tower Colliery.
Mr Thomas: Wayne Thomas, General Secretary of the NUM in South Wales.

Q481 Chairman: Thank you very much. Mr O'Sullivan, could you begin by giving us some background information about the current output of Tower Colliery and your projections for the next couple of years?
Mr O'Sullivan: Tower has been here since 1808 (?), so you can quite understand perhaps the next part of my story. Presently we produce about 630,000/650,000 tonnes, predominantly at Aberthaw Power Station; also we sell about 110,000 tonnes of products, which go through the UK plus Belgium, France and parts of Ireland. That is our market; it has been a very steady market for the last 12 years, because we have now passed our tenth anniversary. People say to me the sorrow of it does mean now that we have worked Tower practically right to the last ounce of coal, and I would say, the next two years, according to the speed at which we mine the coal and the demand, and if it is like it is at the moment, it will be dead in two years and Tower will come to an end. Probably people see it as sorrow, I see it as an incredible performance, that we have managed to get there and actually mine every last ounce of coal in the mine, and I think very few pits in the history of mining have been able to achieve that. Although probably it will be a sad moment for me, because I have worked there for 40 years, I still feel that we have achieved an incredible position in life by managing to mine our coal to the last couple of tonnes.

Q482 Chairman: You have anticipated my next question. The DTI have told us that in 2008 Tower will close as a result of what they call “exhaustion”. Would you describe that as an accurate statement of theirs, or is it a question of economics?
Mr O'Sullivan: No; that is an accurate statement. I think that we have got two bits of coal left above us, a bit in the four feet and a bit in the nine feet, and if they were together I think we might have made that last effort to get the coal in, but because they are about a mile and a half apart, the two drivages, to be separate, to get that sort of tonnage, it is not about economics and I think it would be silly to attempt to mine that coal.

Q483 Chairman: So no advances in technology would help you in any way?
Mr O'Sullivan: Twenty million pounds. I could probably take the risk for that. To be honest, I have spent all my life defending mines and trying to stop them being closed and to finish use, but I do think that now Tower has reached the end of its economic life.

Chairman: That is very helpful.

Q484 Mr David Jones: Good morning. Evidence we have taken from United States witnesses tends to indicate that they are very optimistic about the future of coal as a source of reliable and potentially clean energy. How would you rate the future of coal in Wales and the UK as a whole?
Mr O'Sullivan: In Wales, if you looked at, probably you received the document we put out, it is a British Coal document, 1979–80, and it stated that, the pits working then, there were 250 million tonnes of coal left in reserves in South Wales. Much of that coal is in shallow workings and probably could be reached through refining. If I were looking at the coal industry, I think it could be a booming industry in Wales, but money would have to be found. I have got no doubt that there is plenty of coal left under our feet in South Wales, there are a lot of shallow seams, very diverse quality of coal, probably the most diverse quality anywhere in the UK, from steam to anthracite to cokes, you name it, the coalfields of Wales are very diverse. I would say that the future of coal-mining in Wales, if the will were there, would be very powerful.

Q485 Mr David Jones: And the UK as a whole?
Mr O'Sullivan: I am not an expert judge of that. I would say that many a pit in Wales has struggled for 200 years; some of the seams in England still left behind are fantastic seams round about six feet, which I think probably are perfect for mining coal today, thank you very much, with seams of only a six feet to eight feet range. I would say, probably, in
Britain, we have 500 million tonnes still left in England, but I am not an expert in that and it would be silly for me to qualify them.

Q486 Mr David Jones: Mr Thomas, would you like to comment on that?
Mr Thomas: It is interesting you make the remark regarding the UK coalfield. We are all aware of UK Coal, as an industry, being reduced to a business and being further reduced and cut back in the Yorkshire coalfield, as we know, and the Selby complex now has been sterilised. It is interesting, from my perspective, that we see Mr Richard Budge now considering reopening Hatfield with I am not sure of the specific amount of money obtained there but certainly a substantial amount of coal reserves left there. Our concern is that UK Coal, as a company, are sterilising the majority of the coal left in the UK and we have got great reserves of that. The UK NUM officials met the Prime Minister in December of last year to raise these fears with him and if we do not approach it on a UK basis then long our fears are that this coal will be lost to us for ever. How we do that is extremely difficult and really we have to commit to it, and, without going too forward and too deep, renationalisation may not be an option for most people within politics, but certainly I think we have got to consider realistically the way forward for us in five or 10 years. Are we allowing a business to dictate what the policy of the UK energy policy direction is going to be; there are huge issues therefore for us to address. I am sorry to widen it from Wales but really we have got to put it in a UK context and we have got to grasp that. Again, the perspective we are looking at from within the NUM nationally and there will be a spin-off directly to Wales as well, we do believe that a body such as the Coal Authority, who have the licensing rights at this moment in time, possibly could orchestrate, or administrate, the UK coal industry, in some way, shape or form, along with obviously this Select Committee, looking at the clean-coal technology. We really do think there are options there; it is going to be difficult, with huge hurdles to overcome and we think there has got to be joined-up thinking right throughout the UK.

Q487 Mr David Jones: What you are saying effectively, Mr Thomas, is that this is a matter which requires political will?
Mr Thomas: Certainly I think it does need political will and, from my perspective, certainly it does what the NUM have been preaching for a number of years, and probably people are sick of hearing it, as regards coal being a product again in the future and coal being partly an answer to the energy difficulties we face within the UK. Certainly, I think, in conjunction with the energy policy, we have got to take a decision on how we manage the supply of energy from within the UK. We have got those reserves in the UK, we do need a target specifically of how much of the accessible reserves there is and we do need to look at the issue of how we administer those reserves with the joined-up thinking of Scotland, England and Wales, and I think that needs to be addressed as a matter of urgency, as urgently as the energy policy itself.

Q488 Mr David Jones: Of course, the Government has announced an energy review; what are your comments on the timing of that?
Mr Thomas: It is a welcome review, of course. I just need to look at UK Coal, as I say, reducing the workforce, reducing their tonnages, and it is a case of how far we allow the company to carry on with sterilising the UK’s reserves before we take action on that. I think the case for that has already been submitted to the Prime Minister and I have great reservations about how far we allow them to continue to do that.
Mr White: If I could comment on that, Mr Jones, the energy review is getting to a stage where we are getting concerned about the deep-mine coal industry; we feel that it is too late where it is today, but there is need to put pressure on the UK Government as a whole, that we need to push forward and get some sensible review with regard to coal as part of an energy balance.

Q489 Mr David Jones: What opportunities are there for opening other deep mines in Wales, in both the North and South Wales coalfields?
Mr White: Tyrone said earlier that we produced an eighteen million or 10 years. Are we allowing a business to document, which actually was produced by British Coal, back in 1979. We believe that the reserves identified need further research and we do need further information, and needless to say we do need countless boreholes, just to confirm. Questions may be asked as to why we have not done that sort of development research in the past. Unfortunately, there has not been the type of investment or the enthusiasm to look at the coal industry over the past ten or 15 years against the background of it as a declining industry, but certainly we feel that further exploration needs to go forward. We would welcome jointly further exploration. I think it is fair for us to say at this moment, Tower Colliery, as a 100% employee-owned company, has not got the type of money required. We do welcome what further support or aid can be given to further exploration of reserves.

Q489 Mr David Jones: Taking into account the movement of energy prices across the board, do you think that increases the opportunities for deep coal-mining in Wales?
Mr O’Sullivan: If I could just say to you, Tower is in Hirwaun; a mile and a half away there are three old collieries, Bridgealban (?), Treforgan and Pentreclwydau. Within those reserves there are about three million tonnes of coal. Thank goodness, the little mine of Aberpergwm has stayed open, under one manager, and is now working as a very small mine. I believe that we are already in discussion with that manager and his team so that we can take that mine back to have a proper deep-mine status, and probably can have some of our old equipment, which to him would be like new but to us would be secondary, so that we can develop that
mine to produce probably 450,000 tonnes a year for the next ten years. That is a project which has become available only because of the demand for coal today; this was not viable three years ago. Also, the most important thing, it allows us to continue training our workforce. If we lose those skills we cannot pick them up in Tesco, or Woolworth, if you lose those skills, of mining, this is where we need the help in the next two years somehow to continue. There is an opportunity in Wales, and we want the Government to support it, where not only can we develop a deep mine but also so that we can put some experienced workers in there and retrain the next generation. These examples, as Phil has said, can be lost if we do not start moving on them. There are opportunities, there is Margam, of course that is not directly in energy, it would be more steel, but there are opportunities and I would like the opportunity to show that it can be done.

Q491 David Davies: That brings me to my question, which is perhaps a difficult one to answer, but if we were to open up new mines how easy would it be actually to get people who had never been in the industry before to come forward and work as miners, because the image of the job has not been terribly good over the years, as you will appreciate? Also, given today’s health and safety conscious world, how dangerous is a miner’s job; are you still facing a daily risk of miners falling in? Presumably not, as we do not seem to read about them so often, but it must be a risk that is there. Over the long term, I would assume that it is very difficult to avoid the risks of emphysema and other health problems that have occurred with people who have worked down the mines for 20 or 30 years. Do those threats still exist and would you get people to come forward and take up job opportunities there?

Mr O’Sullivan: At the moment, in Wales, and to Wayne afterwards, as the Union, or Phil, as Phil comes from Maesteg, and I am from Hirwaun, if I might say, Abercwmboi, so in fact spread across the valleys, so from that region on our books we have got probably another 300 young people who would love to have a job in mining, because their uncles, their fathers, were all in mining. We have got generations of people working in Tower Colliery now. You are right in one thing; that will not last much longer. It will not last because those people will change. At the moment, probably I could recruit and develop another 200 people through training at Tower Colliery; given another three or four years, that might not be available. Is it safe underground? British coal mines have been the safest in the world. No matter what anyone says, British coal mines are the safest in the world. Tower Colliery—touch wood (it is an old Welsh tradition)—is the safest coal mine in Britain. To that end, I say, yes, I cannot stop the ground falling in, because Mother Nature kicks you in the eye sometimes; you cannot help that, if you are 800 metres underground.

Q492 Albert Owen: Just to ask Mr White, when he talked about the image of a declining industry and a lack of research, do you actually see this energy review which is being undertaken as perhaps the opportunity for you to put the case forward, and, as Mr Jones said, with the prices of energy going up and up, this is the opportunity for that research to be undertaken, and who do you think should undertake that research?

Mr White: I think you are quite accurate in what you said, although the energy review, to date, and consultations and other observations that I have witnessed or heard about certainly do not come out strongly in favour of coal, or really any form of energy other than renewable energy. I do believe that we are mindful of the fact that the coal industry itself must have an important role to play because they will be the one that needs to provide the skills. I think the major energy forums themselves within the UK, and maybe globally within it, whether that is nuclear, whether that is renewable, whether that is coal or any other fossil fuel, oil or gas, what we are all trying to get sensibly here is an energy balance. I am not sure I am even in favour of where we are today. I think we are producing 30% of our generation, our UK needs, through coal, similarly in both oil and gas, and I believe that we are very minimal with regard to renewables. I think it shows that Tower Colliery is a very environmentally-caring company; we have been working on ways of introducing a lower-carbon component of the coal and through coal-firing, and I think we would like an opportunity to elaborate on that at some time later on. I believe, at the end of the day, it needs to be led by industry and not by politicians, with the greatest respect. You do a good job, representing us and the UK as a whole, but really, when it comes to getting serious about energy, maybe as important as at any time, today in the world it needs to be led by industry.

Q493 Mr Martyn Jones: Can you expand a bit on the more general technological and financial obstacles in the way of opening new deep mines, on a UK basis? Maybe Mr Thomas will want to come in on that.

Mr Thomas: I think the problem with that is, the Margam complex, I think, has become more realistic now than it has been for the last 10 years, and I think that is on the basis that Corus themselves are willing to invest in their company to return the coal and coal for themselves. I think, on a wider perspective, the anthracite market is going to be extremely difficult because they have to outlay an awful lot of money to access their reserves, be it drift mine, opencast, or whatever it may be. This is where I think it is going to be extremely difficult for people to outlay their own money into untapped or untested reserves, therefore I think there has to be a solution in boreholes, first of all, satisfying and clarifying what reserves are available, before the commitment will come from private companies. I think that has got to be looked at for the national interest, really I do think so. The Welsh Assembly Government, I believe, are going through the process now of sterilising some easily accessible or easily identified coal and, for opencast, or whatever the case may be, you are aware probably of the two zones there, one
easily accessible and one not so easily accessible. Who is going to pay for the boreholes I do not know, but certainly it would be in the national interest for us to get those boreholes down, identifying, then seek to find out who is willing to commit for the return from those coal investments. Again, following through with that, if somebody is willing to commit their own funding to that, would they get investment aid from the Welsh Assembly Government, or Westminster, whatever the case may be. If investment were going to be committed to those firms, what guarantee have we got, as UK taxpayers, that those investments will be utilised for the purpose for which it has been granted. There is a whole host of issues to be looked at before we give commitment in principle. The first stage, I think, is the boreholes, the commitment secondly is to convince the private investor to commit, and thirdly what sort of support will be given from the Government long term. I think all those issues are extremely difficult issues to address, really I think they are. Coming back to the point, if I may, of the health and safety aspect, we have seen obviously that, with the chronic bronchitis, emphysema, vibration white finger, an element of that has come from, we have inherited that from the fifties, sixties and seventies, dare I say it. Ironically, we have seen a lot of Bevan boys, with two, three and four years' exposure to coal dust, being certified now with pneumoconiosis, so we have inherited a lot of that. I can tell you, with my 20 years underground, we have seen, certainly in the seventies and eighties, that the transformation in the technology utilised is absolutely tremendous and I think if any of you took a visit underground to Tower Colliery even some of the older miners would be amazed and surprised to see how technology has moved forward. There is no coal dust and there are accidents, of course, but it is vastly reduced and, as Phil has touched upon, we are the safest mining industry in the world.

Mr White: With the greatest respect, Mr Davies, there is one individual action, just alone, through terrorism, which is killing more of the people in the UK than the industry itself and heavy industry. We have to have heavy industry if we are going to survive as an indigenous nation of further manufacturing and production; we cannot all be call centres. We understand, we can be as safe as we can, provide the best healthcare we can and, despite what is being said, we have moved on, as an industry, over the last 30 or 40 years and conditions are far better than they were 30 or 40 years ago, but you have got to take them in the light of, if you looked at the UK stats, other than claims for health purposes, they are as good or as safe as anywhere in the UK.

Q496 David Davies: I agree with you. I am more worried about what the public at large think and the attitude that there is out there? Mr O’Sullivan: Monitoring positions are incredible today. At Tower, probably we would send everybody home, and the pit is completely monitored, for methane, overheating, rollers, it is a brand-new game. I lost my father in Tower when I was 17. My great-grandfather was killed in Maerdy Colliery and his two sons were killed on the same day, so I know the history, but you cannot compare that with what modern mining is today. None of us would get in our cars if you looked at those facts, we would stay in the house, our kids would not go outside the house, if you kept watching TV. Our industry has moved on; the monitoring today is incredible. We were the gassiest pit in Britain, Tower Colliery; pre our days. I remember ignitions in Tower Colliery. We have been there 12 years and, touch wood, not one ignition, and monitoring is working. That is the world we live in. One point, and I do not know how we are going to get to these points, but the choice you have got is you are going to have to import 30 million tonnes, or more, and that puts us again in the hands of other people, or we can produce it at home. Forget about nuclear, that will come in again, but, at the end of the day, this Government is going to go down the road of clean-coal technology, it is going to spend money on clean-coal technology, and I believe that will be public money, and they are going to do all that to bring in foreign coal? I find that crazy. I think we should be looking seriously at our coal.

Q497 Mr Martyn Jones: We talk about the most economically-winnable coal, probably that will be opencast coal, I would guess, but there are environmental concerns about that and how would you say those could be minimised? Mr White: Firstly, they have to be identified and I think a lot of the vast resource they have got could be made available and then I think you have got to strike a balance between the ecology, the environment and the economy. I must say, I am getting a very frustrated person, living in a world of NIMBYs today, because I do not think we can do anything. I had a hostile reaction even in my own town, Maesteg, to having a civic amenity site. I would just like to know where we all think we are
going, to be quite honest. I do believe that the importance of us stressing it today is that we need to identify that those reserves are available, and if they are available I think we have got to go through, quite steadily and sensibly, how best we extract those mining reserves and over what periods of time and if we are becoming a bridge. I have got to say, I think it is heartfelt within the industry as a whole that we are not going to meet our targets for renewable generation or renewable capacities by 2011, we are far from it, but we all want to work towards getting it sooner rather than later and I think that the coal industry is a jack on a bridge for the next 20 to 25 years. I think that is what it is going to take us, at least, to build up any form of capacity.

Q498 Mr Martyn Jones: Are you part of the discussions about the establishment of a TAN 8 for coal-mining?

Mr White: From a deep mine opening introduction, there is very little; it is more to do with opencast, as a whole. I think the three of us agree that it is not right that we comment on that, because probably it needs to be felt through the opencast industry itself rather than the deep mine industry.

Q499 Mr Martyn Jones: What would you think needed to be included in a new TAN 8 for mining generally?

Mr White: I will go back and say identification of reserves and that they should be protected and safeguarded until such a time.

Q500 Chairman: Who would you say should take the initiative on identifying those reserves? Is the Union engaged in that?

Mr O’Sullivan: With respect, I do believe that the Welsh Assembly Government have authorised a consultation document with all local authorities to sterilise or look at the potential of, as I said earlier, the two zones. Zone one is the accessible coal zone; two is coal which probably has never been worked. I think that is already being led by the local authorities within Wales. That is my understanding of it and that will tie in with the TAN 8 legislation when it is imposed.

Q501 Mrs James: Croeso. I want to expand a little bit on the coal production because it is something, as a champion of the industry and as a champion of Tower Colliery, I know you have worked very hard on, since your establishment, to develop markets and you have a combination of markets, the power generation, domestic, etc. Given that you have already outlined to us that you have a finite resource and a finite limit on your development, where will those resources actually come from in the future, particularly where Aberthaw Power Station comes into the question?

Mr White: At this stage, what I can say is that, yes, there is a healthy market for coal, and Tower outlined quite early that we do produce and sell 650,000 tonnes, and that is for power generation, for domestic and for export, calcining and other forms of industrial and commercial uses. In the next two years, I do not know where the 650,000 tonnes are going to come from, which will be lost from Tower Colliery: predominantly, we believe they would be imported. It is only fair to say that we were in Swindon yesterday concluding what may be our last contract, with a bit of regret, with RWE Energy for Aberthaw Power Station. Again, can I say how supportive they are, as a generating company, to see coal at least coming back into focus, but I will be quite honest with you, Siân, I do believe it will be through imports. I do not know where else we will determine, or get determine or planning, even if it is open cast coal before a deep mine. I think, despite what we understand, that if we had the opportunity to open up a deep mine tomorrow and that we had support and we had the skills necessary, which we have in Tower, we believe that is going to take three to four years, so you can see our concern with regard to the industry as a whole. If we do not start getting the energy review sort sooner rather than later, we might not have a deep mine industry left to supply the skills.

Q502 Mrs James: You talked about your role, earlier on, as a bridge into the future, into an integrated energy policy. It has been estimated, some information that we have had here, that there are still over 250 million tonnes of coal reserves in Wales. What proportion of those reserves do you think could be recovered by deep mining techniques?

Mr White: I think we want to revisit the Margam and the Glyncastle reserves, identified as far back as 1978, when the National Coal Board, at that time, rather than British Coal, were going to go ahead with those schemes. Needless to say, we know the political climate within two or three years after 1978 to 1979; that was not in favour of coal being in demand for power generation, and the “dash for gas”, etc. I think, quite simply and quite plainly, if you revisited them, the exploration that they require, because it was not concluded or completed by the National Coal Board at that time, I think it is right that we ask ourselves to revisit those two major takes. Fortunately, both of them fall within the Neath and Port Talbot areas. Now whether we say that we specialise in one particular area is a little bit unfortunate to say, but those were definitely the areas identified as far back as 1978.

Q503 Mrs James: And the major obstacles to that; you have told us a little bit about them?

Mr White: The obstacle of being strapped financially, if we had to do it as a private company. Others are, is there any interest or support throughout the financial institutions now for coal, because the price is increasing and the demand for coal is being looked at for the future. We do not know, we need to revisit them, but, I will tell you one thing, we need to revisit them very quickly.

Mr O’Sullivan: They have just brought the productivity scheme back into our industry, of 1978; this is the time for coal, this is the time to drive forward. These coal reserves were established in 1979. I have got no doubt about it, that they were very accurate on the coal reserves left in South Wales.
Wales. In two years, they have just reintroduced the productivity scheme, they are going to go for extra coal; what happened afterwards is a different story. At that time, of the 250 million, naturally, it was a third. Never mind what we do in life, I can tell you now, the colliery reserves we had in Tower, going back, in 1996, we would lose about a third, so I would say you would be looking more at perhaps 180 million, 190 million tonnes. That is natural in coal-mining; as you get to the reserves, you improve or otherwise. We do need some boreholes to reaffirm these areas of coal.

Q504 David Davies: My question is probably to the NUM. Obviously, the big problem we have got with energy at the moment, with gas and with oil, is security of supply; we are importing it from unstable areas, can we be certain that the supplies are going to be maintained at all times. That brings us back to coal. Back in the period you have talked about, the seventies and eighties, the relationship between the NUM and governments of all colours, particularly one though, was not terribly good and I do not think anyone thought the security of supply was there then, and perhaps rightly so. Have we all moved on a bit from that, do you think?

Mr Thomas: Again, I would refer back to what we did inherit, myself included. If you think of coal, Scargill and ill-health, I think those three go together in many people’s minds, to be honest. Mr Scargill is retired now, as we know. We have got two new officials at the helm of the National Union of Mineworkers and, as I said earlier, they met directly with the Prime Minister, so that goes a long way, for me, in clarifying that we have crossed that bridge, I tend to think. I think we have moved forward tremendously. There are trade union laws in place now, there are viewpoints on those laws, of course, but I think we have moved forward tremendously from the eighties. We are in 2006; we are willing to go forward if we need to go forward. The argument we are putting across is that the product is as important to the mineworkers of the UK as it is to the general public of the UK. Surely I cannot see a situation where we would come across the situations we have referred to, back in the seventies and eighties, ever again and we just cannot see that, to be perfectly honest. Logically, as Tyrone has touched upon, the workforce in Yorkshire are coming to the late forties, early fifties, in age, and before long they will all be coming to an end, so to speak. The youngsters coming into the industry, thankfully, did not go through the process of strikes and the disarray within the industry and therefore I think there is a totally different outlook to it, there is a totally different outlook to the product and there is a totally different outlook to the energy requirements of the UK, so I think we have overcome that, from the NUM perspective.

Q505 Albert Owen: You mentioned financial help and support. The UK Government has stated that it is spending over £500 million on emerging renewables and low-carbon technologies, in the form of both grants and research and development. What assistance do you think the Government could give to benefit coal production?

Mr White: I think that could be included in a balance. If we look at coal as a solid fuel form and we look at many biomass streams as a solid fuel form, I think the combinations of coal-firing and dual-fuelling and overcoming the complexities of utilising all these solid forms of fuel, or energy, today, is something, in itself, which should be blended to the industry. I keep going back, but not to be too repetitive, first we do need to identify the amount of coal reserves, because it does not necessarily all have to be used for power generation.

Q506 Albert Owen: A specific with it, they say research is part of that, and the question I really want to ask you is, and it is a follow-on from the earlier question, have you been able to access that money, either from the Welsh Assembly Government or from the DTI? You have said that industry would play a big role. I am suggesting to you that it is both, it is Government and industry and that some of those subsidies are needed.

Mr White: I can answer on behalf of Tower. We have played our part in developing coal for other uses and other resources, and we are a part of a current DTI clean-coal technology programme on co-firing. A disappointing factor is that the DTI scheme is in a major clash with Ofgem, because we were actually blending coal and biomass at our Colliery but it was not allowed in to be generated at Aberthaw Power Station because they wanted more rigorous quality control checks, etc. We have been slightly let down from developing where we have been for the last few years because of a clash of interests between Ofgem, the regulator, and the DTI themselves, who actually hand out the programmes on clean-coal technology.

Mr O’Sullivan: I have spent all my life in the industry and our industry was destroyed unnecessarily in the political bloody game, and that is a tragedy, and look at where we are today, and I cannot leave that unsaid. It is “make up your mind” time. The rest of the world has decided to go for coal and the production is going to double in the next 15 years. If we are different from the rest of the world in Britain, and somehow we could have had the magical formula, deciding it will be nuclear, because green cannot get there; it cannot get there, you can do what you like, you can play with as many little windmills as you want, green cannot get our country into the next era, it is bull. Spend money on tidal; the rest is a waste of time. I would love to be there, I would love to have the clay on my head (?), but let us not bull any more. The choice you have got is either you go for coal or you go for nuclear. Go for foreign coal if you want to, but bloody tell us; tell me so I can tell my kids, in my community, what is in front of them. What we could do is go for our own coal, we could develop our own technology, we could start building the things and manufacturing things using clean-coal technology, and if we do not do that, with India and China, we are gone. We are fiddling while Rome burns.
21 March 2006 Mr Wayne Thomas, Mr Phil White and Mr Tyrone O’Sullivan

Q507 Albert Owen: That takes me on to the next question I wanted to ask you. Can coal compete with renewable energies, such as wind; obviously you are very clear on that? You mentioned wave and tidal; they are options, as part of the mix, but can coal compete with it?

Mr White: It is the level playing-field being which industry is the next to be subsidised. We have gone through the issues of gas, we have gone through coal; the only sensible energy policy we ever had was under the Labour Government in 1977, with Tony Benn, where coal was the vogue just then. The Energy White Paper emphasised the importance of such approaches of co-firing, coal and the emerging renewable industry, but yet we see the Forestry Commission, for example, in Wales making available only 100,000 tonnes of wood tree thinnings, chippings, residues. In the overall state of play, where we are in terawatt generation, we are two gigawatts down on what we require in South Wales as a whole. The biomass renewable industry itself as a solid form is going to be a very small player. What it does for the coal, I keep emphasising, is it can reduce the emissions for which coal is being blamed in the world today. We have Aberthaw Power Station investing £100 million in FGD (flue-gas desulphurisation). There are other technologies; there is a range of clean-coal technologies. It is exactly as Tyrone said, while we have been sitting back in the UK, with a lead 20 years ago, we have sat back for 20 years, every other country which has got an interest with its own indigenous resource of coal is pushing forward on clean-coal technology.

Q508 Albert Owen: Mr Thomas, on the same line, do you think coal can compete?

Mr Thomas: Yes, very much so; very much so. I tend to think that we do need to take to heart the issues and we have got to face the facts and look at coal as a product and the technology as it stands and we have got to make a decision based on that; the old baggage of the past has gone. We have got to make a decision, where we are going to be in five or ten years’ time, how we are going to replace the coal-fired power stations now, the nuclear power stations in 2010; we are going to be in great difficulty unless we make realistic decisions today. We have got harsh realities to face up to, but we need to take a wider perspective, as Tyrone has touched upon; globally there are many issues to do with coal, many positive issues to do with coal. It would be a sad day were we to be left behind in that decision-making process.

Q509 Albert Owen: What do you think would be the best single form of support that the Government could give to the coal industry, from your perspective; we have heard from Tower?

Mr Thomas: Assistance in exploration and identifying specific areas of accessible coal. I think, from the Welsh perspective, that would be assisting us greatly to get there. Again, the difficult decision would come then from different companies, to see whether they would be prepared to invest, and then we need to see whether it would be assistance or subsidies, for want of a better phrase, to make that commitment. Really we need to identify, first of all, accessible reserves and then we need to take a stage as regards committing to accessing and working those reserves. I think we need assistance in identifying the boreholes and then we need to have a discussion on whether subsidies will be available for those companies on that basis, but unless they get a commitment for the long term no private company is going to give that commitment, unfortunately.

Q510 Nia Griffith: If we could move on now to speak specifically about the clean-coal technology, I have got to say that, on the recent Committee visit to the United States, we were extremely impressed by how advanced this technology is. We had not really realised, on this, just quite how much they can do, and particularly the way they were using even the carbon capture to get out oil. I believe now that Statoil, a Norwegian firm, is doing that with a gas-fired station in the North Sea, so obviously there is tremendous potential there and, as you said in your review and repeated just now, the issue is that we were ahead of the game 20 years ago. Can you try to clarify for us perhaps where we are now, in terms of UK research, and then what you feel the UK Government is doing at present to increase that development, and finally what should they be doing? So, to start off with, where are we now, what the UK Government is actually doing about this clean-coal technology and what you think they should be doing, because, as I say, we were impressed with the potential there?

Mr White: I think the only movement we have seen in the UK in the last 20 years has been the application and the retrofit of FGD; really that is about as much as we have had in the UK. If I could elaborate on the other opportunities for clean-coal technologies, the IGCC has integrated the gas, the combined cycle of converting the coal to gas; the Americans, I believe, are well ahead of the field there, so are the Japanese. We have got the AFBC, the atmospheric fluidised-bed combustion; the coal is burned on a bed of inert material. Again, those technologies have been advancing in most other countries throughout the world. The pressurised fluidised-bed combustion, the air-blown gasification cycle and, of course, the most deadly one that we have been advocating for such a long time is the combined heat and power plants. All these are very much suited to coal, but I do not believe that I have seen any DTI clean-coal technology programme which has moved on from where we set them out ten or 15 years ago. I think there has been an allocation of £10 million released recently for further exploration under clean-coal technology. I think what we are trying to do is reinvent the wheel because they want to pacify us, personally. I do not think we have made any advances from where we were 15 or 20 years ago, on anything other than FGD being installed on a number of our coal-fired power stations in the UK. That is a shame. I think we have got the ability, it has been industry-led, the question was asked earlier, and there are major roles for the universities. We work with the universities, we work with the University of Glamorgan; we have
Mr White: I think it is only fair to say, as regards Statoil and other forms of carbon sequestration, there is work being undertaken and work carried out by others, better known in their research, I think that is something we commented on earlier, really again that is for others. It is there, it can be proven; the dangers, again, we do not know the extent of them, or how small they may be.

Mr O’Sullivan: The problem is, if you look at our valley, Cynon Valley, we have had about seven mines there, I can tell you this, you could not guarantee that gas would not come to the surface somewhere. There are some very deep mines in Britain which may have that option, but I would say, if you look at gas, it has been under the ground for millions of years, has it not, and never found its way to the surface, and man had to go down for it. I do not think I could say the same for coal-mining because there are so many holes in the ground.

Q513 Nia Griffith: What seems a better option, that it goes somewhere under the North Sea, or something?

Mr O’Sullivan: Yes, it has got to be there.

Mr White: How do you monitor it? In a working mine, I would say, if we felt it would be safer not to introduce then that would be the case, because obviously we are there and working it. In abandoned mines, how do you monitor it, and again further research is required, or in other countries are they that far advanced, then we do not have to reinvent the wheel, we just have to copy them.

Q514 Nia Griffith: Would you agree that we have actually got space under the North Sea and it would be preferable to use that rather than, as you say, mines which have got exits?

Mr White: Presuming we pull all our oil and gas out of there; we should have plenty of room in there now, should we not, we should have a major vacuum.

Mr Thomas: That seems a much more realistic option as it stands, because I think the strata, as Tyrone has already said, once you extract the coal from there you are breaking the strata therefore you are breaking the seals within the geography itself. I would have great difficulty with South Wales because predominantly the mines are close to the surface anyway, if you break the strata you have broken the seal, in effect, so I would welcome further investigations on that, but at this moment in time I think the research has to be for the North Sea option.

Q515 Hywel Williams: You have already referred to using methane in Tower. Can you tell us how that is done and what use you make of the methane, you referred to electricity production?

Mr White: Yes. It was not done under British Coal, it was done under Tower Colliery as a private company. We have to extract the gas for sale mine coal production anyway and that is transported out through the mine and up the shaft, predominantly it is pumped away; the holes are bored at the coalface, it is then pumped away, up to the shaft and it hits the
interface. That interface means then that the gas is collected, cleaned and put onto gas turbines and generated, and we generate close to nine megawatts. That was not done until Tower Colliery came back as a private company. We had done that with Hyder, at the time, it was good to have the two Welsh companies working together, which we did, I do not know whether they are now, whatever company they are and controlled by whoever, but we have got a good practice guide of how we actually crack the gas, bring it to the service and generate.

Q516 Hywel Williams: That electricity is used just within the mine itself, is it?

Mr White: Yes. It is playing a role of about 30% of our consumption needs at this moment.

Q517 Hywel Williams: There was a reference earlier on to using mines to store carbon dioxide. Just looking at methane extraction, is there any scope for using carbon dioxide to push out more methane than you are expecting at present?

Mr White: Again, it is something similar to what has been looked at in the USA, in particular. I do not know how proven we are to say how efficient that is. I think, when we look at the costs, the costs certainly outweigh the advantages of doing that, at this moment in time. It is something that should be looked at and I am not sure whether it would be coming too late for the industry if we did that, so we may be a contributing factor to having something done of a global nature rather than a UK or Welsh nature of affairs.

Mr O’Sullivan: When you say the practical side of it, one example I can give you is Tower Colliery. The next pit to this is Glyncorrwg; that finished mining many years ago. The story over the years was that had built up with methane and it had become practically a gasometer; none of that went to the surface, it remained sealed, underground, as a gasometer. Then, about five years ago, we had a bit of an earthquake, which never in our history had affected us before, and actually caused a crack through from their mine to our mine; after six months we could not even go to the mine because of the amount of gas pouring out of it. We have captured that gas now, we have put in a line. That is the practical experience, that you can store, but it would not be for us, we had one little mine, a workers-owned mine; we do work with universities and others. That is a perfect example of gas being stored underground for 30 years, which then we tapped and used to generate electricity in Tower Colliery; so there are proven examples that it can work, but where else in South Wales I do not know.

Mr White: There is the opportunity of the hydrogen economy; we could go on and on, could we not. It is all based around what we do with coal, what we do with mines, do we re-open them, do we keep them working where they are. I do not think we can go to abandoned mines. I keep seeing something in focus now going “abandoned mines, abandoned mines.” No. I think if we can develop a mine, develop mines for more than producing coal, and look at it as an opportunity for carbon sequestration and hydrogen.

Q518 David Davies: I am being a bit mischievous, but actually to put a serious point, does not your experience with capturing methane and reusing that, something that was done, as you say, by a private company, rather demonstrates the benefits of not being nationalised, the fact that actually you can put ideas to work like that without having to go through a whole rigmarole first, and you have that incentive to do so?

Mr White: It was done, essentially; it was done under the Coal Board and British Coal. Again, I have to say, we are not here to reinvent the wheel. All we have done is, essentially, we have seen it as an economic benefit but also it was economically beneficial to the National Coal Board and British Coal. Just because we were a private company it did not mean to say that we had the advantage of doing that; a lot of it was undertaken under the Coal Board and British Coal.

Q519 Mrs James: I am going to use that very trite “in unity there is strength”, that there needs to be a lot more co-operative working, there needs to be a lot more sharing of technology. I do not think that we can see it in isolation, of small companies taking on huge burdens. You have talked very much about the Government and its role and the Assembly’s role; are you convinced that is the way forward?

Mr White: We can be at least one of the peas in the pod, can we not; we do not know why. We think that a lot of people know a lot more than us but I think it is fair to say that we are always prepared to give it a go and give it a go if it is right economically, give it a go if it represents the best interests in doing what we are going to be committed to doing. I guess, overall, we culminate those decisions to ourselves a lot more easily, but there are disadvantages of being the type of company we are, too, against that background.

Mr O’Sullivan: I do not think we have got a choice. It is public money and somebody has got to start spending it. We have got to stop kidding ourselves. Either you spend it on nuclear or you are going to spend it on clean-coal technology, importing foreign coal, or you can spend it on British coal; but you are going to spend it, do not kid yourselves. I will come back in ten years time and wag the stick and tell you “It’s the way you spent it,” but you are going to spend it; make up your mind where you are going to spend it, but it is going to be spent, it is public money. You cannot have energy today without governments taking huge parts of that resource, you cannot have it; it is a fallacy to think that some private company can do it. Rubbish.

Q520 Mr David Jones: Mr O’Sullivan, you seem to suggest that the choice is between nuclear and coal. Would you not accept that it is quite possible to have an energy mix which includes both nuclear and coal?

Mr O’Sullivan: Yes, I will accept that.

Q521 Mr David Jones: You just said it was either one or the other?
Mr O’Sullivan: It could be both, I quite accept that. I believe, at the moment, you are not talking both, you are likely to be talking nuclear, or imported coal.

Q522 Mr Martyn Jones: The DTI also told us about your briquetting plant, where you are combining coal with waste. Can you tell us a bit more about that?

Mr White: We are not producing it in the quantities that we require.

Mr White: Yes. The market was against us, four or five years ago; initially, we felt that we had an opportunity of utilising multi-fuel, in coal and biomass, but we did start actually on waste and the refuse-derived fibre and we have been able to produce pellets and briquettes with coal and refuse-derived fibre or waste derived from municipal solid waste. We have broken the back of that. Subsequently we have worked on other biomass streams, predominantly wood, waste woods, sawdusts, we have worked with wheat, we have worked with olive expeller, more cereal products. We have worked on producing organic binders, like the old phenol and molasses-based binders, we have done a lot of that work; time is running out for us finally to conclude and complete. It has cost us an awful lot of money, I have got to admit, but, it is what Tyrone said earlier, you have got to do it or you die, against a background of emerging; we feel that work needs to go on. We have not had the technical support I think we would have liked to have, but, as I said earlier, we have had universities, like the University of Glamorgan, working with Proctor’s of Burnley on a one megawatt chain-grid stoker, to prove the point that, by combining coal and the waste, or coal and biomass, you can get the right kind of equipment to monitor the emissions, because you are constrained through the Environment Agency about the type of monitoring equipment. The briquette plant is there, it is a new plant, it is still being worked on traditionally to produce those multi-fuel-based products. I keep reverting back, if we can look at coal as solid fuel and look at the renewable industry split into wave, tidal, wind, as we said earlier, and solid fuel forms. A concern again is that every time that we wanted to make advances with regard to producing products for the domestic market we could not get the source of the biomass; we could not get the source of the biomass. Biomass streams that were available five years ago of giveaway were problems, they have now turned around, that the cost outweighed the production cost and the availability was not there.

Q523 Mr Martyn Jones: You have touched on my next question, Mr White, because one of the problems that we have at the moment is that everybody is competing for sawdust, it is actually a feedstock for the chipboard and MDF industry?

Mr O’Sullivan: It is actually damaging one of our industries to go into biomass fuel, which is a problem. I am interested that you mentioned also you are looking at refuse waste, which is far more easily available?

Mr White: If we look at the Biomass Task Force, of the last Commission, I think headed by Sir Ben Gill, mentioned in there quite clearly is that waste is overlooked as a resource. We have been fighting the issue for waste, to say it is as good as biomass—it is as good as biomass—the only difference is that you need the monitoring equipment because we do not know what everybody puts into the black bag or your bin every day of the week. Now we are getting to such a consistent source of fibre as a fuel and not compost and, may I add, for our interest, it is energy and not compost, because I felt at one time in Wales we were going to be swimming through compost, but we have moved on to look at it as an energy value. Combined with coal, it has a future, it has potential, and Ben Gill and his team identified it, it is a resource and not a problem, it is a solution, and all that has become available, through the technologies, to convert the MSW into waste-derived fibres, such as a mechanical biological treatment and aerobic digesters. We can solve two problems in one; we can produce energy and take waste as a resource rather than a problem.

Q525 Mr Martyn Jones: Have you got a market for the briquettes yet?

Chairman: Could I thank you all for your evidence, both your written evidence and your oral evidence today and, despite all the problems that you have outlined, for your enthusiasm and your sense of the future. I am reminded, of course, in the matter of Tower Colliery, of the words of Benjamin Franklin on your banner, “eternal vigilance is the price of freedom” and you have certainly endorsed that very much today. Diolch yn fawr iawn; thank you very much. 
1. Security and Diversity of Supply

Will the Committee investigate the potential outcome of the same level of financial investment (as for a new build nuclear power station and its full life cycle costs) into micro-generation supply (based on renewable resources), throughout the length and breadth of Wales in every sector of society (commerce, industry and residential, etc), and the resulting implication for security and diversity of supply?

2. Justification of Risk

Will the Committee investigate in full the basis of the Welsh Assembly’s input into the joint decision by the Secretary of State for Environment, Food and Rural Affairs and the Secretary of State for Health on the justification (para 199 of The Draft Magnox Decision Document, October 2005) that the risk of terrorism from the operation of nuclear reactors in Wales is acceptable because it remains small?

3. Continuing Operation of the Aged Magnox Reactors at Wylfa

It is argued the benefits include profit from the continued operation of Wylfa up to 2010. How do the level of profits compare with the full cost of decommissioning and permanently disposing safely the intermediate and the high level radioactive wastes generated at Wylfa over the next 240,000 years? Will the Committee investigate?


Continued operation of the aged Magnox reactors is akin to running an old vehicle near enough into the ground, an indulgence in brinkmanship when it comes to things nuclear. If these reactors are kept running beyond the original design life of 20–25 years, the need for testing out real-life emergency preparedness is paramount.

Will the Committee call upon Magnox Electric to demonstrate its duty of care to the population of North West Wales by practising comprehensive emergency exercises every year from now onward, directly involving the whole population of Anglesey at the very least?

In particular, will the Committee ask Magnox Electric to undertake the first of these exercises this year, involving the emergency planning evacuation of the entire area within the 30-mile radius (48 km) of the nuclear power station at Wylfa?

That exercise is the only means of establishing a proper baseline for every aspect of the efficacy of emergency preparedness at all local and community levels, addressing the needs of all sectors of the population (older people, elderly infirm and bed bound people, infants, as well as disabled people and able-bodied people of all ages, in all sorts of real-life circumstances). Remember, large numbers of Anglesey residents not only work on the mainland but also have relatives and loved ones living on the mainland.

Even the Inquiry Inspector for the Hinkley Point “C” PWR Public Inquiry recommended emergency planning arrangements within a radius of 40 km (Report Volume 7, HMSO 1990).

5. Nuclear Wastes: Past, Present and Future Legacies

Will the Committee establish the availability of a permanently safe and reliable nuclear waste dump in Wales, and the time scale of operations?

The logic is as straight forward as the ethical and equity principles at stake (under sustainable development). No permanent nuclear waste dump in Wales: no nuclear generated electricity in Wales. Exporting the long-lived highly radioactive and radiotoxic wastes from Anglesey to Cumbria, for dumping in the Irish Sea or in a hole in the ground somewhere else, does not make Wylfa “clean”. New replacement reactors at Wylfa inevitably mean creating additional new nuclear wastes on the Isle of Anglesey.

Will the Committee investigate the ethics and justification for continued operation or new build of nuclear power stations in Wales in the context of insoluble perpetual legacies of nuclear wastes?
6. **Anglesey Aluminium Metal and Nuclear Electricity**

Does the Committee consider it ethical for Anglesey Aluminium to hold Anglesey to ransom on a replacement nuclear power station or extension of the operating life of Wylfa nuclear power station?

Will the Committee investigate:

Why did the company not immediately take up (in the words of its Managing Director Ron Douglas) “the most sensible option” feasible identified previously by the company (namely, building a gas-fired power station on Anglesey in order to meet the company’s future needs: *The Daily Post, 25.01.2006*)?

Why has the company now decided to frighten the people of Anglesey into submission by threatening to close the Penrhos site, having known since 1995 that Wylfa was doomed to permanent shutdown subsequently?

If the smelters at Penrhos are dependent on nuclear electricity, will the Committee establish from Anglesey Aluminium precisely what the company proposes to ensure the environmental containment of the attendant nuclear wastes for the next quarter of a million years (the complete decay period for all the radioactive and radiotoxic elements making up the nuclear wastes)? According to the Government (para 2.3 DEFRA/DOE/National Assembly for Wales/Scottish Executive, consultation 2001), these radioactive wastes need to be “segregated from the environment and human contact” for “hundreds of thousands of years”.

Does it concern the Committee that a company jointly owned by Rio Tinto Zinc (51%) and Kaiser Aluminium & Chemical Corporation (49%), two of the world’s largest multinational corporations, should:

(a) balatantly seek to manipulate public decision making on the future of the Wylfa Nuclear Power Station; and,

(b) in the process, dump the responsibility for the historic and the continuing production of radioactive muck on to someone else (which, in the final analysis, means the future generations of taxpayers); and,

(c) plead special favour for cheap supply of electricity in contrast to the cost of electricity supply for all other local businesses in Anglesey?

Given that both reactors at Wylfa were shut between 10 January 2006 and 13 January 2006 (following a fault causing the loss of electrical power for reactor monitoring system), what happened to the smelters at Anglesey Aluminium during that shutdown? Similarly, what happened to Anglesey Aluminium Metal when Wylfa was completely shut for 18 months between April 2000 and September 2001? And, subsequently for a month between July and August 2003?

7 March 2006

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**Written Evidence from Welsh Anti Nuclear Alliance**

**Introduction**

The Welsh Anti Nuclear Alliance was formed 26 years ago as an “umbrella” organisation for individuals and groups of people opposed to the expansion of nuclear power and the dumping of radioactive waste, and in favour of the conservation and rational use of energy.

It has presented evidence to three major public inquiries, and submitted evidence to several House of Commons committees, and to the Government’s first Energy Review. WANA submitted evidence to that review on 7 September 2001, four days before the attacks on the World Trade Centre and the Pentagon.

Within a month of those attacks a seminar was held in London at which the proponents of nuclear power made their case and set out their requirements for public subsidy. Asked how they would respond to the possibility of terrorist attacks on nuclear power stations, the reply was “Where there is a will there is a way”. WANA evidence is attached as appendices.

**The Current Energy Review**

It is the position of the Welsh Anti Nuclear Alliance that people still advocating nuclear power as the “solution” to global warming are deluded. There is no need for a second energy review. We have already had a “mature debate” and its conclusions were sound.

The Government’s 2002 Energy Review examined the cost of nuclear power, both current and future, in great depth. It concluded that when compared with actual experience the projected figures put forward by the nuclear industry were extremely optimistic.

The large and relatively inflexible 10GW investment programme proposed by the nuclear industry was rejected, and it was concluded that there was no current case for further government support. Even if the costs of future generations of nuclear reactors were lower, public concerns about radioactive waste and the perceived vulnerability of nuclear power stations to attack may limit or preclude their use in the longer term.
The Sustainable Development Commission has pointed out that one of the implications of a shift in emphasis towards nuclear could be to further weaken the commitment of Government, and therefore the investment community, to renewables and specifically microgeneration technologies.

**THE EFFECTS OF PRE-LICENSING NEW REACTOR DESIGNS**

The reactors that the nuclear industry want to build have not been built or tested anywhere in the world, and appear to fail the safety assessment principles that are used in the UK to regulate nuclear safety. It will be difficult to carry widespread public acceptance of such reactors if there is seen to be political interference in the licensing process.

According to *The Independent* (14 January 2006) in addition to Government proposals to streamline major planning inquiries, senior nuclear industry figures also want to strip public inquiries of the power to investigate the safety of Britain’s new nuclear reactors.

The Sustainable Development Commission has warned that if the nuclear industry appears to lobby Government, public suspicion of the secrecy of the industry is raised.

*The Guardian* (21 January 2006) revealed through documents obtained under freedom of information laws that British Nuclear Fuels (BNFL) wants to restrict the scope of local planning inquiries. Instead it proposes effectively discussing issues such as safety, security and environmental impact behind closed doors. In the documents, BNFL warns that the only way to guarantee new power stations open on schedule is to fast-track the planning process by pre-licensing reactors before sites are selected.

The Health and Safety Executive has agreed to examine the scope for pre-licensing new reactor designs. This suggests that the Prime Minister’s decision as to whether or not new nuclear power stations should be “facilitated” has already been made.

Streamlining public inquiries, or doing away with them entirely (as was done for the English Advanced Gas-cooled Reactor programme) results in poor decision making. Avoiding discussion of nuclear safety in designs that omit safety features regarded as essential for Sizewell B will carry a heavy price. A backlash against top-down decision making will result from this approach.

**APPENDICES**


WANA Memorandum to the House of Commons Environmental Audit Committee Inquiry—13 September 2005.

14 March 2006

Witnesses: Mr Dylan Morgan, Secretary, *Pobl Atal Wylfa B*/People Against Wylfa B; and Mr Hugh Richards, Secretary, Welsh Anti Nuclear Alliance; gave evidence.

Chairman: (Through an Interpreter) A warm welcome to the Welsh Affairs Committee. I understand that Mr Dylan Morgan intends to provide his evidence in Welsh, and I welcome you.

Q526 Mrs James: My first question is to WANA, the Welsh Anti Nuclear Alliance. In your written evidence you use the term “umbrella organisation” for anti-nuclear organisations and groups in Wales. Could you give us an indication of the size of your organisation and how many groups and individuals you represent?

Mr Richards: We are lean and fit, I think you would describe us as. You can imagine that what has happened since 1980 is that the number of individuals actively affiliated goes up and down; it may be many thousands while there is a proposal to build a nuclear power station, such as Hinkley, it does not have to be in Wales. Basically, there is a core of organisations affiliated to WANA. These themselves can have numbers that vary; for instance, a constituency political party might be affiliated. We are non-party political but obviously each individual constituency might decide to affiliate, simply to get information from our newsletter. The old-fashioned paper mail-out is probably of the order of 150, something like that, but a larger number is e-mailed out to people who have expressed an interest in staying in touch over the years.

Q527 Chairman: (Through an Interpreter) Mr Morgan, could you tell us a little bit about the background of PAWB?

Mr Morgan: (Through an Interpreter) Thank you, Mr Chairman. PAWB was established in 1988, less than a year after CADNO was established in Trawsfynydd area, and both groups have co-operated closely over the years. PAWB was established, of course, in 1988 knowing that the old Central Electricity Board was presenting a bid for a second power station in Wylfa, in the same pattern exactly as they intended for Sizewell C and Hinkley C. It is fair to say that we had a very energetic campaign. We received financial support in 1989 to employ a part-time officer and practical financial and political support from Greenpeace. In 1988,
when we were established, we became part of the Anti Nuclear Alliance and we had a strong national campaign to object to the building of Wylfa B Power Station in 1989. Not only did we receive support from Wales but also from parts of England, especially north England, the Isle of Man, Scotland and Ireland, and I can also tell you today that many of those links are still in place. I am sure that you are aware that in the last few days there has been an increasing interest in the issue of the Government’s current energy review. There have been references in the newspapers recently regarding the Isle of Man, and Ireland is certainly taking great interest in the whole issue. One small point regarding numbers. I think our campaign in 1989 was the largest campaign against any request to build the nuclear power station. We passed every other local campaign; we collected over 50,000 objection cards. Those cards were sent to the old Energy Department, as it was, and Cecil Parkinson was the Minister. Many thousands of cards were also sent to the old Gwynedd County Council and the old Anglesey Borough Council, so it was a very powerful campaign with considerable support.

**Chairman:** (Through an Interpreter) Thank you.

**Q528 Albert Owen:** (Through an Interpreter) I would like to welcome you both and ask Mr Morgan how many members does PAWB have currently?

**Mr Morgan:** (Through an Interpreter) Currently, I would say we have about 300.

**Q529 Albert Owen:** (Through an Interpreter) Where are they?

**Mr Morgan:** (Through an Interpreter) Locally and in Anglesey and Gwynedd. Of course, radiation does not respect geographical boundaries and there is a lot of concern on the mainland, in Gwynedd, about the nuclear industry in general and therefore there has always been strong support in the north of Gwynedd for our campaign. As Hugh explained, back at the end of the eighties the figure was quite a lot higher, we are talking about 600 or 700, possibly.

**Q530 Albert Owen:** (Through an Interpreter) How many times do you meet in a year?

**Mr Morgan:** (Through an Interpreter) We meet regularly, at least once a month, but of course over the last few months we have been meeting more regularly and indeed we have been meeting quite regularly since 2002 when the first energy review was undertaken. It was a completely thorough review. Posing another question really, why is there a need for another energy review after the first energy review when the most thorough work on the whole issue of energy in Wales was carried out, the most thorough for many years?

**Q531 Albert Owen:** A question to Mr Richards. In your written evidence you say that it is the position of the Welsh Anti Nuclear Alliance that people still advocating nuclear power as a solution to global warming are deluded. On what basis do you make this claim?

**Mr Richards:** First of all, can I ask whether you have received “this” (*The Westinghouse Story*)?

**Q532 Albert Owen:** Only just.

**Mr Richards:** It does relate to the actual evidence which you had before. The evidence which I produced at the Sizewell Inquiry and subsequently at the Hinkley Inquiry has been brought up to date. The particular subject that I have honed in on is the history of Westinghouse reactors worldwide and their performance, because I thought it was important to understand why investments in Westinghouse reactors have ceased and many have been cancelled. To answer your question, what I am implying in that really is that we are looking at a historical phenomenon. The time when the standard approach to generating electricity for Britain was on a huge scale, where giant reactors were proposed to power an entire city, those days are passing; what is actually happening out there is that everything is getting smaller in scale. To give you an insight into what I am getting at, there were people who were saying, in the 1970s, all the computing power that Britain needed would be provided in perhaps a dozen large mainframe computers, situated in the business districts of cities. They did not foresee the advent of the micro-computer, the fact that everyone would have a personal computer; it happened very quickly. The same thing is about to happen with micro-generation and the point here is that generating electricity is relatively simple. If you have gas and oil piped to people’s homes and businesses and hospitals in order to heat the spaces in which they are, the way it is done at the moment sends most of the heat to waste from central-heating boilers. It is in tapping that waste through micro-generation, if you like, central-heating boilers which produce electricity.

**Q533 Albert Owen:** I am not disputing that micro-generation; certainly it is one way forward. The question, and really what I am trying to get out of you, is have I not known anybody saying that nuclear was the solution; what I have heard people saying, and I have been immersed in this debate for quite a long period of time, is that it is a part-solution. We heard the previous evidence session here today, and it is a mix that most people are talking about, not the complete solution. Do you not accept that, rather than being deluded, some people actually are looking at it afresh? There have been incidents, there has been evidence, and we have not had chance to read your paper because it arrived just today, but, for many people, and I was born and raised on Anglesey, as Mr Morgan knows, the views of the 1980s have changed perhaps, because of what has happened recently, i.e. the supply of gas, and that has concentrated the mind, also the North Sea reserves actually are lower, so they are looking at different solutions and nuclear is part of that solution. I think your broad statement about us, and I say that as somebody who thinks that it should be a rich mix, including nuclear, we are not so much deluded as looking at it afresh and looking at it being a level playing-field and open-minded?
Mr Richards: I am glad to hear that you are open-minded. I should say that I thank you for giving me the opportunity to put evidence before you and I am encouraged by your Committee taking evidence, because really that is what I think is needed, actually to get the evidence upon which to base policy and decisions. What we have been treated to over the last couple of years is a certain amount of enthusiasm for the idea of nuclear power stations being part of the mix, new nuclear power stations, but it has all been based on a rather vague proposal that more nuclear power stations are constructed. Part of what I wanted to bring to you, and what in fact we submitted to the energy review back in 2002, is that when you look more closely at the specifics of nuclear power then the misgivings that you might have felt can be balanced against the advances that you might see.

Q534 Albert Owen: I agree totally with that analogy, but there is also the other side to that, that people were kept in the dark about nuclear because there were strong campaigns and fear put into people; now that the evidence is on the table, many are more pragmatic and looking towards it. Would you not accept that?

Mr Richards: I would like all the evidence on nuclear power stations to be out in the open. I should say that I am an architect and a chartered town planner. I used to work in local government, for many years, and I am dismayed to read in the planning press that there are planning officers who are frightened at the moment about what is coming, if there is a nuclear programme, because of regulations which they perceive as hampering their ability to disseminate information on nuclear power stations because of the security of nuclear sites. That would put a planning officer in an impossible position, because he would be breaking other regulations if he did not disseminate information on a proposed nuclear power plant. I am on the side of openness.

Q535 Albert Owen: Absolutely, and you complimented me on being open-minded. I would suggest that you are rather closed on this issue. I respect your opinion fully and I have followed the debate and your contributions to it over many years. Planning officers are also very concerned about any form of energy generation that happens in their locality, it is a very technical issue for them, but do you not think that the mood of people in close proximity to power stations has changed, or has it always been broad?

Mr Richards: If there is to be support for a new generation of nuclear power stations, the rather general support that we have seen over the last few years, I would expect it to come from communities immediately surrounding the nuclear plants that derive some benefit from the employment at the plant. Of course there is a downside, there are quite depressed towns, like Leiston, in Suffolk, where the building of Sizewell B led to a bit of a downturn in the local economy as the construction workers moved away and the local firms could not compete with the salaries that were being paid at the station. I think that is less of a problem with the new stations because they will employ so few people.

Mr Morgan: (Through an Interpreter) Can I add there, Mr Chairman, that Amlwch is not strong economically, in spite of Wylfa’s presence.

Q536 David Davies: I just want to follow up Mr Owen’s questions a bit further. You can argue about specifics, as to whether Westinghouse is good or bad, as to what planning regulations need to be changed, of course all these things are up for debate, but what we are trying to get at is a basic principle here. I put it to you that nuclear power stations are up and running at the moment, they produce electricity, they do not produce any greenhouse gases, therefore if your main concern is climate change then it makes sense to incorporate them as part of your energy mix for future years, if you are concerned about climate change. Surely that is a fair point to make?

Mr Morgan: (Through an Interpreter) Perhaps you could describe nuclear energy as a comparatively low source, but the whole process of mining uranium to use in the power stations is all heavy on carbon dioxide use or release into the atmosphere, and when you end the cycle for decommissioning that is also heavy regarding carbon dioxide. If you take into consideration ten years from the building of a nuclear power station, much carbon dioxide is released into the atmosphere from that process, so you are incorrect to say that it is non-carbon.

Q537 David Davies: (Through an Interpreter) Yes, I have heard this before and you can make this point at any time of nuclear power, or any energy power, you could say something about windmills, you would have to release gases out of the air to build windmills. There is nothing in the world which is carbon neutral, but the process of creating energy in the nuclear power stations is carbon neutral, it does not emit any greenhouse gases at all?

Mr Morgan: (Through an Interpreter) It is carbon neutral but you have got the problem of the waste created and, according to what the Government itself has admitted, in the White Paper which was published in 2003, following the energy review in 2002, there is no answer to the problem.

Q538 David Davies: (Through an Interpreter) I do not accept the point, to be honest, but what about the principle; why cannot you see the point that it does not emit carbon dioxide and therefore it is better than many other energy sources?

Mr Morgan: (Through an Interpreter) There are too many of the negative things outweighing—ends with NOx (?).

Q539 Hywel Williams: (Through an Interpreter) On the principle of building new nuclear power stations, is there any objective research comparing how much carbon dioxide is generated or emitted when building such a power station, compared with, say, a collection of windmills or other sources, obtaining energy from the sea or any other methods? Are there any objective comparisons that have been made, in
terms of (how much) the whole process of building a nuclear power station, whatever we think about that?

**Mr Richards:** I think the most up-to-date information on that, and I would defer to them, is the Sustainable Development Commission, who have accepted nuclear power as a low-carbon source but, as Dylan has said, they find that outweighed by other disadvantages. They also add a rider to their deliberations, which is that, although nuclear power produces about one-twentieth of the carbon dioxide during construction and operation of a gas-fired power station, that does not include the burden for future generations of the fossil fuel that is required to store and to condition the waste and to decommission the stations. That, they admit, is an unknown; so there are unknowns which we are building up and handing on to future generations.

**Q540 Hywel Williams:** (Through an Interpreter) Are there objective figures then about the amount of carbon dioxide resulting from using coal-powered stations? Things we do not know about nuclear which is unfamiliar, regarding nuclear?

**Mr Richards:** Really I cannot add much to what I have just said. I would defer to others on this point.

**Q541 Nia Griffith:** Perhaps if we could ask you both what are the main advantages and disadvantages of nuclear power?

**Mr Richards:** I have admitted already that which the Sustainable Development Commission has admitted, that it can be considered to be a low-carbon source during operation. The problem is that a programme of nuclear power stations would take a long time to establish. It would have a divisive effect on the country because people are not in favour of nuclear power stations in general, they would prefer all other alternatives to meeting our carbon dioxide reduction targets to be looked at. Basically, it is slow and what we need is a fairly rapid response. Whether it is clean-coal technology, as you have heard this morning, whether it is renewables, my guess is, well, it is not a guess, I am speaking as an architect, the most rapid response is vastly more effort being put into energy efficiency. We are very, very profligate and the advantage of energy efficiency is that energy saved is money saved which can be reinvested into more carbon reduction means, such as carbon sequestration, or whatever, so it is a rapid, resilient response. Nuclear power, I am afraid, is hostage to events overseas. The continuity of will, both political and in the investment community, to see through a nuclear power programme would be enormous. Margaret Thatcher’s Cabinet committed the country to a programme of 1.5 gigawatts of nuclear capacity; that was reduced then to a small family of PWRs, one of which was to have been Wylfa B. Eventually that was whittled down to Sizewell B alone, for reasons to do with, I do not know, privatisation and the realisation that they could not actually sell a nuclear power station on the open market. We have seen programmes run into the ground, even with the most committed pro-nuclear Government that you could imagine. The time-frame is something like 15 to 20 years, during which we are going to have three or four Parliaments; in that construction period, it is possible that—it is a horrible thought but it is possible—there will be a terrorist attack on a nuclear power plant somewhere in the world. We hope to God it does not happen, but should it happen it will have an effect on the investors in a nuclear power programme. That is why the lower-tech, immediate, energy-efficient approach to meeting carbon reductions is more resilient.

**Q542 Mrs James:** (Through an Interpreter) This is a question for PAWB, Dylan. In your letter to the Committee, dated 9 March, you say, and I am going to quote here: “PAWB are opposed to any continuation of use of nuclear powered reactors and is opposed to any new nuclear power stations.” Can you tell us why, please?

**Mr Morgan:** (Through an Interpreter) I do not think it is just a matter of opposing a power station on Anglesey. Certainly we have made clear that we oppose it anywhere in Wales and the rest of the UK. The disadvantages are so great. In our written evidence to you, we draw attention not to the cost regarding decommissioning, I was talking to Hugh a few weeks ago and he was quoting me a figure from 1980, when the estimate of the cost of decommissioning and cleaning after the industry was 40 million. In the evidence which we have presented to you, the NDA, by 2001 that had increased actually to 40 billion; the NDA last year have acknowledged that the cost will increase to 56 billion, and recently the NDA acknowledged that this will increase to 70 billion. These are phenomenal figures and the costs are increasing minute by minute. Just another note which we have included, from Mark Williams, who I understand is a member of this Committee, although I have not seen him here this morning, in the Western Mail he was quoted as saying that the nuclear industry received £1 billion in research and development funding. I am sure that the NUM and colleagues from the Tower Colliery today would have been happy to receive a fair percentage of that research funding and I am sure that any renewable energy company would have been pleased to receive such support from the Government. I do not think there is a level playing-field and I do not think it exists now. A real level playing-field would ensure that much more financial resource would be provided for research into renewable energy. That is just one point. All the concern about accidents, we have always had that; perhaps it was easier for us to argue back in 1989 against building new nuclear power stations because it was so soon after the Chernobyl disaster in 1986, but you should all be aware that in a month we will be noting 20 years since the Chernobyl disaster. Last week, figures were released that 355 farms in the highlands of Wales are still under restrictions, 200,000 sheep are under restriction in Wales, England and Scotland, but in England and Scotland about 11 farms in England and nine farms in...
Scotland, so we have suffered substantially because of Chernobyl. The nuclear industry has to be unlucky only once anywhere in Europe to create an environment of disaster, as we saw in Chernobyl, and any such disaster, whether it were an accident within the power station or possibly a terrorist attack, would destroy the confidence of any investors in the industry.

Q543 Mrs James: (Through an Interpreter) BNFL have been here and provided evidence about the fact that they can deal much better now with the waste. Do you have any confidence in this?

Mr Morgan: (Through an Interpreter) No. There is a write-up I had seen last week from a magazine for engineers, New Civil Engineer, and that outlined the costs related to decommissioning and it was focusing on two pieces of the Sellafield work, B38 and B41. It was quite frightening the way they were finding problems as they went on, that the fact there was a lot more waste at the bottom of B38, for example, than they had imagined, and they are having to devise new systems on a regular basis to try to cope with these problems. That of course is reflected in the cost which the NDA are faced with; the cost is increasing all the time.

Q544 David Davies: (Through an Interpreter) Would you agree that the cost is more important than the effect on the climate? You have talked about the cost; the cost is not important, is it, what is important is ensuring that climate change does not take place? This is far more important than the cost of energy.

Mr Morgan: (Through an Interpreter) I agree with that, certainly, but I think that with the correct investment in the correct sources of energy there would be a lot better opportunity to reach the targets that this Government should be reaching. This comes back once again to the lack of a level playing-field and there is financial prejudice in favour of the nuclear industry which neglects other sources of energy.

Mr Richards: I would add to that, I think it is essential, whatever government is in power and whatever your policy aims are, the most cost-effective ways of supporting those policy aims are adopted. What worries me about the nuclear programme is that, although we have been assured that no public money will be used, the history tells us that there are many ways of getting hidden subsidies into the nuclear industry, such as insurance, that sort of thing, and the available capital that the country has, if it is put into nuclear power as a way of meeting our carbon reduction targets, will not go as far as it would if it went directly into energy-efficiency measures and micro-generation.

Q545 David Davies: Which brings me to my next question really, which technologies could we use to replace nuclear power, which currently accounts for about 20%. I think, of electricity generated?

Mr Richards: Most recently, the DTI put it at 19%, I think. First of all, let us look to, say, 50 years hence, when the Government wants really, really good reductions in carbon that we are producing. I think I would agree with Sir David King, the Government’s Chief Scientific Adviser, that where we want to end up is with an economy which is based and powered on renewable energy, and we have got to get there, and it does not matter where you are from, whether you are from Tower Colliery, or from us, or Sir David King, really we are all debating how we get to it. We are talking about a bridge. I will give you one insight, as an architect. The replacement cycle for central-heating boilers is 15 years; now I know that not everyone in 15 years is going to replace their central-heating boiler with one which generates electricity from the waste heat, but over three cycles, up to the year 2050, I think it is entirely possible that we will see a shift very much in that direction.

Q546 David Davies: That is all well and good, but it is not going to plug the gap, is it? Where are you going to plug the gap in not just 50 years but in five years’ time, when those nuclear power stations have been shut down and you have got to find that 20%? From where is that 20% going to come?

Mr Richards: I think that we are going to have to concentrate on fossil-fuel-burning but very much more efficiently; combined heat and power stations on the larger scale. If you look at the demand centre for the growth of electricity in Britain, for many, many decades it has been Slough. Poor old Slough; no-one is going to suggest that you build a nuclear power station there, although that might be a good test of public acceptability.

David Davies: I think you are being very honest, I have to say, but you have almost answered my next question.

Chairman: There is a question which Mr Albert Owen wants to ask.

Q547 Albert Owen: I am very interested in what Mr Richards said about hostages to fortune overseas, I think that was your sort of terminology, and also what Mr Morgan said about the waste legacy. Actually I accept exactly what both of you were saying, there is a huge mess that is the waste legacy. What I am trying to fathom out is why countries like Finland, which are seen as environmentally-friendly, have decided that the new generation is going to be an improvement. They had an open debate, they brought in the environmentalists, who contributed to that debate, and how to deal with the waste. In this forum, in which we are having a review now, I think that is the way forward. I accept totally that it has been a mess and previous governments have not handled the waste issue well but I do not see that necessarily the future will be the same. Do you not accept that?

Mr Richards: I will tell you what I will accept. It is not the case, but if you were to go down the pro-nuclear route, you wanted to consider seriously a new nuclear power programme in Britain, the smart thing to do would be to watch what happens in Finland. What has happened so far is that a commitment has been made to build a fifth reactor; it is of a type that is called the EPWR, the European
pressurised water reactor. Interestingly, the Westinghouse design was rejected as being not aircraft-proof; the EPWR was thought to be somewhat more robust. It has been suggested to me by a nuclear inspector, obviously whom I cannot name, that part of the reason why the French and the Germans have heavily subsidised this reactor, which is of an untried type, is that they wanted it built in Finland.

Mr Richards: I have to say, I may be anti-nuclear in my sentiments but I have great respect for the Health and Safety Executive and the Nuclear Installations Inspectorate, as long as they stay truly independent from political interference. What terrifies me about the call that the HSE conduct pre-licensing, or consider pre-licensing, of nuclear, amongst other energy forms, is that, as a retired mines inspector, an HSE inspector told me at the weekend, one interpretation of that is that you do not need a Nuclear Installations Inspectorate, you simply pre-license it and that is the end of it, you do not need an Inspectorate. The reason you need an Inspectorate, in my opinion, completely free from political interference, is that they apply stringent safety principles to the operation of nuclear power stations in Britain. My interpretation of those safety assessment principles is that the designs being proposed currently would not get a licence.

Q550 Mr Martyn Jones: A question to both of you. Should the Government's energy review conclude in the energy review, then India, China and other favouring of nuclear power, which would be the 'lesser evil', in your view; would it be the extension of the life of the current Wylfa Magnox plant, a new-build on that site or another plant, somewhere else in Wales?

Mr Richards: I agree, to this extent. It is perfectly true that there have been missed opportunities in clean-coal technology and carbon sequestration, that sort of thing. What I am saying really, with this chart, is that, with the nuclear power industry, they also have had a hiatus, a gap, in their development; it has lasted for 33 years. Westinghouse have not had an order that has survived cancellation in the USA, its country of origin, for a third of a century. What it means is that they are starting over again; they are starting with a design that is 18 years old, the AP600. Congress withdrew support from it in 1997 because they saw that there was no prospect for its commercial adoption, they went on then to the AP1000, which increased the output, to try to regain economies of scale. They have been developing this design as a concept over the years; it has not been built or tested anywhere. They could have applied for a licence in this country years ago. Dylan and I challenged them to apply for a licence a year ago, together with Greenpeace, and they did not apply for a licence; so it is a bit rich when now they come and say, “Oh, it’s all a bit of a rush, we’ve got to rush this thing through.” No.

Q549 Mr Martyn Jones: In your written evidence, Mr Richards, you outline concerns about the effects of pre-licensing new reactor designs. Can you tell us what the current re-licensing process is, in the UK, and how it could be improved in order to address some of the concerns that you have?
I have great respect for, have put it on an annual review basis, they want to see data on the state of the graphite every year and it operates for about 12 months at a time. That is the reality, and talk of it being extended is beside the point. Everything should be based on its safe operation.

Q551 Mr Martyn Jones: With all due respect, none of you has given an answer to what I asked; which is the lesser evil of those three options?

Mr Richards: Yes, you did give three options. I can honestly say that building a nuclear power station anywhere in Wales will make matters worse, in terms of the Government’s objectives for carbon reduction. It will be worse during the construction period, there will be a carbon debt, if you like, of that construction carbon dioxide that it has to clear. Admittedly, during operation, it will have some benefits, in terms of carbon reduction, but then there is the nuclear waste issue. That does not even address the fact that if lower-quality uranium fuel has to be used within the lifetime of the reactor, which I see that the nuclear industry projects as 60 years, and it is quite likely that within 60 years poorer-quality uranium fuel will have to be used, then the carbon reduction advantages are reduced greatly and might be reduced completely. I think it would make matters worse. In terms of building a nuclear power station as a replacement for Wylfa B, I am afraid that we are already past the point where there can be a continuity of employment on that site, except, that is, for the employment that will be increased probably during the decommissioning, if decommissioning takes place relatively promptly and is not put off for 100 years.

Q552 Albert Owen: I just wanted to take the points you made about the graphite cores. The NII has also said that Wylfa, or the Magnox one, is in the best condition, otherwise they would not have given it a licence, so I think we need to put that on the record. When there was closure in 2000–01, when it reopened the NII gave it a clean bill of health; so you are referring to a period of 1991, actually it was given a clean bill of health in 2001. Although there is ongoing monitoring, it has a licence to 2010. I think it is fair to put that on the record, because obviously it is important to people in the area as well as people who are anti-nuclear outside, that it is a safe operation at this moment otherwise it would not have got its licence. With the extension, again, just to correct Mr Morgan, it is not simply that Springfield is closing down, Springfield can remain open; the issue is Sellafield and the B205. The issue that the DTI have said to this Committee, in a written response, it is the cost element which is the biggest challenge as well as any safety issue, it is cost on which they will take their decision because it is the only Magnox station there is carrying on, so that is the reason for it, but those costs are being looked at with regard to that. The final issue I wanted to mention was that you have confidence in the NII, as you said, and you respect them, so do you not respect that decision, Mr Richards, that it is operating safely at this moment in time?

Mr Richards: Yes, I do respect them, but they evaluate the data that is put forward by the operator of the Wylfa station and my problem with that is that you cannot have full knowledge of the way in which the graphite has deteriorated within all of the core, you can only sample it. If you like, the degree of confidence is decreasing, the safety margin is decreasing, the volume; it is like osteoporosis, the graphite gets eroded by the nuclear fission in the reactor and it loses its volume. If I were an architect seriously going to a building inspection, saying, “The central part of this building, which supports thousands of tonnes of weight above it, has lost up to half its volume,” I would be very worried. What I am saying is there are life-limiting components; the life-limiting component in Wylfa is the graphite and that is why the data that is received every year is vital. I am worried that the NII are not getting sufficient data; that is my concern.

Q553 Albert Owen: You are not suggesting that the HSE, NII or indeed the workforce there are cutting corners?

Mr Richards: No, but I will tell you something that I have discovered over the last few years. The samples of graphite which are taken for analysis go off the site; there is a time delay between the analysis of that graphite and the results being returned to Wylfa and to the NII to interpret. What worries me is that the time delay means that quite serious depletion of graphite in certain key components might have occurred and gone off the site.

Albert Owen: They are looked at before they go off site as well, they are monitored, so it is not simply as you say.

Q554 Hywel Williams: (Through an Interpreter) Can I just turn to this issue of cost. The BNFL say that the cost of producing electricity through nuclear methods is 2.3 pence per kWh; that is the cost they specify. How do these compare with the figures that you have got?

Mr Richards: This graph, which I have put in front of you, tells you about the actual performance of Westinghouse PWRs worldwide; it includes Sizewell B. Sizewell B, as you know, is producing electricity at round about six pence per unit. That is partly because all the costs of the PWR programme were loaded onto Sizewell B because it turns out to be the only one. What that diagram shows, the yellow column shows what the BNFL currently, or what they said to the energy review back in 2002 was, that ties in with the cost figure that you just quoted, that it is based on 90% load factor, it is available for 90% of the time. My analysis of all Westinghouse PWRs worldwide, all of them, is that overall, from the scheduled date that they started at, they have produced about 58% load factor, and from the date they actually started up, in other words, disregarding the construction delays, 73%. Really what I am saying to you is if we go down the nuclear route it will be the triumph of hope over experience.
Q555 Hywel Williams: (Through an Interpreter) Can I therefore ask whether any sensible investor, in your opinion, would be willing to invest in the nuclear industry if there were no hidden sponsorship or obvious sponsorship from the Government and from other methods? If anybody looked at it like a commercial decision, as was made during Mrs Thatcher's Government, if one looked at it objectively as a commercial investment, would any investor continue with a nuclear power station, in your opinion?

Mr Morgan: (Through an Interpreter) I am doubtful. Toshiba recently has bought Westinghouse. American branch of BNFL primarily is not only a commercial one but also has a substantially political element to it and that, ultimately, either the questions relating to carbon dioxide, neither those questions or the commercial questions count fully in the decisions, a case of political power and decision?

Mr Richards: You are absolutely correct in your analysis. It was almost word for word what the first energy review concluded. I have had it verbatim from Gordon McKerron that no private finance, purely private finance, of a new nuclear power station has occurred for many, many decades. Where nuclear power stations are being built, they are being subsidised one way or another, whether it is by the state or, as in the case of Finland, as a loss-leader by the manufacturers.

Q556 Hywel Williams: (Through an Interpreter) A question for Mr Morgan. You have mentioned three incidents when risk of a major accident occurred in Anglesey. Can you provide more information about what happened?

Mr Morgan: (Through an Interpreter) In 1993, of course, that was the most serious incident and we have outlined in our written evidence to you what happened on that day. This grab, which was quite heavy, broke free at the joint and fell into Reactor One in Wylfa. What is terrifying about this incident is that this bit of machinery had been inside the reactor for nine whole hours. The nuclear power station workers knew that there was a part there which should not have been there; why did it take nine hours for them to shut down the power station? Magnox Electric, I think it was, at the time, was prosecuted in Amlwch Magistrates' Court, following that incident, so it was a matter of great concern for us in North Wales that this set of incidents could happen. Of course, the Health and Safety Executive, on behalf of the NII, went on to prosecute because of this incident and there was a case in Mold Crown Court in 1994, where the operators of Wylfa were fined £2 million and costs were awarded against them of another £2 million. The evidence of one of the NII people in the Crown Court in Mold was that it was a matter of luck, rather than design, that the grab had stopped where it had stopped, about ten inches away from the fuel element in the fuel channel. Before that, of course, there was the issue of rainwater going into the dry storage in Wylfa Number Four. Do you know what caused that rainwater to seep in? Apparently it was birds nesting on the roof and that was what caused the rainwater to seep in. We outline there, of course, that the uranium metal corroded and created a great danger of fire, and that involved releasing radiation into the atmosphere. These are not minor incidents, they do frighten people.

Q557 Nia Griffith: (Through an Interpreter) A question for Mr Morgan. You have mentioned three incidents when risk of a major accident occurred in Anglesey. Can you provide more information about what happened?

Mr Morgan: (Through an Interpreter) A question for Mr Morgan. You have mentioned three incidents when risk of a major accident occurred in Anglesey. Can you provide more information about what happened?

Mr Morgan: (Through an Interpreter) In 1993, of course, that was the most serious incident and we have outlined in our written evidence to you what happened on that day. This grab, which was quite heavy, broke free at the joint and fell into Reactor One in Wylfa. What is terrifying about this incident is that this bit of machinery had been inside the reactor for nine whole hours. The nuclear power station workers knew that there was a part there which should not have been there; why did it take nine hours for them to shut down the power station? Magnox Electric, I think it was, at the time, was prosecuted in Amlwch Magistrates' Court, following that incident, so it was a matter of great concern for us in North Wales that this set of incidents could happen. Of course, the Health and Safety Executive, on behalf of the NII, went on to prosecute because of this incident and there was a case in Mold Crown Court in 1994, where the operators of Wylfa were fined £2 million and costs were awarded against them of another £2 million. The evidence of one of the NII people in the Crown Court in Mold was that it was a matter of luck, rather than design, that the grab had stopped where it had stopped, about ten inches away from the fuel element in the fuel channel. Before that, of course, there was the issue of rainwater going into the dry storage in Wylfa Number Four. Do you know what caused that rainwater to seep in? Apparently it was birds nesting on the roof and that was what caused the rainwater to seep in. We outline there, of course, that the uranium metal corroded and created a great danger of fire, and that involved releasing radiation into the atmosphere. These are not minor incidents, they do frighten people.

Q558 Albert Owen: You are quite right to suggest that the NII inspector has said it was a matter of luck, but others had said it was a proactive shutdown.

Mr Morgan: (Through an Interpreter) After nine hours; why not after an hour?

Q559 Albert Owen: It was a proactive shutdown and they closed the two of them down; that is what happened. I think this proves that the safety built into nuclear power stations actually works, because nobody was hurt in this incident but it was contained. Yes, the NII fined it, for a breach, for not having a spare on site, was one of the reasons they were fined actually, not because of the incident itself. The Health and Safety said, “You have to have a back-up to this.” I think it is important to say that. Also in your evidence you suggest, Mr Morgan, and I think Mr Richards as well, about the costs of when
Mr Dylan Morgan and Mr Hugh Richards

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the Anglesey Aluminium cannot get the supply, and of course it did close down for two and a half years, but then the inspector said it was safe to go on. The reason it took the length of time it did, and do not accept this, because I am here to ask questions as much as to give opinions, is that it found that there was a crack in one of the steam-rails on one pipe and that, because of precaution, proactive action had to be taken on the others. That was why it took 18 months, that it could have been done very quickly but, because of the overreactive nature of the industry, it took that length of time. (Through an Interpreter) Is that true?

Mr Morgan: (Through an Interpreter) It is quite possible it is true, yes, but they were correct in taking the time that they took to make sure that all the pipework was safe, in their opinion.

Q560 Albert Owen: I am addressing this to both of you. Is it not a fact that the NII and the inspectors in HSE and the safety on site actually is working, because you are talking about near catastrophes; there has not been a catastrophe in Wylfa for its whole lifetime of 30-odd years, neither in Trawsfynydd? What I am saying to you is, those incidents did happen, they were corrected, but in the future, and this is why we are having this review, those incidents are unlikely to occur because we are moving on to new technology. That is my point.

Mr Richards: Thank you for giving me the opportunity to mention the new technology.

Q561 Albert Owen: You have done, in great detail, with respect. We have a difference of opinion on it. Mr Richards: Thank you again. It has been said that the new technology coming up will be safer than the existing stations. Put the existing stations to one side. Where is the evidence, I would suggest, that you ask, where is the evidence for saying that the new designs are safer? The truthful answer is, we simply do not know; there may be, there may not be, we do not know because they have not been built or tested anywhere in the world. That is what I mean to say about the gap. There has been a nuclear power industry worldwide, it has stopped, it has come to a halt and now they are trying to restart it with new concept designs on the basis that they are safer. Unfortunately, we just do not know. There was a proposal after the Chernobyl accident that something called an “inherently safe reactor” be built. The nuclear industry looked quite hard at this. The idea of the inherently safe reactor, as far as we are concerned in Britain, is that it might have been possible for the current safety assessment principles to be set to one side, because the idea was that, no matter what happened in this reactor, it could not explode, radioactivity could not escape; that was the idea of the inherently safe reactor. It was abandoned by the nuclear industry, it was abandoned because they were scared of promoting because people would say then, “Well, if this is the inherently safe reactor, does this mean all the existing reactors are inherently unsafe?” So they dropped it and instead they adopted some of the features, called “passive safety features”, some of them, not all of them, and put them into their new designs, which is what we have got now, we have got some designs, concepts, with some passive safety features, but we do not know if they work.

Q562 Albert Owen: Just to move on, you are very honest and open with your answers and I do accept what you are saying with regard to why they were abandoned, because of the effect they might have on the nuclear industry and other reactors. Coming locally, and again I am asking both of you, for an obvious reason, because we have a local dimension, from Mr Morgan, but we have a wider dimension from yourself, how could you replace the jobs lost on Anglesey, with regard to the direct closure and possible closure of the aluminium works at Penrhos, should the nuclear power on the island come to an end in 2010? The second question I think you can link in because we have touched on it. British Nuclear Fuels told this Committee that nuclear power is subject to a sort of inverse NIMBYism, ie it is popular round the areas, whereas in any other planning application people tend to oppose it because they do not want it in their backyard. First from a non-Anglesey perspective?

Mr Richards: This is something I do have an insight into because I worked in local government for several years in economic development. First of all, I would say, the closure date for Wylfa has been known about for a long time. The terms of the contract for cheap electricity between the operators and Anglesey Aluminium have been in place for a long time. The need to find replacement electricity has been known about for a long time. If I had been asked for my input into that situation to the local authority, I would have said, “You’ve got plenty of time to plan for what is going to happen.” On the positive side, at the station itself you happen to have the best possible experts for the decommissioning, they know the plant better than anyone else and therefore I would look to continuity of employment for at least 20 or 30 years after the station closes. I was talking to someone from Bradwell. I was talking about Trawsfynydd, they were talking about Bradwell. Trawsfynydd had shut and Bradwell was still going. They told me about the run-down of employment, the way it had been scaled back over the years while it was still operating, and I said, “That’s exactly the same profile of employment reduction that’s taking place at Trawsfynydd after it’s shut.” In other words, there is a general run-down in employment on nuclear sites. It is known, it is a knowable, so, as an economic development officer, I would say let us look at the plus side.

Q563 Albert Owen: People are doing that. I linked the Anglesey Aluminium works deliberately because they were both built almost side by side and there was a baseload down to the aluminium works when Wylfa was planned and opened. The question I am asking is how are you going to replace those jobs? Again, the timetable was known since 2000 for 2010, but at that time they were also talking about 2021 with regard to magnox as an alternative, it is just that the Government turned its back on that because
of costs and different issues. To be fair to Anglesey Aluminium, they have gone down that road, they have commissioned a report, it is just that the price of gas has gone so high that nobody will commission a station at this moment in time. When their contract ends, in 2009, they are looking for an alternative supply; they take 37% of their cost to be electricity, so that has gone up by another 30% to 40%, so they are in an economic situation now which is not of their doing. Again, I agree with Mr Morgan, they do look at, say, 2009, where the price might change substantially because of the connector coming from Norway. They cannot risk that, because in 2009 their contract ends and the gas comes on roughly at the same time, but in the meantime they need to build a station. Economically they cannot do that now for gas. That is why it is a unique situation. Really my question is, two of them and you have not answered either, how do you think they can fill those, because we are talking about £47 million into the local economy and nobody has been able to come up with an answer, and I think economics are important, as is safety and other things that we have mentioned?

**Mr Richards:** Given that they have got to make an investment, if they are to stay on the island, they have got to make an investment in some new supply. All I would suggest to them is that they try to form a consortium with industries of the local area and see if it is possible to do a combined heat and power plant, the most efficient plant possible.

**Q564 Albert Owen:** They have looked at other options and what they are telling us locally, me, as a local MP, and the local economy, is that an extension to Wylfa will give them breathing space. They raised that issue and that is why locally they are together. Can you deal with the inverse NIMBYism which occurs around areas where the local economy has been reliant as regards GDP and wages? Anglesey Aluminium has wages 65% higher than the average, on Anglesey, and Wylfa some 40% higher than the average wage. Can you understand, Mr Morgan; from your perspective, can you talk about inverse NIMBYism?

**Mr Richards:** All I would say is that, yes, it is obvious that there is going to be some support for nuclear power from an area that has derived benefits directly from it; yes, why would I deny that? Also, I would say there is a downside, which is that other local firms cannot compete with those sorts of wages, therefore there may be a bounce-back once those wages are taken away. I am saying that.

**Q565 Albert Owen:** You say the nuclear industry is based on hope. I think that is a high hope as well.

**Mr Morgan:** (Through an Interpreter) A discussion has started in the past few weeks locally about other sources of energy. The information which I have received recently about the Pelamis wave energy converter, there is a company in Scotland which is called Ocean Power Delivery which is looking at, well, they are trialling these things at the moment. The tragedy really is that Portugal is at the forefront with these trials. There are some trials in Cornwall and Scotland, but this company has identified the coastline in the south-west of Anglesey as an area of great potential, and, although Ireland shadows Anglesey from the Irish Sea, it does not quite do so, there are strong waves coming in to Anglesey. I have got figures here about these inventions and that 40 Pelamis instruments, inventions, could produce 30 megawatts of electricity, so 340 of them in nine square kilometres could produce 270 megawatts and much more than the 250 megawatts which Anglesey Aluminium wants.

**Q566 Albert Owen:** (Through an Interpreter) I agree with that. There is potential in the sea and in all sorts of other energy sources, but how would you fill this gap, if Anglesey Aluminium were to close, and we are talking about large salaries?

**Mr Morgan:** (Through an Interpreter) The gap will exist anyway, will it not, because if you had permission yesterday to build nuclear power stations, it would take some time to build them and it would be closer to 2020 being completed.

**Q567 Hywel Williams:** (Through an Interpreter) Can we turn to the question of terrorism, which gets a lot of attention because of the danger of being vulnerable to attacks. We have had evidence from the Electric Power Research Institution in the United States which says that there will be no radiation being released if any kind of aircraft were to strike a nuclear station. They have looked at these possibilities and they say that, the picture that one has of the aircraft striking into one of the twin towers, if it did so in Wylfa then no radiation would be released. What is your response to that and the response in general to the question of terrorism?

**Mr Richards:** I have got a paper in front of me here from an independent nuclear expert, John Large, but he is quoting the British situation. The background is we live on a small, overcrowded island, between two huge continents. We have thousands of flights over us every day. The acceptable risk of an aircraft flying into a nuclear power station, regardless of terrorism, the basis on which our present nuclear power stations were built and planned, is that the chance of a direct hit from a big aircraft would be one in 70 million, which is something we live with because it is so incredible that you do not actually have to go down that route and do too much planning, or, at least, that has been the view of the Health and Safety Executive. As you say, that has been replaced with the rather more daunting possibility that a plane might be flown directly into a reactor. I have here the calculations made in Britain about aircraft flying into a nuclear power plant; there are two exceptions that they do not worry about. They do not worry about military aircraft, because they think that the pilot, no matter what trouble he is in, will make the adjustment and avoid it, sacrifice his life. The other exception that is made in Britain to an aircraft strike is aircraft with a mass of less than 2.3 tonnes. Between 2.3 tonnes and a wide-bodied jet, the biggest that is around, there is quite a bit of scope, and so I would not put too much credence on American research that is theoretical.
What we have is 'planes taking off all over Europe, the average, say, Schiphol, Amsterdam; by the time that one of those 'planes gets over Wylfa it has still got 160 tonnes of kerosene on it. I am not an engineer, he is; he is saying that this is not being planned for. As I said earlier, I did ask the nuclear industry proponents, one month after 9/11, and I said, “What would you do, would you put them underground, would you build bigger containments around them, or thicker concrete?” and he said, “Where there’s a will there’s a way.” It has not been thought through. I do not think that any of the implications of this nuclear power programme have been thought through, it is all a kind of generalised chorus in the background, and when it gets down to the actual nitty-gritty it will fall apart.

**Q568 Hywel Williams:** (Through an Interpreter) Can I turn to a key question, in my opinion, the alleged link between nuclear power and nuclear weapons. I say “alleged” because I happen to believe in it myself, but that is a matter of another argument. The evidence which has been presented to us is, whatever you allege about the link between the nuclear industry and nuclear weapons, these days the techniques and the methods out there and the materials already out there to set up power stations will not have any impact. As someone told us, the genie is already out of the bottle, as it were. How do you respond to that sort of argument?

**Mr Morgan:** (Through an Interpreter) The Government itself accepts that (Not Through an Interpreter) “current nuclear designs operated within an effective security and safeguard framework, such as the UK’s, should create very little risk of proliferation.” (Through an Interpreter) They do not say that there is no risk at all and therefore out attitude is however much of this material is available the greater the chance for it to fall into the wrong hands. To go back to the issue of terrorism, we have received information recently there is a lot of hypothesising about the ‘plane that came down in Pennsylvania on 11 September. One theory was that apparently the Chechhnays were planning to crash a ‘plane into a reactor in Russia. They found out in time that this ploy was being organised and it was prevented; but also reports that detailed plans have been found in a vehicle belonging to one of the suicide bombers in London last summer containing detailed maps of nuclear sites in Britain, including Sizewell.

**Q569 Hywel Williams:** (Through an Interpreter) presented the argument, and I think it is a very good one, that the nuclear industry is open to one, large disaster which will change the climate regarding confidence in the industry and the economic climate as well. Even if an aeroplane were to strike Wylfa and it did not lead to the release of radiation, what do you think that would do to the confidence of the Government, the public or the commercial side; what would be the effect on the nuclear industry?

**Mr Morgan:** (Through an Interpreter) I think, as I said earlier, that it would demolish the confidence of the public and also the confidence of companies.
will monitor it.” What is the point of putting it deep underground and monitoring it if you cannot do anything about it? So that is where we are up to; so I have grave misgivings.

Q571 Mrs James: The point you are making is that it can be monitored but if something goes wrong we will not know how to deal with it?

Mr Richards: Exactly.

Mr Morgan: (Through an Interpreter) Can I just add then, of course you are aware that CoRWM will produce a report in the summer this year and Gordon McKerron, the Chair, has said, the Scottish Parliament has said, that they have made perfectly clear that they would not be too happy to see new nuclear power stations on their land, unless the nuclear waste problem is to be solved, and it does not look likely that this body under the sponsorship of the Government has found a final solution to the problem. Can I just refer also to one piece of our evidence where we refer to burying deeply in the ground and the point which was made was that even at three and a half kilometres under the ground, even in such depth, the microbes still exist, water exists, so things are not stable. That is part of the biosphere, in the same way as above the ground is part of the biosphere. Another point which we made in our evidence was that in Snowdonia the rocks are very old, but yet again in 1984 we had the strongest earthquake that we had had for many, many years, so the earth’s crust is not stable. So the whole question of burial, there are so many problems involved with this, and is it possible to have a final solution. I am very doubtful.

Chairman: (Through an Interpreter) Thank you very much for your evidence and your very full evidence. If you wanted to provide additional evidence to us, we would be very grateful. (In English) Thank you very much for your evidence and if you wished to add anything further, we would be very pleased to receive it.

Supplementary Memorandum submitted by Dylan Morgan, Secretary, PAWB

The question we didn’t have time to discuss during our evidence session to the Welsh Affairs Committee on March 21 was the working relationship between the DTI and the National Assembly. On behalf of PAWB I would like to make the following comments.

In our submission to the 2002 Energy Review, we argued that decisions on planning applications in Wales for power generation projects over 50MW should be devolved to the National Assembly. What is the point for the Assembly to publish an Energy Route Map for Wales without having the powers to decide on 50MW+ power generating projects.

We therefore repeat this argument for the 2006 review.

Furthermore, the Assembly government sees no need for new nuclear power generation in Wales, a view shared by the Secretary of State for Wales, Peter Hain.

Should the DTI decide in favour of a new generation of nuclear power stations, no such stations should be forced by London diktat upon the people of Wales.

15 January 2006
Tuesday 28 March 2006

Members present:

Dr Hywel Francis, in the Chair

Nia Griffith
Mrs Siân C. James
Mr David Jones
Mark Williams

Written Evidence from Dr Ian Masters, Lecturer, University of Wales Swansea
Responsible for Marine Energy, Welsh Energy Research Centre

SUMMARY

The UK Government should invest the value of one fossil fuel power station (£500 million) over the next five years to build a Marine Energy industry in the UK to export to a potential £115–£444 billion world market.

TIDAL STREAM

The idea of harnessing tidal streams relies on the same principles as a wind-turbine, in that a rotor spins to generate electricity.

However, instead of wind driving the rotor, a tidal stream turbine uses water. Fast flowing water is found in rivers, estuaries and tidal flows and its energy can be converted by the turbine into electricity to power factories and homes.

The long-term world market for tidal stream power generation is estimated between £115 and £444 billion. Currently, only 1.5MWe is in the water with forecast installation of 65MWe by 2010.

The UK tidal market has been estimated by the Carbon Trust in its final report to the “Marine Renewable Energy Challenge” as worth £4 billion, providing about 3% of the UK capacity or 2.5GWe. The report also suggests that with significant economies of scale, the technology can be cost competitive with fossil fuel generation.

This is a new high value, high tech, export market that Wales should strongly support. UK companies currently lead the field, including Swanturbines Ltd. a spinout company from Swansea University with technology developed in Wales to exploit this opportunity.

WAVE POWER

Wave energy has the potential to be as large an industry as Tidal Stream and the West Wales coastline has a good wave climate. The recent announcement that WaveDragon intend to deploy off Milford Haven is a very positive step forward. Swansea University are partners in a European Framework 6 project with the company.

THE SEVERN BARRAGE

I have not studied this technology in detail and therefore do not have a view on the suitability of this project.

TIDAL LAGOONS (SPECIFICALLY IN SWANSEA BAY)

All the information available on this project is based on a single (unpublished) report commissioned by the company. However, a recent South Wales Evening Post article stated that the capital cost would be £80 million and it would power 40,000 homes. However, there is “significant uncertainty about the costs” (Ofgem, 2005). For comparison, a £23 million onshore wind farm will power 20,000 homes.

There are three major unanswered questions with this technology:

1. The operational life of turbines in a flow regime with significant suspended solids.
2. The effect of silt build up within the lagoon.
3. Environmental impact of the scheme.
THE WELSH ADVANTAGE

1. There is a significant natural resource close to good grid connections.
2. WAG/WDA and the universities are engaged with device developers with track record in this area including Wavedragon, Marine Current Turbines and Swanturbines.
3. Fabrication, heavy industry and electronics companies exist to create a supply chain for the sector.
4. There is a good network of ports and marine facilities.
5. Good marine environmental expertise, within the universities and Welsh SMEs.
6. Opportunity to use skills from the aero/auto sectors for design innovation, lean manufacturing and reduced time to market.

REQUIREMENTS FOR GOVERNMENT SUPPORT

There needs to be a significant number of devices purchased and installed within the next five years or the industry will run out of support from investors. The consequence will be investment in other energy technologies where the expertise probably does not reside in Wales or even the UK (eg wind, gas, nuclear). A multi-billion pound opportunity will have been lost. Therefore, in order of priority, the industry requires:

1. Development sites offshore in which to deploy pre-commercial devices.
2. A long term commitment to a premium above ROCs for marine devices.
3. Significant funding for research and development to address the general issues of environmental impact and achieve the innovative step change in technology required to reduce costs. Current support of £50-100 million is probably about 10% of that required if the UK is to retain the lead in this industry.

22 March 2006

Written Evidence from Peter W Ullman, Chairman, Tidal Electric Limited

I welcome the opportunity to offer evidence to the Committee and laud its timely interest in energy in Wales. Skyrocketing gas prices, climate change worries, fuel poverty, questions about emissions targets, and now the nuclear debate make energy a focal concern for government and a major worry to the public.

INTRODUCTION

(a) Tidal Electric Limited is a British company founded in 2001 for the purpose of commercialising the “tidal lagoon”¹ form of tidal power technology.

(b) Tidal Electric Limited holds the rights to UK Patent No 0749529.

(c) Peter W Ullman is Chairman of Tidal Electric Limited as well as the inventor cited in the above patent.

TIDAL LAGOON TECHNOLOGY²

(d) Offshore tidal lagoon power generation utilises the vast potential of the ocean’s tides. Using an offshore impoundment structure built of rubble mound construction materials (loose rock, sand, and gravel) sited in a shallow tidal flat with a large tidal range, predictable and sustainable electricity can be generated by the rise and fall of the tides. It is not directly comparable to a tidal barrage scheme³ (such as the Severn Barrage) as the power is generated offshore via the impoundment structure. None of the shortcomings of the barrage (massive environmental impact, blocking navigation, impeding fish migration, changing the tidal regime, high cost of electricity, one-way generation) plague the tidal lagoon. The tidal lagoon scheme enables tidal energy to become a mainstream technology choice.

(e) Tidal lagoons are not tidal stream devices. Tidal stream devices are in their early stage experimental phase of development. OFGEM estimates that tidal stream power costs more than three times the cost of tidal lagoon power. Offshore tidal power generators use familiar and reliable low-head hydroelectric generating equipment, conventional marine construction techniques, and standard power transmission methods. There are 450,000 such low-head generating units functioning in conventional hydroelectric applications world-wide.

¹ “Tidal lagoon” is the informal term for the offshore tidal impoundment generation technology developed by Tidal Electric. Friends of the Earth’s Neil Crompton coined the term and it has gained wide usage.

² Please see Appendix 1 “Briefing” for a more complete explanation.

³ Friends of the Earth has produced a comparative analysis of lagoons vs barrages. Please see Appendix 2.
The optimal site for offshore tidal power generation is the shallow water of near-shore areas, away from major shipping lanes that require deeper water. The offshore siting is the distinctive characteristic of the design and one of the fundamental claims of its patents. Turbines are situated in a powerhouse that is contained in the impoundment structure and is always underwater. Power is transmitted to shore via underground/underwater cables and connected to the grid. The structure need not be more than a few yards beyond the extreme low tide level and the optimal site is one that is as shallow as possible, thereby minimising the height and hence the cost of building the impoundment wall.

The impoundment wall structure is a conventional rubble mound breakwater, with ordinary performance specifications and is built from the most economical materials. In the event of a failure of the structure, the consequences do not include safety issues or nearby property damage. The most likely cause of a failure would be a strong local earthquake (unlikely in UK waters) and the most likely type of damage would be a breach of the impoundment structure. Thus, the principle consequence of failure would be economic (temporary interruption of service) and, therefore, economics are the primary driver in choosing the materials and the construction method.

There are numerous potential sites in UK waters, but two have been identified as suitable for the construction of the world’s first tidal lagoon generation scheme: Swansea Bay and the North Wales coastline, off Rhyl. Both areas have high tidal ranges and relatively shallow waters. Feasibility work started in 1999 and preliminary consultation with local planning authorities has been undertaken. There has generally been a favourable response to the proposed schemes as they provide a sizeable renewable and predictable generation resource. Swansea Bay has a capacity of 60MW and North Wales has a capacity of 432MW.

There are a number of other potential sites around the UK coast which meet the requirements of high tidal range and shallow tidal flats. It would be possible to generate approximately 20TWh, representing roughly 8% of current UK electricity consumption, using tidal lagoons.

**Predictability, Pumped-Storage, Balancing and the Grid**

The tides are precisely predictable far into the future. Thus the output of the tidal lagoon can be predicted with complete accuracy. The grid requires predictable power or it requires that the risk of using unpredictable power is covered with reserve or balancing capacity.

The tidal lagoon impoundment can double as a pumped storage facility. Off-peak power is used to pump up (or down) the water level in the lagoon thereby increasing the output from generation on the subsequent generation pulse.

If unpredictable power, such as wind power or wave power, is used for pumping, then the unpredictable (wind or wave) power is transformed into predictable tidal power. This transformation mitigates the need for maintaining balancing capacity and enhances the value of the wind or wave power. In addition, the tidal lagoon’s output is increased. Thus a win-win-win situation is created (unpredictable power becomes predictable-revenue is enhanced-balancing requirements are reduced).

Nuclear power plants cannot vary their output very quickly and the rapid variations in revenue between peak and off-peak periods can be smoothed by using wasted off-peak nuclear power to pump lagoon levels for dispatch at higher demand points in the demand cycle. This practice can enhance the revenue of nuclear power and reduce its burden on the public.

**Security of Supply**

Only the most cataclysmic events could threaten the security of tidal lagoons.

**Costs—Construction and Generation**

Tidal Electric’s financial advisers, NM Rothschild, have undertaken a detailed analysis of the construction and generation costs of tidal lagoons. They conclude that tidal lagoon generation, excluding subsidisation and economies of scale, is competitive with offshore wind, and arguably with more conventional methods of generation. The graph below highlights Tidal Electric’s costs compared to all other forms of generation, except nuclear.
(p) OFGEM published a report\(^4\) in April 2005 that found electricity from tidal lagoons to be less expensive than offshore wind, wave and tidal stream and more expensive than onshore wind.

(q) The cost per unit output of the offshore tidal power generator is less than that of the tidal barrage for the following reasons:

1. **Depth**
   Hydrostatic and hydrodynamic forces increase markedly with depth. The impoundment structure is built on near-shore tidal flats proximal to the low tide level and avoids deeper areas. In contrast, the barrage must span an estuary and must cope with whatever depths exist on the site. In the case of the Severn Barrage, the depths are up to 40 metres below low water.

2. **Load Factor**
   Barrages must generate primarily in one direction (on the ebb tide) in order to minimise progressive disruption of the intertidal zone that would eventually lead to the silting up of the head pond. The offshore tidal power generator is free to utilise both the ebb and the flood tides for generation, thereby roughly doubling the load factor of the barrage. Double the load factor is equivalent to halving the capital cost per unit output.

3. **Efficiency**
   Both the impoundment structure and the barrage are intended to hold back water. The power of the tides lies only in the tidal range, the difference in water levels between high tide and low tide. The impoundment structure is built so as to perform only that function, whereas the barrage also holds back all the water below low water level and all the water in the intertidal zone. None of this water produces any power, yet it is very costly to contain.

(r) Generation Equipment: The offshore tidal generator uses conventional low-head hydroelectric generation equipment and control systems. The equipment consists of a mixed-flow reversible bulb turbine, a generator, and the control system. Low-head hydroelectric generation equipment has been in existence for more than 120 years and state-of-the-art equipment is mature, mechanically efficient (96%+), familiar (over 450,000 units in use worldwide), reliable, and durable (the equipment comes with performance guarantees and a design life of over 50 years.) Manufacturers/suppliers include Alstom, GE, Kvaerner, Siemens, Voith, Sulzer, and others.

(s) The estimated capital expenditure cost of constructing the Swansea Bay 60MW lagoon is £79 million, and the capex cost for the North Wales scheme is £375 million.

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\(^4\) See Appendix 4 for Executive Summary.
DEVELOPMENT TIMETABLE

(t) The proposed schemes have been welcomed by Swansea City Council, Friends of the Earth and other environmental groups as well as a number of Members of Parliament and Peers, and members of the Welsh Assembly. In order to develop each scheme, we will require the consent of the DTI and other government departments and agencies. Discussions with the DTI, the Crown Estate, the Environment Agency and the Welsh Assembly are on-going.

(u) To assist us in taking our projects forward Tidal Electric has assembled an experienced, advisory team consisting of: NM Rothschild (finance), WS Atkins (civil engineering consultants), APBmer (marine engineering consultants) and RW Beck (hydrology consultants).

(v) Subject to receiving the necessary planning consents and environmental permissions, the timescale from first construction to operation is three years.

(w) During the construction phase, temporary jobs will be created and once each scheme starts operating, there will be permanent jobs for maintenance and operation. Secondary jobs will be created from secondary business and tourism activities. For reference, the tidal barrage in France has 600,000 visitors per year.

FINANCIAL INVESTMENT

(x) The project economics will allow the effective use of project finance for the development of Swansea Bay and/or the North Wales coast scheme, subject to receiving the necessary consents from government. Importantly, this means that no tidal lagoon projects will be reliant on financial support from the taxpayer beyond the Renewables Obligation programme.

(y) NM Rothschild has strong indicative interest from a number of UK and overseas financial institutions, for both debt and equity financing. In addition, we are also in discussions with several major energy companies with respect to potential equity financing of one or more facilities.

RELATIVE MERITS OF ALTERNATIVE TECHNOLOGIES

(z) While understanding the need to prioritise the development of additional and alternative sources of energy, the overall needs in the UK (and in the world as a whole) will eclipse the capacity of any one technology and necessitate the ongoing development of a range of technologies. As tidal lagoon generation does not compete for resources (eg land, tidal flow etc), we believe that the technology is complementary and additive to other technologies.

CONCLUSION

(aa) Tidal lagoon generation could reasonably generate 8% of the UK’s generation needs by 2020. The Swansea Bay and North Wales scheme would generate 490 MW by 2010.

(bb) Tidal lagoon generation offers the UK clean, renewable and predictable generation at a comparable cost to offshore wind and arguably others forms of generation. It also has potential social, economic and environmental benefits, including the protection of the North Wales coastline from further erosion and flooding.

(cc) Importantly, this new form of generation will help to meet the UK Government’s renewable and climate change targets. It would also be a significant step in the commercial development of the marine renewables sector and allow Wales (and ultimately the rest of the UK) to showcase the technology to the rest of the world.

December 2005

Written Evidence from Marine Current Turbines (MCT)

MARINE CURRENT TURBINES (MCT)

1. MCT is a Bristol-based company that is developing radically new technology for exploiting tidal currents for large-scale power generation. We do not have any commercially available products at present, but we aim to achieve this by 2007–08, ideally operating in UK waters.

2. The company works with the support of strategic private sector partner companies and has received significant financial support from the UK Government through the DTI, the Welsh European Funding Office Objective 1 Grant and from the European Commission. MCT presently employs 15 people full-time. Our chairman is Ken Vowles, a former Chairman of Scottish Power and our Managing Director is Martin Wright. Martin is chairman of the Renewable Power Association’s Ocean Energy Group.
TIDAL CURRENT GENERATION

3. Marine current turbines work, in principle, much like submerged windmills, but driven by flowing water rather than air. They can be installed in the sea at places with high tidal current velocities, or in a few places with fast enough continuous ocean currents, to take out energy from these huge volumes of flowing water. These flows have the major advantage of being the energy resource which is mostly as predictable as the tides that cause them, unlike wind or wave energy which respond to the more random quirks of the weather system.

4. The technology under development by MCT consists of twin axial flow rotors of 15m to 20m in diameter, each driving a generator via a gearbox much like a hydro-electric turbine or a wind turbine. The twin power units of each system are mounted on wing-like extensions either side of a tubular steel monopile some 3m in diameter which is set into a hole drilled into the seabed.

5. An experimental test single rotor device called “Seaflow” was successfully installed off Lynmouth, north Devon in May 2003 and continues to provide vital data that is crucial to the next stage of our development. The 300Kw Seaflow is the world’s first offshore tidal turbine.

6. A second larger tidal current device called “Seagen” is now being developed for installation in Strangford Lough, Northern Ireland. Subject to Seagen receiving the necessary consents from Northern Ireland’s Environment and Heritage Service, the 1MW twin rotor device will be installed in 2006–07, with sufficient capacity to supply electricity to approximately 600 homes in the immediate vicinity. It will be a recipient of a £4.27 million grant from the DTI’s technology programme.

   It is our intention to install a tidal stream device in Welsh waters within the next three years, subject to the results of Strangford, our own financial resources and the consenting regime. A clear and appropriate consenting regime is a key but often overlooked component for the future development of tidal stream and other marine energy resources in UK waters.

7. The basic requirements for cost-effective power generation from tidal streams using MCT’s technology are a mean spring peak velocity exceeding about 2.25 to 2.5m/s (4.5 to 5 knots) with a depth of water of 20 to 30m. We therefore consider that there are a number of potential tidal energy sites in UK waters, primarily around the coasts of Wales and north west Scotland. Our conservative estimate is that Wales has a generation capacity of 150 MW from tidal stream generation and would be connected to the National Grid within six years.

COSTS—CONSTRUCTION AND GENERATION

8. To date, the development cost for our Seaflow project has been in the region of £3.4 million. The final development cost for Seagen is likely to be £8.6 million by the time the device is installed in Strangford Lough.

9. Our techno-economic model which has been reviewed by investors, the DTI and their advisors calculates the cost of constructing a commercial tidal scheme of 10MW installed capacity to be in the region of £15 million which is comparable to off-shore windfarms. We are confident that with deployment of tidal arrays the costs will reduce with economies of scale and that the time taken for the wind energy sector to develop to this stage will be improved by MCT’s technology to be competitive with other conventional forms of fossil fuel generation within the next few years.

POLICY FRAMEWORK

10. In order to achieve our objectives, and to ensure that the environmental impact of our devices is understood and closely monitored we have worked closely with the various stakeholder groups at local and national levels. Consultation with these groups has been a key part of our development work. In addition, comprehensive Environmental Impact Assessments have been prepared for both our Lynmouth and Strangford Lough schemes, and on-going measures for monitoring is built into our work programme.

11. As a new technology, we accept that our projects must be closely scrutinised by the relevant agencies as part of the statutory planning consents and environmental permits process. However, there is a real danger that the precautionary approach that has been adopted by some bodies will put at risk the further development of our technology and indeed others in Wales and other parts of the UK. Companies such as ourselves may be forced to seek potential sites overseas or at worst find that the necessary financial investment is not forthcoming because of the onerous planning and political environment that persists in the UK. Additional demonstration projects for marine renewable technologies in UK waters, including Wales, are now urgently required to maintain financial confidence in the sector, and enable marine energy to contribute to the UK’s renewable targets.

12. Notwithstanding these present difficulties, we believe that, subject to receiving the necessary planning consents and environmental permissions, the timescale from first construction to operation of a commercial tidal current scheme is two years.
13. MCT is fortunate to have strong and supportive shareholders. Our main shareholders include EDF Energy, Guernsey Electricity and BankInvest, a Danish venture capital firm. Our other shareholders include private individuals.

14. We also have strategic development partners, including SeaCore which has expertise in marine installations.

15. We also have strong interest from a number of overseas energy companies and financial institutions who are keen to see our technology applied in other markets.

CONCLUSION

16. Our technology represents a novel method for generating electricity from a huge energy resource in the sea. It is rare enough for an entirely new energy resource to be developed but even rarer if the technology, as in this case tidal current technology produces no pollution and has negligible environmental impact, delivers energy to a predictable timetable and has the potential to make a major contribution to Wales’s future energy needs.

17. Although the relentless energy of marine currents has been obvious from the earliest days of seafaring, it is only now that the development of modern offshore engineering capabilities coinciding with the need to find large new renewable energy resources makes this a technically feasible and economically viable possibility.

18. The rationale for developing this business is based on several robust arguments. In the face of Climate Change and Peak Oil, the world urgently needs to acquire different energy resources with ability to deliver clean renewable energy in line with the UK and international government commitments and MCT can deliver a major and uniquely new contribution to this need.

19. The scope for meeting future energy requirements solely from land-based resources will be constrained by conflicts over land-use; so large renewable energy projects will need to move away from crowded land areas, preferably out to sea. Furthermore tidal energy can provide localised power generation, meeting the needs of smaller communities.

20. In short we believe that tidal current technology meets a huge new need, and can deliver energy in future, as predictably as the tides that drive it and with minimal risk to the local environment. We are pleased to note that this view is shared by the UK Government, the National Assembly, NGOs and various other Institutions.

30 November 2005

Witnesses: Dr Ian Masters, Welsh Energy Research Centre, University of Wales, Swansea, Mr James Orme, Director, Swanturbines Ltd., Mr Peter Ullman, Chairman, Tidal Electric, and Mr Joe Verdi, Commercial Director, Marine Current Turbines Ltd., gave evidence.

Q572 Chairman: Good morning. Can I begin by asking you to introduce yourselves and to explain something about your organisations or your institutions.

Mr Verdi: Good morning. I am Joe Verdi, the Commercial Director from Marine Current Turbines. We are based in Bristol. We have about 15 employees. Marine Current Turbines was formed in 2000. We have a 300 kilowatt prototype machine that has been installed in the Bristol Channel since May 2003. We will be installing our commercial demonstrator, which is a 1.2 megawatt tidal current turbine, in Strangford Narrows in Northern Ireland in September this year.

Mr Ullman: I am Peter Ullman. I am with Tidal Electric and we are the company that is keen to install a tidal lagoon in Swansea Bay. The reason that we are interested in Swansea and in Wales in general is that Wales has the second largest tidal range in the world and it has admirable geotechnical aspects to it that make it an ideal site for this technology.

Dr Masters: Dr Ian Masters from the School of Engineering at the University of Wales in Swansea. I am also a member of the Welsh Energy Research Centre responsible for marine renewable energy and co-ordinating research in and around marine areas for Wales.

Mr Orme: My name is James Orme. I am a director of Swanturbines Ltd., which is a device developer. I have six years’ experience in the industry. We are based in Swansea, leading a consortium of nine industrial partners. We are developing a Welsh tidal stream turbine system to reduce the cost of tidal energy and we have done testing on the River Tawe, and we intend to install a demonstration device next year.

Q573 Mrs James: This question is to Dr Ian Masters in the first instance. You open your written evidence by stating: “The UK Government should invest the value of one fossil fuel power station (£500m) over the next five years to build a marine energy industry in the UK.” Apart from the financial support, what could be done by Governments both in Wales and the UK to further promote this technology? Dr Masters: There are a number of things which could be done, and I am sure everybody else at the table would agree with me that the main issue is the
development of sites offshore where these devices can be put in the water, both at test stage and pre-commercial stage, to prove the technology. The technology exists. We just need to show that it can and will work. Something the universities can help with is looking at the environmental impact studies because there is very little time in the water and very little evidence about environmental impact—but that is expensive to gather and takes time and resources; and to put the onus on gathering that data on developers is a high overhead at this early stage in the industry. They are therefore looking at environmental issues. Also, it needs clear planning, clear management of the sea environment and the spaces, and the conflict with other users, and having some very clear lead from government about those things. There are financial incentives of ROCs, and perhaps the premium above ROCs as well, that should come from government. Remember that we are talking about power plants and we are talking about investment in power systems with a 20-year life cycle, so any policy with less than a 20-year timespan to it is a question to investors.

Q574 Mrs James: Would you say there is a level playing field in terms of government funding for marine and other renewable technologies?
Dr Masters: Between marine energy and other technologies there is a level playing field because they all attract the same subsidy, so buying tidal plant attracts the same level of renewable obligation and there is an exactly level playing field. Where it is not level is in the area of things like planning. Onshore planning is very well advanced and organised; offshore, there is a lot more ambiguity about the way planning is done.

Q575 Nia Griffith: Can I welcome the fact that we have so many different groups represented here today. What we really want to explore is the opportunities for all types of devices to be developed. I am sure there is room for more than one player. The sea is obviously an immense, huge resource for us. Can you give us an overview in terms of the contribution marine technologies could make to the energy needs of Wales?
Dr Masters: The Welsh Assembly’s target for 2020 is 7 tera-watt hours per annum of renewable energy. You can probably achieve three of those seven terawatts from wind onshore; there is just under 1.5 tera-watt hours per annum from tidal if fully employed, and of the same order of magnitude for wave. There is more uncertainty about wave resources. That leaves a gap of about 1.5 tera-watt hours from other sources like offshore wind, biomass and energy from waste; so it can make a significant contribution.

Q576 Nia Griffith: It does not sound that much compared, say, with wind. Could it be increased? Presumably, once the technology is known there must be huge numbers of sites that could be used. It seems to be quite a conservative estimate.
Dr Masters: It is realistic. The evidence from the Carbon Trust and Black & Veatch their consultants, is that they looked at some resourcing and tried to look at sites that are both technically feasible now and economically viable in the short to medium term, that is development which is economically and technically feasible now. In 10 or 15 years’ time we could revise those estimates up, but tidal could deliver significantly and wave could deliver significantly—but that order of magnitude with the technology we have today.

Q577 Mrs James: Obviously there is a range of different technologies now being developed. Can you give us a brief overview of what these different technologies encompass?
Dr Masters: There are a lot of different technologies. There are the tidal stream technologies from Swanturbines and Marine Current Turbines. There are different wave devices, which either float on the surface or are anchored to the bottom; the Pelamis device from Scotland, the power buoy being tested in Hawaii, and WaveDragon to be deployed in Pembrokeshire. There is the lagoon project as well. There are lots of different devices. What is common between them is that the only thing that is meaningful to measure is the energy output, the kilowatt hours per annum. Peak figures are very difficult to compare between technologies so it is the annual total output that is the measure. We are working offshore, so the significant cost is the maintenance cost. The technology must be reliable and have good-quality engineering, and those are the common factors between them. The other issue for devices that are on the surface and the wave devices is storm damage and the ability to weather extreme conditions. There are a number of devices that I have just mentioned that fit into those criteria: good engineering, reliable and reasonable costs.

Q578 Nia Griffith: How far offshore do you have to go? Can we not use estuaries? Where you have the rivers and the technologies, can we not bring some of these technologies quite close in?
Dr Masters: The wave regime is better if you go slightly further offshore, so one or two miles—although the WaveDragon device is quite close to the shore at Dale in Pembrokeshire. The tidal stream device is economically—the more water depth you use, the larger the device, so a depth of 20 metres is the minimum economically viable depth. You have to go a reasonable distance, not too far offshore, to get to 20 metres.

Q579 Mark Williams: You mentioned some of the different technologies that are now available. I suspect we are talking to the converted in terms of the generality of these forms of energy, but can you outline some of the advantages and disadvantages between some of the different things you have mentioned?
Dr Masters: It is a difficult question. The one metric is: how much energy does it produce in a year and what is the capital cost you need to achieve that energy? To say that one device is better at surviving a storm condition and another device gives a smooth power—it is the technicalities of the engineering. We have to have a very careful look at devices to see
those differences. The other important factor is that different sites, particularly with tidal stream, may lend themselves to different solutions and different devices; and different wave climates may lend themselves to different wave devices. When somebody is putting a project together, when they want to deploy 20 devices, they will look at their particular sites and the site characteristics and find a device that works for those characteristics at the right price. It is an almost impossible question to answer unless you are talking about a specific site.

Q580 Mark Williams: Which varies because—one has a vision of plonking down a wind farm on the uplands of Wales whereas you are looking at the uniqueness of a particular scheme and how it affects the locality issues and generation capacity.

Dr Masters: Yes. The wind regime is pretty much the same wherever. The way that the wind blows is the same almost everywhere. If you go into deep water the wave regime is different, and around the coastlines you have lots of variations.

Q581 Mark Williams: Which of the technologies you have outlined to my colleagues’ questions is the most developed?

Dr Masters: The devices that have had the most time in the water, so MCT’s device on the tidal, Pelamis and the Ocean Power Technologies’ device. WaveDragon has been in the water for two years as well, so all of those add time in the water and development. There are 50 device developers in existence, but about half a dozen have had time in the water.

Q582 Mark Williams: What sort of timescale are we talking about, Mr Verdi? What is the timescale if you are working on research? When were these projects initiated?

Mr Verdi: The concept was about ten years ago but it has taken three years to get to our 300 kilowatt prototype that has been installed in the Bristol Channel. It took about five years to take us to SeaGen, which is our commercial demonstrator machine that we will be installing in September this year.

Mark Williams: I was going to ask you about the suitability of different schemes in parts of Wales but we have covered that.

Q583 Chairman: Can I ask Dr Masters about the importance of the Welsh Energy Research Centre in your own research and in the interface between universities and the private sector: does it play that kind of role in bringing different partners together?

Dr Masters: Since the Welsh Energy Research Centre has been formed I have put together a team of six different research groups around Wales that have a broad interest both in engineering and in the environmental aspects—oceanography at Cardiff and Swansea and engineering in Swansea and Cardiff, and also a group at Bangor—to look at bringing together a team to look at some of these wider environmental effects on a particular site. We have started the discussion since the formation of the Research Centre with that group, and we will be putting together a project.

Q584 Chairman: It has made quite a significant change in the way you are developing your research?

Dr Masters: Yes.

Q585 Chairman: Then the interface with the private sector—does it play a facilitating role in that way?

Dr Masters: We had a meeting of the marine sector in Wales at Pembroke Dock, which was quite successful in bringing people together and starting that engagement with the private sector. I am also working on a European project with WaveDragon, so the links are there.

Q586 Mark Williams: Turning to the practicalities of the schemes, how are the marine technologies you have mentioned connected to the National Grid? What problems do you envisage have to be overcome in that area?

Dr Masters: Grid connection is a fairly straightforward and known technology, and these devices will connect in the same way as any other reasonably sized renewable technology. It is known technology.

Q587 Mark Williams: Can you elaborate to the uninitiated like myself as to what that involves?

Dr Masters: You would have farm devices connected together to a local sub-station. You would perhaps transmit at a particular high voltage DC, depending how far offshore. You connect to a local sub-station and make sure your output was at grid quality and then connect into the grid at that point. Wales has a reasonably good grid close to the shore, because there are lots of population centres close to the shore and there are places you could tie into on the coast. It is a lot better, say, than the north of Scotland. There are a lot of resources in the north of Scotland but there is nobody there so there is no grid there. There is the possibility of connecting into good grids in Pembrokeshire, North Wales and South Wales where there are population centres. It is more straightforward than in other parts of the UK.

Q588 Nia Griffith: Have you looked at any micro generation projects, for example the Land Registry having turbines tied to the road and rail bridges and linking that into a local factory, something on a much smaller scale?

Dr Masters: It is technically possible but probably not economical.

Q589 Mr Jones: Mr Verdi, can you briefly explain to the Committee how Marine Current Turbine’s product works, and can you comment on the advantages and disadvantages of the technology?

Mr Verdi: Marine Current Turbine works in a very similar fashion to a wind turbine. The only difference is that it is underwater. It harnesses this tremendous flow of water that goes through headlands and channels. In terms of energy capture, it is a lot more efficient than wind turbine because
water is nearly 800 times denser than air. It also works on the very basic principle that it is an axial flow machine and a horizontal axis at that, so very similar to a wind turbine. The difference where it comes between wind turbines and our technology is the tides are very, very predictable and actually produce energy to a programme. It does not produce it 24 hours a day because the tide changes every six and a quarter hours, but you know exactly what it is going to produce, and that has a tremendous value in the energy that we produce.

Q590 Nia Griffith: Presumably you have a reverse device on it, and it works both ways!

Mr Verdi: Yes. Our rotors are fully pitched so when the current changes direction they will turn 180 degrees.

Q591 Nia Griffith: So you do get the in-tide and the out-tide.

Mr Verdi: Yes.

Q592 Mr Jones: What do you say are the disadvantages and advantages of this technology?

Mr Verdi: The advantages are that we have a patented system on that where we raise the whole drive train up above water level, so there is no underwater intervention. It is easy to maintain. It is in essence a mono-pile installation so the footprint that it leaves is basically the size of the pile. It penetrates the waterline by seven or eight metres, which is about the same height as a channel marker. It has very little visual impact. There are concerns in terms of marine life, but, again, with our experiences at Lynemouth—and we are still doing a lot of studies—the rotors only turn at about ten revolutions a minute, which is actually very slow. In high tide places the marine life that lives there is used to living in very high tide streams and they are used to feeding themselves and are very agile. We do not believe there is a tremendous impact. The only disadvantage is that we do not run 24/7 because the tide changes, on the shoulders—

Q593 Mr Jones: There is a hiatus when the tide changes. How long is that period for?

Mr Verdi: It varies. It could be anything from twenty minutes to an hour.

Q594 Mr Jones: That, presumably, is highly predictable.

Mr Verdi: Yes.

Q595 Mr Jones: Mr Orme, how does the technology we have just heard about compare with what you are developing in your company?

Mr Orme: The Swanturbine device is similar in that it is like an underwater windmill. It is an active flow turbine. The main difference is the method we use to support the turbine underwater. We found that with the benefit of hindsight in looking at some of the instances that have been suggested as devices for tidal flow generation—we have worked out that this support structure that we have chosen to use is the most efficient method for getting it in and out. Studies undertaken by our industrial partner CB&I John Brown have indicated that the installation and maintenance costs are the primary drivers in the viability of the system over the lifetime. This cost is therefore reduced by a clever method of installation. Unfortunately I am not able to tell you the exact method that we are using because it is currently under patent—I am sorry about that. The other thing which is different about our device is that it does not use a gear box, so we have increased efficiency in the drive train. It means that we use a clever generator, which runs at low speed rather than the high-speed type which you might find elsewhere. It is similar in a sense to the Enercon wind turbines, which have the largest market share in Germany. We believe that has a number of advantages: reduced maintenance requirements and more reliability if you get rid of the gear box; and there is less noise underwater, which should prove less intrusive to marine life.

Q596 Nia Griffith: Where on the River Towy is your experiment based?

Mr Orme: We towed it from the university research vessel so it is not there any more. We tested it in front of the Technium, which is opposite the marina.

Q597 Mark Williams: In relation to your prototype you mentioned the concerns. What was the public perception locally?

Mr Verdi: At Lynemouth we have had tremendous support. They want to know when we are going back there to actually build an array. In fairness, and being cynical, it is better than onshore wind, I suppose!

Q598 Nia Griffith: Can you tell us what the potential generation capacity of tidal stream generation is in Wales from Marine Current Turbines, and within what timescale this could be operational? Linked to that, can you identify any sites around Wales and what sort of feasibility studies have you done on the sites?

Mr Verdi: We have got a grant from Wyfal and have conducted our study in terms of assessing the resources around the Welsh coast. We have completed that and part of the study is to take one of those sites to consent. In roll-out we see an array, subject to consents being given, in about 2008. We intend to have something like a 10 or 13 megawatt site, presumably off Anglesey. The resource around north Anglesey—again it is potential resource, subject to planning—is of the order of around 180 megawatt, so we see that rolling out starting off with 30 and then 50 and then going to 100 megawatt within five to eight years.

Q599 Nia Griffith: So you could see yourselves supplying Anglesey Island with electricity.

Mr Verdi: Well, 200 megawatts—I believe Wylfa is about 950, so we have got some way to go. But there is plenty of resource around. Wales is blessed with marine current and potentially we would feel there is about 8%; in fact there is 1 gigawatt potentially available.
Mr Orme: I would agree that 8% is the figure with those areas in mind. There are some off Pembrokeshire, and off the south Barry coastline. At present we are looking for somewhere to put a demonstration device, so one single one, but we intend to be able to supply a range of devices in 2010 or 2011, at which time we intend to be supplying 30 to 50 devices in one of those regions.

Q602 Mrs James: Are you finding it difficult to get these concepts over to government agencies that it is a very shifting market; that we do not know where we are going to be in five years’ time with fuel generation and other? We are talking all the time about costs today and competitive costs with nuclear today, that it is making sense that the fuel crisis or whatever would affect us greatly in the future.

Mr Verdi: It is. Ian mentioned it. In terms of commitment from Government, it is support and actual commitment. The Renewal Obligation Certificate goes out now to 2027, so you have only about 20 years left. If you start an array now, you will not build it, say, for two years; and you are reducing in terms of that support that the Government has committed to. So if you think of an array that starts in five or eight years’ time, you reduce the support that you get from the Renewable Obligation Certificate. Government can help by extending that and giving more commitment. It gives a good signal to investors and also to the City because at the moment, in terms of project finance, all we can do is take it up to 2027. That is one of the reasons why it slows down development in terms of getting finance. I should think the majority would go up to 2027 and then just drop . . . .

Q603 Mrs James: What positive practical steps do you intend to take in order to get the ROCs further to give them the idea that the Government is supportive of this, 100% in support. Also, planning is a big issue. These areas are areas of outstanding natural beauty and other special areas. With this technology, tidal stream, it is most important that we are able to plan to use these areas for the good of the environment in general. The planning system must be streamlined to enable these developments to take place in the short to near term, or medium term. For us at the moment, which is an early stage of device development, we need permission to put in a trial device, which is a two-year thing. It is a temporary installation, but the rigmarole we have to go through to get that into the water is phenomenal, and to streamline that would be of great help to us.

Q604 Mr Jones: Mr Verdi, you mentioned the difficulties with ROCs. Can you expand on that? What other obstacles do you see to the development of this technology on a commercial basis?

Mr Verdi: It is investment. We have to be able to demonstrate to any investor that there is a firm revenue stream. It is very much a catch-22 situation: while our prototype or our first commercial demonstrator costs money, a lot of it is getting their confidence to say they will order. The bills, shall we say, for 20 machines—your purchasing power increases tremendously. You get economies of scale in installation as well. Your grid connection costs, whether you put one machine in or whether you put 20 machines in, is about the same. That supports the project finance. As James has said, and as we mentioned, if the Government could underpin—whether it is an in-feed or tap or even keep the ROC fixed for a longer period, that would give tremendous confidence to the investors, and that will kick-start it. Once you get the first array in, in terms of megawatts I firmly believe the utilities will then sit up and see that it is a viable technology and they will then be prepared to take more of a risk than they are taking now.

Q605 Mr Jones: Is there any reason why this technology is so far behind wind technology both in terms of development and in terms of investment?

Mr Verdi: In terms of development, no. We started in the early 80s, but that was when fossil fuel was very cheap, so it was shelved. Why people are taking an interest now is that it is inevitable—the decline in
fossil fuel and the rising costs of fossil fuels. We have to look at alternate forms of energy, and generally the public are aware of that now.

Q606 Mr Jones: Is there any reason why development and investment is so far behind wind, for example, because there seems to be a high concentration on wind as a renewable energy source in this country?

Dr Masters: I started my evidence saying that we should invest 500 million in this technology. If we went back thirty years to 1976 rather than 2006, and if we had the foresight to invest in the UK wind industry then, we would now have a viable wind industry. We currently import all our turbines from Denmark, Germany and Spain. To say that 500 million is not very much when you consider that 3.2 billion people live within 100 kilometres of the sea, all those people need energy, and a lot of those people do not have energy at the moment. They are moving to industrialisation. There is a huge world demand for energy and for devices to generate energy, and if half the world populations live on the coast, then 500 million to develop an industry to export to that industry is peanuts. But that is a serious amount of money to get the technology to where wind is now.

Q607 Mr Jones: How receptive do you find the Government to your representations?

Dr Masters: The DTI has made a start; there is the 50 million wave tidal demonstration scheme, and support through the technology programme, but it is not of that order of magnitude.

Q608 Nia Griffith: You are saying the wind technology has come about because other countries have taken the lead.

Dr Masters: Yes.

Nia Griffith: Perhaps because we have the best tidal resources we should be taking the lead and getting in the market while the market is good.

Q609 Mrs James: Basically, we could be in danger of missing the boat again if we do not invest in these technologies now.

Dr Masters: Yes.

Q610 Mrs James: And in 20 years’ time we will be getting this technology from other countries . . .

Dr Masters: Yes.

Q611 Mr Jones: Reverting again to the obstacles you touched on in your submission on onerous planning consents and other procedures, can you expand on that and give some examples of the concerns you have raised?

Mr Verdi: One of the main concerns we have had to go through is the precautionary principle; this thing that “it has never been done here yet, so do not even try”. We had tremendous problems getting consent for our machine that is going at Strangford Loch. There are lots of people that just say, “you do not know what it is going to do to the environment, so don’t install it.” The reality is that you have to install it somewhere and accept that it may or may not have an effect, but the only way you are going to find out is to get it into the water. That took a lot of convincing, and technology developers like us do not have the time or the balance sheet to sit down for years and conduct these debates and surveys. We have done a lot of best studies and proved it in terms of the speed, the density of water, the number of strikes one would expect. We are getting there, but it is very much the precautionary principle. The other one is what happens if a species gets displaced. It should invest 500 million in this technology. If we could get displaced because of global warming, or went back thirty years to 1976 rather than 2006, and because the food cycle moves somewhere else. All those things we do not really know until we get there. The other parts that we find very difficult is a lot to do, again, with whether it is grid connection or—it is very romantic to have these generators, but when you start talking about commercial farms, you will always cause some disruption, and while the public say, “it is nice to be green”, the moment you say—people do not have energy at the moment. They are renewable energy is very localised. Unlike fossil fuels, it is not usually transportable, so you have to export that energy, which means either an overhead line or you put a cable in the ground. When you come to do that you find that the public get quite objectionable about it, and that is what we are finding now. Those are the objections we are seeing.

Q612 Mr Jones: This is in the context of the planning procedure.

Mr Verdi: Yes.

Q613 Mr Jones: You have experience of such objections?

Mr Verdi: Yes.

Q614 Mr Jones: Presumably, you have to make application for Town & Country Planning permission.

Mr Verdi: Yes.

Q615 Mr Jones: Do you also have to make an application to the DTI for consent under the Electricity Act?

Mr Verdi: If it is over 50 megawatt, we have to go for section 36.

Q616 Mr Jones: So both of those procedures would apply to your industry just as they do to offshore wind for example?

Mr Verdi: Yes.

Q617 Mrs James: A little earlier, Mr Verdi, you talked about the WEFO funding and various funding streams. Can you tell us how much you have received from various environmental agencies so far, like the Assembly, the European Commission and the DTI? How have you spent this money?

Mr Verdi: For SeaFlow, our prototype, we got a very small sum of money from the European Commission. The rest of it we got from the DTI and that grant was in total about 2.1 million. Marine Current Turbines and its shareholders funded the rest, which was something like 1.4 million. SeaFlow cost us 3.5 million. SeaGen, which we are building at
the moment, is 50% funded by the DTI; the other 50% is match-funded by ourselves, so that is 4.8 million each. The WEFO grant we have to do the assessment of the resources around the Welsh coast is £704,000, and that is about 38% of the actual budget cost. We have funded the rest ourselves.

Q618 Mrs James: They are quite significant sums from WEFO.
Mr Verdi: Yes.
Mr Orme: To date we have been granted from the Knowledge Expectation Fund about £400,000, which has been the development and testing of a 1 metre diameter prototype as was tested in the River Tawe. Also, then there has been a desk exercise in which—it is a collaborative industrial research project with eight partners who have come together to design the 350 kilowatt demonstration device, which we are planning to install shortly. That has been over a period of about four years. It is about half a million in total.

Q619 Mrs James: Never enough, I should imagine!
Mr Orme: No.

Q620 Mark Williams: Mr Verdi, in your submission you have expressed confidence that this technology would be competitive with other forms of fossil fuel generation. Have you any financial back-up to that statement? How long do you think it will take for the technology to be competitive in that way?
Mr Verdi: We have got back-up in the sense that we have just under three years’ experience of SeaFlow. We know how much it costs to generate electricity and the operation and maintenance costs. Our SeaGen installation in Strangford Loch will be our commercial demonstrator, so that will say what it says on the label—the costs to generate. With the economies of scale and building up the array, I would have thought that by 2010 we would be very comparable to fossil fuels. It is very difficult to say because fuel costs are rising and that cross-over may come sooner.

Q621 Chairman: Can we now turn to Mr Peter Ullman and begin to talk about Tidal Electric and tidal lagoons? Can you explain briefly how tidal lagoons work?
Mr Ullman: Tidal lagoons are a form of low-head hydro-electricity, which has been around for about 130 years. It uses equipment that is conventional; and it is manufactured by large companies like General Electric, Siemens, Kvaerner, Voith and so on, and comes performance-guaranteed—that is the technology risk is taken up by insurance. The way it functions is that the low-head hydro-electric turbine is installed in an impoundment structure. It has come to be called a lagoon because it is a much more descriptive term, but it is a structure built out of rock, sand, gravel, in a conventional marine construction fashion. It sits a mile or so offshore, and is self-contained. It is sometimes called a ring-dike—but it will not be round. The water at high tide, when the impoundment is empty—there is a difference in water level. So the power source is the difference in water level as in a conventional dam. This is different than a tidal stream in which the power source is essentially the horizontal movement of the water. The horizontal movement of the water is irrelevant to this particular technology. What you create with the impoundment structure is a difference in water level, and then the difference in water level is harvested—the energy is harvested by allowing the water from the high level to go into the low one. Then what you have is a full situation where the tide drops away to do the opposite; so it is a two-way generation using conventional low-head hydro-electric.

Q622 Chairman: Can you give us some examples in the United Kingdom of tidal lagoons?
Mr Ullman: No, there is no tidal lagoon that has been built in the United Kingdom, or anywhere else. Tidal power of this sort is most similar to a barrage style tidal power. Barrages have been around for several thousand years. The largest tidal barrage is in France; it is a 240 megawatt unit that was put in service in 1965. It uses similar turbines to the ones we plan on using. It has functioned since 1965. There have been some difficulties here and there but it has essentially been working for 47 years. There is also another one in Canada, a 16 megawatt unit that was installed in 1982 in order to demonstrate a Swiss turbine. It is a familiar power source, but it has never been done in the offshore manner that we are planning on doing.

Q623 Chairman: Can you outline some of the advantages and disadvantages of tidal lagoons?
Mr Ullman: One of the advantages is similar to the other forms of tidal power, which is that it produces predictable power. This is key of course because that is the way the grid functions. It functions on a predictable set of contracts, and you have to know what you are going to be able to send when, otherwise you have to be able to back it up. The second is that it uses conventional equipment. I do not need to tell you that these other folks have been working on climbing the technology curve and proving their technology. It is very important: electricity has to be provided in a reliable and consistent manner. Quite a lot of money goes into building a power plant and therefore the risks need to be carefully assessed. This particular technology, has the advantages that—there is no technology risk. I personally have seen a low-head hydro-turbine that has been functioning for 120 years in Sweden. It was built 120 years ago and construction of this equipment has advanced. The equipment is reliable; its output is known and the risks are ones that can be offset. This is important in convincing investors to invest in a project. It uses no fuel. This is, opposed to some of the tidal stream devices, a big part of the estuary. There is no getting around that. In Swansea Bay we are proposing a project that will be 60 megawatts, and it is 5 square kilometres, which is a significant part of the area of the Bay. It is by no means the whole area of the Bay because the Bay itself is many times that, but whenever you do that, you change things. One of the advantages as well as
the disadvantages is the size. It is a rock structure; it is natural and will look just like the shoreline. If you have ever been there at the Mumbles you can see it—not very plainly but the rocks form the shoreline, and it will look just like that physically. What happens almost immediately is that small creatures take up the habitat in there; larger creatures come to dine on them and so on. It is a new habitat. It is expected that this will enhance the biodiversity of the area. The intertidal zone and the near-shore tidal zone is famously barren; not that there is nothing that lives there, but there are precious few creatures there that take up habitat there. Because of the size and the natural structure of this, it will create a wildlife habitat. The flip side of that advantage is that because it is big it is going to change things in the Bay in terms of currents, sediment transport, and the general flow of traffic in Swansea Bay. That is why we have Associated British Ports as part of our team, to assess the sediment and transport issues to make sure that we are not causing difficulties; one to put sand where it should not be, or to take sand away from where it should be. It is complex. Sediment transport is an issue in Swansea Bay as it is. ABP for example dredges almost every month, and two months do not go by without them dredging their shipping channel. There are already complexities therefore. As you probably are aware the Crumlyn Burroughs is an area threatened by coastal erosion, and so this is a very careful issue that one needs to go into in great detail. Another advantage is that in its building we are not doing anything that has not been done before many times. There are secondary applications that have been proposed. People have asked us, “Can you put a wind turbine on top of it? Could you grow mussels inside of it or lobsters, fish—marine fishing and so on.” Even a bicycle path was proposed in a project that we are looking at in North Wales. All of those are things that I feel would enhance the interactivity with the community. However, none of those are our business. We are marine developers; we are not lobster men or any of those things. Nevertheless, there are people who live in those areas that do those things and are interested in the business opportunity of working with us. We are keen to do that and have those discussions frequently. The next advantage is the tourists. Strangely enough, the tidal power plant that I mentioned in France gets 600,000 visitors a year. I do not know what they come to see. I have gone to see it myself, and it is not a terribly exciting trip!

Q624 Chairman: Is that at St Malo?
Mr Ullman: Yes, St Malo, right. As I see it, there is not a lot of excitement. I was there when the lock was working and you could see a boat go through. Nevertheless, when I was visiting the tidal power plant in Canada there was a group of 20 engineers from China. Some amount of people are going to come to look at this because it is unusual, it is new, it is different. If it goes in first in the world. Some amount of tourism will occur. In terms of disadvantages, it is similar to marine current turbines, which is that it is not always available. It is predictable but not always available.

Q625 Nia Griffith: The size of it is what is putting some people off. Is there any possibility that there could be smaller ones developed? The other issue is where all the material is to come from to build it. Again, people have talked about tonnes and tonnes that are going to be needed. Can you address those issues?
Mr Ullman: The size determines the output. Well, there are two factors—the size, that is the area covered, and the tidal range. The output is a function of the square of the tidal range, so the larger the tidal range the larger the output per unit area. That is a given, by the tides. Then the area will determine what the multiplier is. It could be done smaller; however the point of building the first project is not to prove that low-head hydro-electricity works—we are not demonstrating that of course because it has been working for more than a century—but the point of building the first one is to prove the economics of the technology. The economies of scale will work in both directions so the smaller you make it the more expensive the output; and the larger you make it the less expensive the output. In terms of materials, they will be acquired from a variety of sites. It is unlikely they will come from one site. They will all be transported to the site by barge; none of it will be coming by road or by rail. The contractors that we are dealing with own their own quarries. Some are in Norway, some in Spain, and in a variety of locations; but nothing is coming through Swansea Docks or over rail. Even if one were so insensitive as to want to do that, the economics of shipping that amount of material in that fashion are unthinkable and unfavourable.

Q626 Mark Williams: Can you give us more detail on the tidal lagoon and its potential as a pump storage facility, and the technology behind that; and then more generally you spoke a great deal about the technology, but the extent to which that is commercially available currently.
Mr Ullman: In terms of pump storage, it is an interesting component of the potential revenue stream of this project. The way pump storage works is that you use electricity to pump water up during a time of the day in which electricity is cheap, like in the middle of the night; but then you generate during a time when the revenue from electricity is greater. This is a common practice in North Wales and it is used around the world to deal with a variety of situations. That is the basic economics of it. With a tidal lagoon, as I said earlier, the output is a function of the square of the tidal range. If you had a condition in which you had just finished generating and it is high tide, and you pump water into the lagoon, you raise the level by a certain amount. Let us say, for demonstration purposes, the tidal range is ten and you pump one, and make the tidal range into eleven. Then, when you generate you do not have 10; you have 11; so you get 121, 11 squared, as opposed to 100. The gain is 21%2. This means the energy that you use to pump. The energy that you use to pump tends to be somewhere in the 2-3% range. What you wind up with is the ability to use pump storage with an efficiency that is potentially greater
Mr Ullman: Let me put my feelings in context. First, Q627 Mark Williams: Do you share the frustration mechanical gain; and then when you dispatch it or send it to the grid you do so at a time in which the revenue is favourable. Therefore, you can then realise the gain of giving the grid power when it wants it during tea-time or peak times of the day, and also sending it more power than you would have available. The second potential for using pump storage in this fashion is that you can take less predictable renewables, like wind or wave, and use that as the source to pump, because you can pump any time. Then, when you dispatch it, because the tides are so predictable, you can take unpredictable power and dispatch it as predictable power. Unpredictable power is considerably less valuable both in terms of revenue and usefulness to the grid than is predictable power; so in a way you are helping the wind and wave folks and the grid by pumping in this fashion. It is commercially available now. We are in the process for applying for consents for a 60 megawatt unit in Swansea Bay. We have consulted with 55 different consultees relating to this, and we are on a pathway to developing this 60 megawatt unit.

Q627 Mark Williams: Do you share the frustration that your colleagues expressed about the potential for this? We heard earlier that had the investment been put into wind power 30 years ago we would have been much more advanced along that route; but now we are beginning to turn our sights to schemes you have spoken to us about. Do you share the frustrations that had research investment gone into these schemes earlier on we would be that much more advanced now?

Mr Ullman: Let me put my feelings in context. First, I would like to say that the UK has done a tremendous amount to support renewable energy in terms of research and development programmes and so on. I come from a country in which such an effort has not been made by the federal government. I will say that 21 of the states of the United States have copied the UK’s renewable obligation, so there is some leadership there. Then there has been a fairly sizeable amount of money that has been distributed to renewable source technologies. Tidal Stream has had £50 million. The offshore wind folks have got £100 million. Money has been given to biomass, poultry litter, a number of studies and so on. I get very expensive brochures in the mail about surveys and so on. A fair amount of money has been put into tackling this problem. I will note that no money has been dedicated to tidal lagoons; they have been supported exclusively privately.

Q628 Mark Williams: In that sense you do see yourselves as the junior partners.

Mr Ullman: Well, I like the term “partner”, but “junior” is definitely—we have had no support from the UK Government in terms of that. In terms of frustration, it just means you are doing things that are new and it has not been easy to work on this project here in the UK in terms of dealing more with DTI than with the rest of government. The local folks have been tremendously supportive and enthusiastic and so on. Most of the political world has been very supportive too. I will say we have had no support from the DTI.

Q629 Nia Griffith: Do you see a particular reason why that has been the case? What is the difference between yourself and the others? Is it that it is long-term; is it that it is too big? Is there a reason?

Mr Ullman: There may be a reason, but I do not know what it is. At various times we have been told that this is a mature technology that does not need support. At other times we have been told that we have dramatically under-estimated the cost of the installations—which one would think would therefore qualify it for getting support. Neither of those is true. We are doing something that is new. It is difficult to do new things. The first project is projected to cost £79 million. I do not have £79 million to convince various private entities to fund it. We have had success with that, but it is not easy to do things that are new.

Q630 Nia Griffith: Do you see it as somewhere where other countries might step in, Spain for example?

Mr Ullman: I have been at this a long time, seven years, and after being all over the world, in Panama, India, China, Canada and all over looking at various sites, I decided on the UK about seven years ago. Five years went by and frankly it looked like we were never going to get permission to proceed and I did start looking at other countries. We are now active in China, Canada, Mexico and Panama. That said, if anybody in Wales would like to participate in the manufacturing process, there are a number of parts and elements that need to be made for these projects and there is a significant amount of money involved in these orders, and then we would be glad to work with somebody who wanted to step forward.

Q631 Mrs James: You have obviously approached the DTI under section 36 because it is generating over 50 megawatts. You see the key partners you want to be working with on development as the DTI. You have gone or permission to the DTI and you are saying that the log jam seems to be the DTI. Are there any other options that you have—the Assembly, WEFO?

Mr Ullman: In terms of consents, do you mean, or in terms of funding?

Q632 Mrs James: Funding.

Mr Ullman: No, we have given up looking for public funding. It has been discussed a number of times and it just does not appear to be available to us. We have had success in raising the money privately and appear to be on a positive course to handling this on a commercial basis. This is not to say that we would turn it down if it were to come our way, but we do not expect it.

Q633 Mrs James: Dr Masters’ written submission to the Committee stated that there were three questions that remained unanswered about the technology: the operational life of the turbines in a flow regime with
significant suspended solids; the effect of silt build-up within the lagoon; neighbourhood you have touched a little bit on the environmental impact of the scheme. Can you give us more information on the turbines and the flow regime?

**Mr Ullman:** The turbines come performance-guaranteed. There are roughly 450,000 of them in the world today of different sizes and different settings. Suspended solids are a common issue; every river has a certain amount of silt. Some have tremendous amounts of silt, and some have smaller amounts of silt. It is an issue, and one designs the turbine for that. It is an important question and it is a problem if somehow somebody would not think about that; but of course it is a problem that has been resolved many times in materials. For example, in France, where they have the 240 megawatt unit, there are 24 of these turbines that have been functioning for over 40 years in a similar kind of environment. Every environment is different, and the environment changes from day to day, year to year, but in the broad range of this type of installation that is a good example. As I mentioned, in fresh water I personally have seen a unit that has lasted for 120 years. They are pretty durable. They take major maintenance about every 20 years. In regard to silt, as I mentioned, we have hired Associated British Ports to help us to sort that out because this is a key issue. I think Dr Masters was probably referring to the siltation inside the structure.

**Dr Masters:** Yes.

**Mr Ullman:** This is a question I first raised back in the early 1990s at the Yale School of Geology and Geophysics with Dr Edward Bolton, and we talked about this at great length. His off-the-cuff response was that with a six-hour time period in which you are flowing in and then flowing out there is not enough time for a significant amount of silt to drop out and therefore it is likely—not a sure thing—that this will not be an issue. He also advised us on a number of design elements. Siltation occurs in inverse proportion to the depth so if you have a very shallow area you will get more siltation than if you have a deeper area; so we have designed the inside of the structure to be deep, that is a metre or more of depth at all times, which would reduce the siltation. Given that the general calculus is that it is unlikely to be a great amount in either direction, it still leaves you with the possibility that you are wrong, and some unusual event happens and silt does get entrained on the inside. Under those circumstances there are two solutions, if there is a problem. I do not want to get too technical, but when you set up any sort of wall inside of this, what you do is change the flow, and you change the velocity of the flow in and out of the structure. When you increase the velocity in a particular direction you will create scouring; so if you have had too much siltation you aim the velocity at the build-up and you scour it, and then you can rotate this wall such that you self-scour the entire structure. That is the likely solution. In some sort of disaster scenario you can also dredge. The flip side of this, which people tend not to mention, is the opposite: what if you scour out too much and start to undermine the soils, and given that we have thought of that there will be a screen that is put in place so that that will not happen.

**Q634 Mrs James:** You talked about the size being 5 square kilometres. Do you have any major environmental concerns or awareness of any particular problems you can draw to our attention?

**Mr Ullman:** Let me tell you the problems that people question us about. One is what happens to a fish that goes through the turbine. Believe me, fish do not like going through turbines and adult fish are able to sense the pressure wave whenever you start a flow underwater. They simply avoid it if they can. If it happens to be an anadromous fish that has to go from fresh water to salt water, and there is a dam in the way, there is no avoiding it and therefore they go through. Of the fish that go through, they do so unhappily but 94% survive. Because our structure will not be in the way of an anadromous fish that wants to go from fresh water to the ocean or the ocean back to the fresh water to spawn, they will simply circumnavigate it. There is no reason for the sensible fish to go through. Therefore, if there are a thousand fish coming down the river, all thousand of them have to go through that turbine. If there are a thousand fish that encounter our structure, one, two or three might get suddenly pulled into it, and of those very few fish that get entrained, 94% of them will survive. In terms of biodiversity, there is no getting around the fact that this is a big structure and will create a habitat, but in general folks have been pretty upbeat about that—birds, fish; and fishermen and so on should enjoy this either as a restaurant or a recreational facility.

**Q635 Mrs James:** One of the questions I have been asked about locally is angling off the surface, people fishing from boats. People have been very, very concerned about that. Can you set their minds to rest about that?

**Mr Ullman:** There will be a lot more fish for them to catch. What is their concern?

**Q636 Mrs James:** That they will hit it.

**Mr Ullman:** Well, they might, and they will have to watch it for that. I do not know why they would hit it—if they were wanting to go out and stand on it and fish—is that it?

**Mrs James:** No, on a boat. Perhaps you could write to me about that.

**Q637 Nia Griffith:** People in small boats: presumably, this thing will be under the water.

**Mr Ullman:** It will be quite visible. It will never be less than a metre visible and it will have navigational lighting, the same way anything else will have, and various warning systems.

**Q638 Nia Griffith:** You are saying even at high tide it will be visible.

**Mr Ullman:** Yes.
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Q639 Mrs James: Coming back to costs, how do tidal lagoons compare with other forms of power generation, particularly the cost of nuclear power stations?

Mr Ullman: We had a number of studies done on costs. The first study was done in 2002 by AEA Technology and that was a broad-brush concept study. They came out with the cost. In 2004 we had this impressive book created by WS Atkins and Associated British Ports. This was a more specific study of a 60 megawatt unit installed in Swansea Bay. Their cost is £79 million for the Swansea Bay project. In terms of comparing it to other technologies, my expertise does not extend very far beyond tidal power. However, our financial advisers, NM Rothschild—a bank that I am sure you are familiar with—did a study of a variety of ways of looking at costs of power. I believe that that is in the packet I gave you. This, by the way, was done for the very severe rise in the cost of natural gas. Nuclear power—I am afraid I am not an expert, and when the Government owns plants one tends to not really ask about what the costs are. However, I can say that in the US where the nuclear power plants are not government-owned and they are owned by private entities, between 1950 and 1990, $492 billion was spent on nuclear power, of which $97 billion were subsidies. The cost of power—again in the US where the playing field is tilted in a slightly different direction—from that nuclear was 9 cents per kilowatt hour or about 5.1 pence. The best way to compare this is to compare it with more familiar other forms of power, and that is about three and a half times the cost of coal or natural gas.

Q640 Mr Jones: You have identified two locations in Wales as potentially suitable for development of tidal lagoons, Swansea Bay and Rhyl. Can you bring the Committee up to date with the current status of both these projects?

Mr Ullman: The Swansea Bay project has been studied by Atkins. We have a good sense of what the cost will be. We have done hydrology studies, which tell us the output. To do that you take British Admiralty data on tides and break it down into six-minute increments and take an equipment package and actually run it on a computer so you get the output. It is important to know what the output is so that you know what the cost per unit is to be able to compare that with the revenue stream that is potentially there. We are comfortable with that. We have at this point an agreement from DTI that we can go ahead and proceed to apply for consents. The consents people, by the way, have been lovely and good to work with and facilitative and so on. We are doing that work. We have talked now to 55 different consultees, everybody from the harbour master in Swansea Bay to RSPB and lots and lots of people. The North Wales project is not as far advanced; it is a much larger project. When I went to North Wales a number of times I spoke at a variety of public meetings in Bodelwydden Castle up there, and the people told me about the problem of coastal erosion. You will probably remember the Towyn floods in 1990, which were devastating to the folks in the area.

They said: “We need this coastline to be defended against erosion.” I took a tour of the coastline and saw the Christmas trees in Prestatyn and all of that business, to try and prevent the erosion. So I designed a structure that would stand in the way of the dominant fetch—that being the wind and the waves that hit the North Wales coastline. It is big because it is designed to defend that coastline.

Q641 Mr Jones: What sort of acreage are you talking about?

Mr Ullman: It is 23 square miles in area. It is almost nine miles in length, and the output is 432 megawatts.

Q642 Mr Jones: A serious power station.

Mr Ullman: A serious power station. Wallingfords had done a flood risk assessment completely independent of this and so I went to Wallingfords and asked them if this worked; does it defend the North Wales coastline. They said it does. Therefore, one needs to look at that as a potential asset of installing this—that you get the coastal defence for free.

Q643 Mr Jones: Have you any estimate as to the cost of that Rhyl development?

Mr Ullman: Yes, the cost estimate—which is not as extensive as this but was done with some rigour—is £375 million.

Q644 Mr Jones: Are these schemes single, double or triple pool schemes in Rhyl and Swansea Bay?

Mr Ullman: At the moment the design for Swansea Bay is as a single pool. The North Wales project would need to be a multiple pool—whether three, four or ten pools remains to be seen for a further design stage. The point of single, double or triple, is that because the tides happen twice a day the optimal times for generating are high tide and low tide, and the transitional periods in between are less optimal. If you have a single pool you can get generate about 48% of the time. By dividing the pool into three you can pulse generation from each of the pools and increase the amount of time during the day. In Swansea Bay, for example, by going from a single pool to a triple pool you increase the time of day from 48% to 81%. This allows you to hit tea-time and times at which the grid is needing power a lot more often than not.

Q645 Mr Jones: So a triple or multiple-pool design would have a significant impact in terms of output. Would it also have a significant cost implication?

Mr Ullman: The cost would be somewhat higher for the impoundment structure because you have to build these internal walls, but lower for the equipment, because you do not need as much equipment. At the end of the day there is some improvement in the cost of the output, that is the unit cost of power, by going to a multi pool. You would also have the enhanced capacity to use it for pump storage.
Q646 Mrs James: What is the unit cost?
Mr Ullman: There are many answers to that. Let me tell you where we have been on that. When I first did the numbers the costs came out at about 3.1. 3.2 pence per kilowatt hour. In 2002 we had a study done by ABA Technology—and I am sure you are familiar with them—and their result was that it came out at about 2.5 pence per kilowatt hour. That is more optimistic than ours. In 2004 we did the Atkins study and the cost of power is about 3.3. In addition, OFGEM did a study comparing renewables as part of the submission, which you may have seen, and they put in a number of other contingencies and factors and brought that all up to a different level. OFGEM’s result—they studied onshore wind, tidal lagoons, offshore wind and everything else—that is wave and tidal stream. Basically, the results were that onshore wind was the cheapest and tidal lagoon the second cheapest.

Q647 Chairman: You talk about coastal defences; do you get public funding from the Environment Agency for that?
Mr Ullman: No, we have had no public funding whatsoever.

Q648 Nia Griffith: Talking about jobs, you mentioned about making some of the machinery that would be needed. Can you tell us what sort of jobs there might be in the construction phase and what sort of jobs there might be in an enduring industry to look after the lagoon, and in an industry which might export the technology?
Mr Ullman: Let me start with things I am more certain about. In terms of operating the actual project there are very few jobs; it will be operated remotely. People will come to visit it frequently but it just does not need any care. In terms of secondary applications, tourism and so on, that is a multiplier that you would be more familiar with than I am. The construction period is roughly two years. Again, I cannot promise too many jobs in the construction because it is clearly a mechanical process. The materials come from some place else and are essentially just dumped on the site, so there is not a whole lot of hand work in there. The jobs created—there would be significant jobs created for those who make the generators and the turbines. At the moment there is nobody in Wales that does that, and if somebody in Wales wanted to do that of course we would be keen to work with them. Exporting jobs: we have hired WS Atkins to do our studies. In the process of doing the studies on the Swansea Bay project, they developed an expertise which we have already hired them for in Canada to use, so in that sense there are some jobs that have been exported.

Q649 Nia Griffith: You mentioned about the technology lasting 120 years and so forth, and a 20-year maintenance interval. Are there issues of corrosion? What are the main issues you are facing in terms of maintaining the technologies?
Mr Ullman: Having a metal object in the ocean of course creates the potential for corrosion, and it is a very important maintenance issue. The solution for metal objects in the ocean is what is called cathodic protection, in which you place a small cathode on the object and you pass an electrical current through it. This is the way oil drilling platforms, ships and other items in the ocean protect themselves from corrosion, and it will be the same solution for our equipment.

Q650 Chairman: Would any other witnesses wish to answer that question?
Mr Orme: I agree.

Q651 Mr Jones: I wanted to ask you earlier, Mr Ullman, about the question of costs. Presumably, in the case of Swansea Bay and the North Wales project you would have to negotiate Crown leases.
Mr Ullman: Yes.

Q652 Mr Jones: Are you in negotiation with the Crown on that, and if so how advanced are the negotiations?
Mr Ullman: We have had discussions with the Crown Estate and they have laid out their expectations. They would want a lease and on the other side of the lease they want a responsible counterparty, that is they want a big balance sheet. They also want a reasonable business plan and provision for decommissioning. The key about this decommissioning—they are concerned about what they are terming residual responsibility; that is, Tidal Electric goes bankrupt and for some reason leaves a functioning 60 megawatt power plant and abandons it; nobody else picks it up and they are stuck with it.

Q653 Mr Jones: It presumably requires some sort of bond.
Mr Ullman: Right. The initial stages would be a bond and then there would be a fund that puts funding for decommissioning in place.

Q654 Mr Jones: How far advanced are the negotiations for that? Do you have a lot further to go?
Mr Ullman: We do not have a lease agreement even on the table, so that is about where we are, which is that they have laid out their requirements and we feel completely in sync with those requirements and feel they are reasonable and intend to meet them.

Q655 Mr Jones: There is nothing too intimidating about them.
Mr Ullman: No.

Q656 Mark Williams: Do you have any background information on the Severn Barrage scheme or the WaveDragon scheme in Pembrokeshire, Milford Haven, any gems that you would like to share with us?
Dr Masters: I have some information on WaveDragon. They have funding in place from KP Renewables recently, funding from the European Framework Programme and from WEFO to build their first 7 megawatt device, which is going to be approximately 350 metres long and several thousand
tonnes in weight. It is a significant piece of equipment. They want to roll that out from a single device to a farm of ten or eleven devices in two or three years’ time. The issue that WaveDragon has is that there are no planning procedures for a multi-unit wave farm in existence, and they want to be applying for that now rather than waiting for the policy to work out, because they have got the funding and they have got the technology. They are in the early stages of building and deploying off Pembrokeshire.

**Q657 Mark Williams:** The Severn Barrage has been mooted for so many years. You say it is no further ahead. What is your perspective on that?

**Mr Ullman:** I have just had a discussion with the folks that have been pushing the Severn Barrage. I am sure you know that was studied from 1974 to 1987 and was eventually shelved because of costs. They are still looking at it. They are still hoping there is some financial reality to it.

**Q658 Nia Griffith:** You included in your evidence the research by Friends of the Earth, the study saying lagoons are better than the barrage. Do you feel strongly that is the case, and can you see any potential for having a tidal lagoon in the Severn Barrage area?

**Mr Ullman:** The Severn Barrage is potentially sited in the best tidal area in the UK, which is the second best in the world, and certainly tidal lagoons could be installed there. One would think that as this technology rolls out certainly it would be a potential site there. There are four basic problems with the barrage: it blocks navigation; it impedes fish migration; it changes the head pond in the area back of it; and it changes the tidal regime downstream. Put those altogether and it creates an economic problem. When you bundle that all together it has been unrealistic to proceed with this. This is before you tackle the environmental issues involved.

**Q659 Chairman:** Can I end by asking all of you this question. Of the schemes we have discussed today are they the only suitable sites in Wales, or are there potentially other sites for this kind of technology?

**Mr Ullman:** The North Wales coastline; I have been asked to look at the Liverpool docks area, which is a potential site; all of the Severn estuary; and the Thames estuary: they are the sites for tidal lagoons.

**Q660 Mark Williams:** Mr Verdi mentioned initially that there was a ranking procedure, particularly schemes around Wales had been ranked in terms of preference—

**Mr Verdi:** Marine Current Turbines?

**Q661 Mark Williams:** Yes. How extensive is that list?

**Mr Verdi:** We have ranked it as the Skerrys first, then South Stack, Ramsey Sound, Bardsey, Bishop & Clerks and Pembrok.

**Chairman:** Thank you very much for your evidence, including the written evidence you gave to us earlier.
Monday 8 May 2006

Members present

Dr Hywel Francis, in the Chair
Nia Griffith
Mr Martyn Jones
Albert Owen
Hywel Williams
Mark Williams

Written Evidence from All Wales Energy Group

EXECUTIVE SUMMARY

This report highlights the major concerns of the All Wales Energy Group (AWEG). It provides a comprehensive picture of the current position in Wales and in its conclusion proposes what it believes to be rational suggestions for alternative appropriate policies.

INTRODUCTION

The All Wales Energy Group was founded to argue for balanced and effective energy policies. We are committed to exploring means by which energy conservation and low carbon technology can be introduced on a wide scale in order that CO\textsubscript{2} reduction targets may be met and security of supply enhanced. At present security of supply is not improving, and carbon emissions continue to rise. The decision of the Welsh Affairs Select Committee to focus on energy is very timely, and we welcome it.

PART 1: WELSH ASSEMBLY ENERGY POLICIES

1.1 Energy is not a devolved power, so the Welsh Assembly (WAG) cannot decide on the fundamentals of energy policy. Nuclear and the frame of reference of the renewables programmes are both outside the Assembly’s remit, as is the system of Renewable Obligation Certificates (ROCs). CO\textsubscript{2} reduction targets have been set nationally.

1.2 The Welsh Assembly’s energy remit is therefore limited to the execution of UK Government policies. WAG policy and consultation documents include the following.

(a) Economic Development Committee: draft Report on Renewables (March 2001)
(d) Draft Technical Advice Note 8 (TAN 8), and Ministerial Interim Planning Policy Statement on Renewable Energy (MIPPS) (July 2004)
(e) Energy Saving Wales (October 2004)
(f) Final version Technical Advice Note 8 (TAN 8) and MIPPS (July 2005)
(g) Consultation document: Energy Wales: Route Map to a clean low carbon and more competitive energy future for Wales. Consultation ended September 2005
(h) Consultation Document: Our Environment, Our Future, Your Views. Consultation ended October 2005

SUMMARY OF WAG DOCUMENTS

Renewable energy only: documents (a), (b), (d), and (f).
All energy including renewables and low carbon: document (g).
Energy conservation: documents (c) and (e).
All aspects of the environment including renewable energy: document (h).

1.3 “Energy Wales Route map” (Document (g)) is the most comprehensive of all the policy documents. On page 4, five important energy policy strands are identified:

(i) Securing 4 TWh pa of renewable electricity production by 2010 and 7 TWh by 2020.
(ii) Much greater energy efficiency in all sectors, as is described in the “Energy Savings Wales” energy efficiency action plan of October 2004.
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(iii) More electricity generation from cleaner higher efficiency fossil fuel plants.
(iv) Significant energy infrastructure improvements.
(v) On a holistic basis, achieving measurable CO\textsubscript{2} emission reduction targets for 2020.

1.4 AWEG responded to the detailed policies listed in the document as follows:

1.4.1 Energy efficiency and conservation

In our view, more emphasis should have been given to energy efficiency measures. Furthermore, transport issues were also entirely omitted from the report.

Energy efficiency is supremely important and should form the central focus of any energy strategy. While we welcomed the Assembly’s proposed efficiency measures, we regretted that the proposed action plan is still only a proposal, when active policy should have been implemented at least four years ago. If energy efficiency measures fail to slow down the rate of growth in energy use, then any carbon savings from renewable energy will be swamped.

1.4.2 The 4 TWh target

We noted that the Energy Route Map failed to quantify the potential contribution of the different technologies to the overall reduction in emissions, which was particularly disappointing given that Our Environment, Our Future, Your Views, had clearly stated that “Our Energy Route Map will set out the contribution that different technologies and different scales of generation can play.”\textsuperscript{1}

The failure of the Energy Route Map to take an inclusive, holistic approach that deals with all aspects of energy use and production will inevitably hamper the Assembly’s attempt to create “a clean, low-carbon future for Wales”. For example, some of the technologies mentioned in the Route Map such as hydrogen and biomass do not apply exclusively to electricity generation. However, the compartmentalisation of energy issues within WAG means that questions surrounding transport, one of the biggest contributors to CO\textsubscript{2} emissions, is dealt with by another department and not taken into account in the Energy Route Map.

1.4.3 Renewable energy development

(a) Development of on-shore and off-shore wind power

In our judgment, WAG’s policies are overly concentrated on windpower, both offshore and onshore. There is convincing evidence to show that these schemes are at best fuel savers only, and their contributions to emission reduction are modest, painfully won, and very costly. We draw your attention, for example, to the E.ON Netz Wind Report of 2005.

Opposition to large-scale wind farm developments has become a significant social and political issue in Wales, and other parts of the UK, due to their visual intrusion, noise, impact on residential amenity (and thus house prices), and tourism. The technical limitations of wind, in regard to its stochastic nature, is now well known, and it is widely judged by those familiar with the arguments that the impact of wind development vastly outweighs the benefits.

An energy policy that fails to acknowledge this will be hopelessly mired in public confrontation and controversy, during which time the development of other more benign and indeed more energy effective technologies, such as biomass, solar, tidal and wave power, will be frustrated.

(b) Development of biomass

We welcomed the Assembly’s support for this technology. We believe that this strategy should also include the cultivation of crops to be used as the feedstock for bioethanol and biodiesel for transport. Again, we regret that the proposed action plan is so late in coming on stream.

(c) Development of marine (wave and tidal) energy systems

We supported the Assembly’s encouragement of marine technologies such as wave and tidal. However, the proposed WAG timetable for developing these technologies will cause unnecessary delays. There is no need for a five-year trial period, as both wave and tidal lagoon technologies are commercially available now. In our view, the Assembly’s programme for marine energy technologies should not focus on further technical investigation but on immediate implementation.

It should be noted that Wales has a rich marine resource, and it is not unreasonable to anticipate that a judicious mix of tidal, and perhaps wave, schemes could easily surpass the 7 TWh target for 2020, perhaps delivering this ahead of schedule.

\textsuperscript{1} Our Environment, Our Future, Your Views, p 33.
1.4.4 Coal/carbon capture and storage

AWEG welcomed the proposed development of carbon capture technologies. We agree with the Council for Science and Technology’s statement:

To achieve a global decrease in CO₂ emissions, investment in low carbon technology which can be used in many places world-wide may be a better proposition than attempting to exploit very high technology methods with the potential of only low market penetration.²

Carbon capture is a technology type that could be exported, particularly to India and China, and therefore represents a great market opportunity for Wales.

1.4.5 Security of supply improvements

AWEG believes that the ability of micro-generation to provide a substantial percentage of electricity supplies should be acknowledged. Micro-generation also lends itself to CHP, further enhancing its value.

We note also that Carbon Capture and Sequestration would enable fossil fuels such as coal to be used with minimum CO₂ emissions. The potential for Wales should require no further comment.

1.4.6 Energy infrastructure strengthening

The WAG proposal to extend the national grid is premised on the need to serve the large quantity of windpower anticipated. It is the stated view of AWEG that wind farms do little to reduce CO₂ emissions, and that little at a very high cost. We conclude, therefore, that it is unwise to make wind power a major element in any strategy or programme in which the stated aim is to reduce CO₂ emissions. Simply, there are more effective and cheaper ways of reducing emissions, such as energy efficiency measures or micro-renewables, which would not require strengthening and extending the current grid system.

It is at least arguable that marine renewables would not require significant extension of the grid. For example, wave-farm schemes off Pembrokeshire and Anglesey could be fed into the existing grid at Holyhead and Milford Haven, without the need for any onshore extensions, though reinforcement might be needed.

1.4.7 Drive for innovation

AWEG sees a pressing need to work towards the establishment of a hydrogen infrastructure. Commercial use of hydrogen should be encouraged, as soon as possible, for transport and electricity generation.

We have already noted our view that energy efficiency and micro-generation are preferable routes to emissions reductions. It is obvious that both areas offer considerable potential for innovation, and then for export. For example, new supermarket developments should be encouraged to showcase energy efficiency initiatives, park-and-ride schemes utilising carbon-free transport, and on-site renewable energy technologies, creating a low-emission retail space.

1.4.8 Carbon dioxide reductions

We support the Key Task to “research ways to assess the holistic effects of energy projects from a global low carbon economy perspective” (Energy Wales Route Map). However, we fail to see any evidence of such a holistic approach. As stated in our opening comments, the energy agenda is narrowly defined by WAG, thus excluding areas, such as transport and energy conservation, without which it is impossible to conceive of a low carbon future for Wales.

1.4.9 Welsh Assembly policy since 2001

WAG energy policy documents are dominated by a single technology, industrial onshore wind. This is a grave matter of concern, and it is interesting to note that earlier consultation documents on renewables were less partial. For example the Welsh Assembly Government Economic Development Committee’s draft Report on Renewables March 2001 (document a) lists a number of possible ways of generating electricity. Included under the classification of very large potential is wave and off-shore wind, both described as having only intermittent availability. On-shore wind is listed as having large potential but only intermittent availability, as is solar photovoltaic. Energy crops are acknowledged to have large potential and high availability. Unfortunately, even this rather more balanced and informed document only accords tidal flow moderate potential, though predictable availability, which is surprising for a geographical zone blessed with the second highest tidal range in the world.

1.5 In our view, it is deeply unfortunate that, because of the emphasis on wind power, there have been no major initiatives to support these other important technologies. The DTI has now belatedly withdrawn all its objections after holding up the Swansea Tidal Lagoon Project for about four years. But it now looks as if the first tidal lagoon project will be in China, not Wales. Similarly, while the world’s first commercial wave farm is now being constructed in Portugal, Wales has nothing. Biomass and solar energy are as yet almost completely undeveloped.

1.6 As a consequence of the WAG’s segmenting the subject of sustainable and renewable energy into separate areas (TAN 8, for example concentrates on electricity generation by wind power), there is no sense of how the elements are to be integrated, and balanced. For example, energy use in Wales is still rising but WAG does not seem to see the link between ineffective policies on energy conservation and increased energy use.

1.7 Conclusion

Energy issues have been viewed separately rather than collectively. This has led to an unbalanced, and thus ineffective, renewable energy programme that has favoured one technology to the detriment of all others. The result has been a major failure to (1) contribute to security of supply, or (2) curb CO₂ emissions, while at the same time severely compromising vast tracts of upland scenery with wind turbine development.

PART 2: THE ROC SYSTEM

2.1 The renewable obligation certificates provide a means whereby producers of certain categories of renewable energy can obtain a subsidy directly proportional to the amount of energy produced. The main beneficiary is wind energy which enjoys unlimited access. Solar energy is excluded and hydroelectric limited to 20 MW per site. The National audit office in its March report heavily criticises this crude form of subsidy which they calculate is double that justified to ensure adequate profitability for the wind energy industry. They point out that though currently accounting for 2–3% of electricity consumer’s costs this will rise to 4% by 2010. It conflicts with the government’s aim of eliminating energy poverty. The Parliamentary Public Accounts Committee has also strongly criticised what they consider essentially to be a regressive tax on electricity consumers which avoids their annual scrutiny. The TUC is also concerned of this addition to industry’s electricity costs for very little return in carbon emission savings.

2.2 Conclusion

AWEG recommends the abandonment of this indirect subsidy to the least productive form of renewable energy, or at least its modification such that “firm” and predictable (and therefore usable) generation is better rewarded.

PART 3: THE EXPERIENCE OF OTHER COUNTRIES

3.1 The leading countries in large-scale wind farm technology are Denmark and Germany. Germany has achieved some 17,000 MW installed capacity of wind, a vast quantity which generates only about 5% of the country’s electrical energy needs.

3.2 The E.ON-Netz Wind Report 2005

E.ON Netz GmbH is a major German grid operator serving a population of 20 million people living in 40% of the country’s land area. It runs 32,500 km of high-voltage and extra-high voltage power lines, and is responsible for integrating 7,000 MW of wind power, nearly half of all that installed in Germany. The Wind Report 2005 offers clear evidence of the problems accompanying large scale use of wind.

3.2.1 E.ON Netz points out that “Capacity credit” (the degree to which a generator can replace other generators) for wind is low (8% at present), and falls off dramatically with large quantities of wind. Indeed, E.ON estimates that should Germany build wind power plants with a 48,000 MW capacity, this will only replace a secured 2,000 MW of conventionally generated power (the equivalent of just two new-generation coal blocks).

The report goes on:

The fact that the gap between internal power consumption and power production is continuing to widen in the north of Germany has serious consequences for E.ON Netz. Even today, Schleswig-Holstein and northern Lower Saxony have wind turbines with an output of 5,400 MW. When strong winds coincide with periods of low power demand, northern Germany becomes a power export region. Each additional wind energy build-up aggravates the situation still further as the regional low load remains stable at a figure of just about 3,300 MW. In five years output will
already be 7,000 MW! For the purpose of comparison: This is more than the whole of Italy physically imported from France, Switzerland, Austria and Slovenia during the great blackout of 2003.

3.2.2 Both Denmark and Germany could not have achieved their current levels of wind power without ample electrical connections to neighbouring countries. The UK has no such links apart from a modest one with France. Consequently, any ambitious wind farm programme in the UK would entail internal grid-balancing, the costs and challenges of which are considerable.

3.3 Conclusion

Large-scale use of wind farms in Germany and Denmark has created the following problems:

— power production unconnected with demand;
— low capacity credit, resulting in fuel saving at best; and
— grid balancing challenges and costs.

We are not confident that these challenges have been adequately recognised in UK energy policy, and are almost entirely absent from Welsh policy.

PART 4: THE PROBLEMS WE FACE

4.1 In addressing the issue of climate change there is a need to focus on two central problems:

— the need to reduce CO₂ emissions; and
— the need to ensure a permanent secure energy supply.

These can be divided into the following issues:

— Reduction of CO₂ emissions either by using clean technology that does not produce CO₂ or by reducing energy use.
— Reduced reliance on finite and increasingly costly fossil fuels in order to reduce CO₂ emission.
— Ensuring a permanently secure energy supply for Wales and the UK.
— The need to work with other nations, currently producing far more CO₂ than the UK, on solutions to solve the issue of climate change. This is vitally important if the UK is to have any impact on global emissions. As things stand, if the UK stopped producing all CO₂ emissions, the total emissions produced by the world would only be reduced by 2.3%. We must therefore develop technologies that are commercially attractive to the emerging economies such as China, Russia, India and Brazil.

These important issues are not addressed succinctly in one document by the Welsh Assembly, a significant omission.

PART 5: POTENTIAL RENEWABLE ENERGY RESOURCES IN WALES

5.1 There are two fundamentally different ways to make electricity:

— Centralised generation: supplying electricity to a national grid which serves consumers.
— Micro-generation: supplying electricity at the point of use or very close to it, as in community schemes.

Both systems have a role to play. Micro-generation often (but not inevitably) needs a connection with a centralised grid, so surplus power can be exported, while any local shortfalls can be avoided by importing current. Micro-generation, however, is efficient in a way that centralised generation can never be. There are no losses from the grid. Extensive increase in the use of Micro-generation would not require any massive extension of the grid, as is necessary in the development of wind farms. Heat arising out of the micro-generation process can easily be recovered and put to good use in a Combined Heat and Power Unit, which is more problematic with centralised generation. Micro-generation is well suited to the geography of Wales, which has over 100 miles of sparsely populated countryside between the highly urbanised North and South coasts. Micro-generation however can also be used to great effect in built up areas, as has been shown in Woking.

The Woking Example

Woking Borough Council claim that the energy wasted by the centralised system is enough to heat every home in Britain. They also claim that $1 billion worth of electricity is lost to the grid each year. By using
private wire schemes, consumers of Woking Borough Council (through Thameswey, its local independent electric generation and supply company) are provided with current at up to 5% less cost than any neighbouring electricity supplier.

Woking is also noteworthy for impressively reduced CO\textsubscript{2} emissions. Between 2002 and 2004 a town with a population of 89,900 saved an average of 48,843 tonnes of CO\textsubscript{2} per year. If every community in Wales were as effective as Woking, the reduction in CO\textsubscript{2} would be 1.6 M tonnes. If every wind farm were built according to the TAN 8 provisions, the CO\textsubscript{2} savings in 2010 from the 1,120 MW of installed capacity would be just over a 1 M tonnes (using DTI figures of 0.24 load factor and a grid average emissions factor of 0.43 tonnes of CO\textsubscript{2} per MWh).

One has to ask the question why consumers are having to pay more—about £50 million a year for the whole of Wales for a CO\textsubscript{2} reduction strategy that is 50% less effective than an already proven and cheaper alternative.

Woking, it is worth noting, makes effective use of Combined Heat and Power (CHP) schemes. This exploits the inevitable heat given off in any electric generation system by using it to heat buildings or to heat water. CHP can be used in large-scale generation plants, but tend to be costly because of the long runs of heavily insulated pipework that they require. In most cases it is more effective to use small-scale generators that are close to the point at which both heat and power are required. Greenpeace in Connect, Autumn 2005 points out that the centralised grid system loses up to 65% of its initial energy input.

5.2 Energy efficiency

The key to using renewable energy is to use it efficiently. There is little point in pouring public money into expensive schemes if the energy generated is squandered. From 2000 to 2004, the UK’s CO\textsubscript{2} emissions went up from 152.8 M tonnes of carbon to 158.4 M tonnes (560 to 580 M tonnes of CO\textsubscript{2}—a rise of 3.5%), despite a substantial expansion of renewables, including wind power. CO\textsubscript{2} emissions can be reduced through energy efficiency. This takes several forms:

— Reducing heat loss from buildings, by increasing insulation and reducing draughts. New buildings can be designed to make the most of passive solar gain.
— Installing more energy efficient equipment and plant.
— Using better control systems for heating and lighting, eg using PIR detectors to automatically turn lights on or off.

Energy use is very much determined by lifestyle. If people could live much closer to work, could use a public transport system that they knew was clean, reliable and safe, if they felt their children could safely walk or bike to school then energy use would be greatly reduced. It is no accident that the sector with the fastest growing emissions is transport. In short, the use of energy is a planning and public security matter, as well as matter of central government policy. We conclude that central government should make the reduction of energy use their very first priority.

5.3 Solar power

The Centre of Excellence in Sustainable Energy and Process Management submitted a discussion paper on energy policy to the WAG Economic Development Committee in 2001. It made the following observations:

In terms of solar flux, Wales is one of the more favoured regions of the UK apart from the south coast of England. Wales averages 2.75 kWh/M2 in solar radiation flux which compares to 4 for southern France.

An average figure for efficiency of a solar panel in Wales is however highly misleading, as local conditions vary so much. The Lleyn peninsula, for example, enjoys far more sunshine than Snowdonia, although only a few miles apart. Solar panels have been installed in Wales D one of the largest arrays of PV panels in the UK is at car makers Ford’s Bridgend plant D but generally their use is limited. One of the world’s leading manufacturers of PV panels is based in Wrexham but their products are almost entirely exported.

Solar panels could be used on very many different buildings, from huge industrial plants and supermarkets, right down to houses and even garden sheds. They can be used to make hot water or to make electricity (PV panels). In Wales, they are primarily a micro-generation technique although in Denmark large arrays are used to supply heat and power to communities, with the energy stored in large well insulated hot water tanks.

AWEG has examined the potential for solar power in a special study paper (see Appendix). This concluded that the mass installation of solar panels would cost the public less money and save far more CO\textsubscript{2} than the TAN 8 proposals for extending wind-power.
5.4 **Biomass**

Biomass, along with hydro-electric and tidal schemes, is noteworthy as providing the most consistent and reliable power supplies of all the renewables.

5.4.1 Forestry in Wales covers about 14% of the land area \( D \) just under 290,000 Ha (hectares). About 195,000 Ha of this is conifer, and represents a large resource. The Mid Wales Energy Agency believe that converted into wood chips or pellets, this would be sufficient to heat anywhere between 10.3% and 19.6% of the entire 1.2 M housing stock in Wales. The large variation in this estimate is due to the possible difference in investment levels that could bring this massive change about. In other words, the more the investment, the more fuel.

Forest crops could include willow coppice, which can be grown in swampy ground that would otherwise not be suitable for forestry. In this way, the forestry area of Wales could be increased.

This form of biomass could be used for both micro-generation and small-scale power stations, ie ones that could be supplied within a 20 mile radius.

5.4.2 There is some 200,000 Ha of arable land, and 933,000 Ha of permanent grass in Wales. There is also 440,000 Ha of rough grazing. No doubt a significant proportion of this could grow an energy grass crop such as has already been grown successfully in upland Wales and Herefordshire (see walesbiomass.org website). Trials at Llys Dinam suggest that these crops will produce the necessary yields in large parts of Wales. They include miscanthus, switchgrass, and native reed canary grass. A bio-mass company has plans to grow 10 Ha of miscanthus in Pembrokeshire. Professor Mike Jones, an Irish expert on energy crops, believes that if miscanthus was grown on 10% of the suitable land in Europe, then it could generate 9% of the gross electrical production. Like forestry products, these could serve small local power stations and community projects.

5.4.3 **Anaerobic digestion**

This converts cattle waste into methane and other gases. The digesters can then be used to power generators. A recent example of this comes from the USA where a dairy with a herd of 800 cows in Elk Mound, Wisconsin, supplies 6.5m kWh of electricity pa. Wales has 271,500 dairy cows. Applying the Elk Mound figure of 8.125 MWh per cow pa to the national herd achieves an output of 2.2 TWh. If the 216,800-strong beef herd could be included as well, it would supply another 1.7 TWh.

This promises to be a technology very well suited to Wales. Not only would it produce a good income for farmers but numerous small communities could be supplied all over the country without the need for drastic extension of the grid.

5.4.4 **Hydro-electricity**

It is unlikely that there are any sites left for a major hydro-electric scheme in Wales. There is still potential for development of small-scale schemes in Wales, although to date the substantial tariffs imposed by water companies for using water as a power source has killed off a significant number of projects. Ironically, since the introduction of Renewable Obligation Certificates, the installed capacity of hydro power in Wales has dropped as owners have rushed to renovate their plant by reducing its size to 20 MW in order to qualify for ROCs. Perhaps the greatest potential is to put small plants into the weirs that will have to be built to control flooding along the major rivers. Again this would be for micro-generation or for a community supply.

5.4.5 **Large-scale wind power**

Wind power technology is relatively well advanced so it is not surprising that many people have been persuaded that this is the only way to generate renewable electricity. However, it has major drawbacks that are becoming increasingly obvious. The largest problem is the erratic nature of the wind, which results in low load factors (the amount of power supplied in a given time compared to the potential of the installed capacity) of just 0.24 for Wales (DTI figure). Because electricity cannot be stored on the industrial scale, it has to be used as and when it is generated. This can happen at any time such as the middle of the night when demand is low. In Denmark this has led to electricity exports, at bargain basement prices and a substantial cost to the Danish taxpayer whose subsidy supports wind generation.

Against this low intrinsic value must be weighed a substantial environmental impact. Few sites in Wales are free from forestry. Indeed, every one of the seven SSA’s identified by TAN 8 is heavily forested. If the Clocaenog SSA was developed for wind power stations, approximately 750,000 trees would have to be felled, otherwise the Load Factor of any wind farm in the area would be reduced by a quarter. Given the DTI Load Factor is 24% for Wales this would mean a very disappointing figure of about 18%. Since trees absorb and
fix CO$_2$, while peat reserves in upland areas are valuable resources for carbon sequestration, it is important to recognise that wind energy in Wales comes at a significant price, and while these carbon debts may be repaid in a certain period of time, the cost of the wind turbine’s emissions abatement effect is thereby increased.

5.4.6 Small-scale wind power

This avoids many of the problems of large-scale wind farms. Wind power, when it is incorporated into a micro-generation scheme, may not require back-up, either through the use of battery storage, or the use of electrical energy to heat water which can be stored in heavily insulated tanks.

AWEG have carried out a study into the costs of small-scale wind turbines as compared with large-scale wind farms supported by the ROC system. This shows that small scale is far more efficient and cost effective. We believe that small-scale wind power should be encouraged, and to this end planning laws should be amended so these schemes are easier to implement.

5.4.7 Geo-thermal

This is divided into two very different types of technology:

- Deep bore: energy from far down in the earth’s crust as could be done at Southampton and Paris (this is geothermal proper).
- Shallow ground or water extraction: extracting the latent heat from the earth or lakes and rivers.

Generally, for Wales, it would be second type, shallow ground of water extraction, that is best suited. Small-scale wind turbines could work very well with a geo-thermal system.

A geo-thermal system can achieve a return of 300%, ie for every 1 kW put in, 3 kW can be extracted. It is a very old principle: a large volume of low-grade heat is converted into a small volume of high-grade heat. In the past, the Royal Festival Hall used the latent heat of the Thames and is now being used in the HQ of the Cooperative Wholesale Society in Manchester, where heat will be taken from a canal. It is not cheap to install, but very efficient, has long-life plant, and could be used with other micro-generation techniques to great effect.

5.4.8 Wave power

Although much of Wales’ coastline is washed by relatively calm waters, it does have access to rough sea conditions off Pembrokeshire, Ynys Mon and the Lleyn. According to WAG, wave farms will still need another five years of development. This is pessimistic. The order for the first commercial wave farm has already been placed off Portugal, and indeed the components are being built by a ScottishWelsh Company, Camcal, which has a plant in the Western Isles. The Portuguese government believes that such is the promise of wave power, it will replace wind as the centrepiece of its renewable energy strategy.

WAG have missed out on the opportunity to exploit the strong waters of the Atlantic and Irish sea as is now being done by the South West Regional Development Agency (SWRDA). This has set up the Wavehub project off the north coast of Cornwall. This project is due for construction during the next year, with the first electricity being generated in late 2006. It is predicted to bring an estimated 700 jobs and £27 million a year to the South-West of England. Regrettably, WAG has also completely missed out on the opportunity for setting up a similar wave-power industry in Holyhead and Milford Haven.

The SWRDA has identified wave, tidal and biomass as having the greatest potential for the regional economy. It is reasonable to wonder why Wales, which resembles the South West in many respects, has developed such a very different energy strategy? Wales’ proximity to rough water means that a significant number of wave farms could be located off Milford Haven and Holyhead, where they could be readily linked to the grid. Assuming an installed capacity of 2,400 MW, and a load factor of 30%, these might generate 6.3 TWh, rather more than WAG’s 2010 target.

There are three significant differences between off-shore wind and wave power:

- Wave generators continue to generate no matter how rough the conditions get, unlike wind turbines which have to shut down in high winds. Water as an energy medium is far more powerful than air, about 60–70 times as much, so being able to continue to generate in the roughest conditions is a great advantage.
- Ocean swells continue for a long time after the wind has dropped, which should result in much smooth output declines.
- The wave-generating plant can be towed into a nearby harbour and serviced there.
5.4.9 Tidal power

The design of a 60 MW scheme for Swansea Bay is well advanced despite being delayed for four years. The company behind the project has planned a much larger scheme off Rhyl, which would have an installed capacity of 400 MW.

The southern coast of Wales enjoys the second greatest tidal range in the world. There is great potential to harness massive amounts of predictable energy. It is scandalous that a project to exploit this has been delayed. If the Swansea and Rhyl schemes were built, then with a load factor of 30% they would produce 1.2 TWh pa. In fact, it should be possible to install 1,500 MW of installed capacity ie production of 3.9 TWh per year.

Another type of tidal technology would exploit the very strong currents that flow past the UK coast. These could be harnessed by submarine turbines. A scheme for the Pentland Firth, off the north of Scotland could, it has been estimated, supply 50% of the Scottish demand. Wales also has strong currents off Pembrokeshire and the NW coast of Ynys Mon. Like any wave farm in the area these could be linked to the existing grid without the need for large extensions.

A combination of wave and tidal schemes might produce over 10 TWh p.a. which is significantly more than is allowed for in WAG’s 2020 target.

5.5 Conclusion

We believe that Wales’ renewable energy resources are very large. Leaving aside the marine technologies and biomass, they are on the whole best suited to micro-generation schemes.

PART 6: POTENTIAL FOR LOW-CARBON GENERATION IN WALES

6.1 Carbon sequestration

Wales still has very large reserves of coal. We welcome any development of carbon sequestration technology that results in coal being used with only minimal emission of CO₂. Sequestration would be not only of great advantage to Wales, but to countries such as China and India who have large reserves of coal but not much oil or gas. This technology, therefore, represents a massive export opportunity.

6.2 Hydrogen and fuel cells

Hydrogen can be made in very many different ways. As the most abundant matter in the universe it is not hard to find although it is more difficult to recover. In the long term it could be made by using electrolysis to split water molecules. It may be cheaper to use pond scum through the natural processes of bacteria. A company in Guildford D Hydrogen Solar D is very close to making commercially available a panel that uses sunlight to make H₂ from water. Hydrogen Solar has just been named company of the year by Scientific American.

In the short term, hydrogen can be recovered from all fossil fuels. A scheme for a 500 MW power station that is just starting in Scotland will extract the H₂ from natural gas and return CO₂ to the earth’s strata where it will enable even more natural gas to be recovered than would otherwise be the case. It will produce virtually no CO₂ emissions.

PART 7: THE WORLD CONTEXT

If the UK went to being a nil CO₂ producer, world levels of CO₂ production would reduce by 2.3%. The only way this figure can be significantly increased is for the UK to influence other countries. The best way to do this is to ensure that any energy strategy in the UK is commercially attractive to others, especially the emerging giant economies such as China, India, Russia and Brazil.

China has vast coal reserves so any economical and successful CO₂ sequestration technology would be of great interest to them, as it would to India.

Many developing nations have a large solar resource. Developing this market for Welsh companies would bring production costs down and thereby make their products more marketable in Wales and the UK.

While most developing countries have large urban populations for which centralised generation would be appropriate, they also have many people living in remote and often mountainous areas. Here, efficient micro-generation technology would be the appropriate solution.
PART 8: CONCLUSION

The first requirement is for the WAG to adopt an integrated energy policy that would promote the following:

— Reduced energy use.
— Reduced transport emissions.
— Planning for both centralised generation and decentralised micro-generation and CHP.
— A permanent and secure power supply by encouraging renewable energy technology that is effective and environmentally benign, and by developing low-carbon energy technologies that exploit our fossil fuel reserves.
— The removal of the ROC subsidy or at least its modification to benefit “firm” generating renewables.

We believe that with the correct energy saving programmes, and the use of appropriate renewable and low-carbon technology, Wales should be able to face the challenge of reducing CO2 emissions without industrialising its landscape or its shores. It should also, given the right government backing, be able to create new industries which could exploit the world markets in low carbon technology.

1 December 2005

WRITTEN EVIDENCE FROM RENEWABLE ENERGY FOUNDATION

INTRODUCTION

We are particularly mindful that the topic of renewable energy will assume for many an over-riding importance in the Select Committee’s inquiry, principally because of its bearing on global efforts to tackle climate change. However, misconceptions of the United Kingdom’s role in these global efforts are prevalent, and consequently the role of renewables itself tends to be incorrectly assessed. These misconceptions not only mitigate against successful climate change policy, but also against a successful long-term future for renewable energy. It is imperative, then, to be clear at the outset with regard to realities and practicalities.

The United Kingdom emits roughly 550 million tonnes of CO2 per year.1 This is roughly 2% of the global total of 24,000 million tonnes.2 It should be immediately apparent that the United Kingdom has no quantitative role in global climate change policy, but instead can contribute by:

— demonstrating and exporting good practice; and
— through providing an economically compelling example.

Rapid growth in the developing world further emphasises this point, and may be conveniently indexed via electricity. China is at present approximately five times the size of the UK electrically, with an installed capacity of roughly 357 GW, generating approximately 1,800 TWh.3 The UK has an installed capacity of roughly 74 GW and generates around 400 TWh per year. By 2020 it is estimated that China will need to generate some 11,000 TWh, with an installed capacity of approximately 2,400 GW.4 In other words, by 2020 China will have grown sixfold electrically and be some 30 times the size of the UK in this sector. While nuclear and hydro-electrical power will provide a considerable portion of this energy, the bulk is expected to come, necessarily, from coal and gas.

Seen against such backdrop, it is obvious that the United Kingdom climate change and energy policies will be at best futile unless they are economically attractive and sufficiently practical to induce emulation in China. Consequently, as we have emphasised in our 2005 Manifesto, it is essential to recognise that the goals of the 2003 Energy White Paper must be prioritised correctly, and this sequence may seem counterintuitive.

It is widely agreed that energy must demonstrate favourable credentials in a number of areas, and ideally should be:

— Secure.
— Reliable.
— Economical.
— Clean.
— Sustainable.

1 For latest emissions data see DEFRA: http://www.defra.gov.uk/environment/statistics/globatmos/gaemunece.htm
2 Current estimates can be obtained from the Energy Information Administration of the US Dept of Energy: http://eia.doe.gov/.
3 See International Energy Annual data on: http://www.eia.doe.gov/emeu/iea/
However, it should be noted that these are the qualities we wish to be characteristic of the overall energy portfolio. It is not enough that the various component technologies of our portfolio should demonstrate them individually; each technology must manifest these qualities in such a way that:

1. the ability of other technologies to deliver their benefits is not impaired, and
2. the value of the energy sector as a whole is not seriously compromised.

We suggest that the criteria should be arranged in the sequence given above, reflecting their priority and consequence. The logic of this sequence can be explained as follows:

- If security of the primary sources cannot be guaranteed, then reliability at the point of use is questionable.
- If security and reliability of supply are compromised, then our economy will be damaged.
- If our energy supplies are insecure, unreliable, and unaffordable we will be unable to maintain and develop the high technological economy necessary to support our social aims and control the emissions of a large urban and industrial society.
- If the energy system in its total sense is unclean, as is seen in the CIS countries and parts of the developing world, then our social aims will be compromised by ill health in our population.
- And finally, if we cannot achieve any of the foregoing aims, our overall energy policy will be unsustainable, and the well-being of the United Kingdom and its people will be poorly served in the short, medium, and longer term.

We emphasise that this sequencing and logic differs radically from that found in the Energy White Paper, which we believe is gravely and dangerously flawed. In particular we note that the White Paper foregrounds emissions abatement as the principal goal, and allows other goals to settle into subordinate positions in no particular order. In criticising this policy framework, the Renewable Energy Foundation is not suggesting that emissions abatement is unimportant, but, rather, that placing it centre-stage is likely to compromise our ability to reach other essential objectives.

From the above analysis we conclude that there is no necessary conflict between (1) configuring our energy policy to serve our own economic needs, and (2) fulfilling our international responsibilities in relation to climate change. Indeed, emphatically, if the energy policy promises economic disadvantage it will by the same token be ineffective as a climate change policy because it will fail to carry the developing world in the same direction. The importance of this conclusion cannot be underestimated, and we commend it to the committee as a founding principal on which sound analysis can proceed, and we believe it informs our further comments below.

In structuring these remarks we have followed the outline of the published Terms of Reference. Our purpose has been to comment briefly each of the issues, highlighting documents and information sources that, in our view, would be profitable reference points for the Select Committee.

1(a) UK Government policy in relation to the current and future energy needs of Wales

It is a matter for concern that the UK energy policy is not regionally tailored, and tends to regard the renewable energy resources of Scotland and Wales as common UK properties to be exploited at will. While the overall national good may be seen as having weight in this context, we would suggest that, particularly in regard to renewable energy resources, this breaches what should be a golden rule of sustainable development; namely, that a development should be beneficial to all parties at the relevant proximate level, and that distal benefits should not be invoked.

In our response to the Energy Wales: Route Map to A Clean, Low-Carbon and More Competitive Energy Future for Wales we discussed this matter in some detail, noting with great pleasure Andrew Davies’ remark on sustainable development:

> In its fullest meaning, sustainable development is a powerfully humanist concept centred on the needs of individuals, families and communities within the environment they inhabit.

We observed that it would be welcome, in the light of Mr Davies’ remarks, if policy were clearer in its emphasis on the need to ensure that renewable energy development delivered secure and certain local benefits. Too often, in our view, the sustainability of a development is justified in terms of its action at a distance. In the case of renewable energy this is usually described in terms of its mitigation of climate change. However, this is too simplistic a measure of sustainability, and fails to fulfil the spirit of Mr Davies’ admirable description or to encompass and substantiate benefits for the local community. The benefit of such a refinement of the concept is that it enables the necessary discrimination between proposals which are locally damaging, though with benefits at a global level, and developments which are beneficial at every level.

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Restating this: we may think of this problem in terms of three nested benefits.

- Rural contributions to Welsh energy needs.
- Welsh contributions to the UK’s energy needs.
- The UK’s contribution to global climate change policy.

As an axiom, or a Golden Rule, we may state that the Contributor at each level must benefit at that level. Thus, rural areas which host renewable energy developments must benefit at the rural, local, level. Wales will necessarily make a contribution to UK needs, but must benefit at its own level in addition to benefiting indirectly from the higher levels.

This method of evaluation would help to ensure that sustainable development is, in fact, “centred on the needs of individuals, families and communities”. With this in mind we recommended that the policy and the route map are revised to place community benefit at the centre of renewable energy development. We believe that this is most pertinent in relation to renewable energy developments, which have most to offer at a community level.

1(b) UK Government policy in relation to the current and future provision of energy in Wales

We have argued in our response to 1a above that the provision of energy in Wales should be seen more in terms of its relation to Welsh needs, and that this is particularly true of renewable energy developments, which are becoming dangerously disconnected from the general interest in Wales.

2. The relationship between the UK Government and the National Assembly for Wales—including the division of powers—on energy policy

It is our view that, bearing in mind the fact that renewable energy developments have most potential at local level, renewable energy is best and most tactfully handled by the National Assembly, in order to ensure that the Golden Rule of sustainability, outlined above, is observed.

However, in relation to the provision of policy for conventional energy we consider that it is at least arguable that the National Assembly should accept the need to work in partnership with central government. This would enable the National Assembly to retain influence and control, without shouldering the people of Wales with the very high costs of determining such policy.

3(a) The current and future portfolio of energy provision in Wales: Nuclear Energy

The Renewable Energy Foundation is neutral on the nuclear issue. We do however, judge, that a manifestly full and transparent public debate is required so that the UK and its people can reach a sound decision in prompt order, either to proceed with new nuclear stations on old sites, or to stabilise the conventional energy sector to ensure that there is appropriate investment in coal and gas with Carbon Capture and Sequestration (the only viable alternative to a nuclear component in the short and medium term), with as large a contribution from firm generating renewables such as biomass and tidal systems as is feasible.

3(b) The current and future portfolio of energy provision in Wales: Liquefied Natural Gas

The Renewable Energy Foundation was an early voice arguing against too heavy dependence on gas, noting that this distortion in the portfolio was a direct outcome of unrealistic expectations for renewables. We maintain our position on this issue, but recognise that LNG is a valuable element in the portfolio, if correctly scaled, and that there may be wealth-generation opportunities for Wales in handling its importation, though we note that there are safety concerns in regard to the vulnerable populated area around Milford Haven.

In relation to Carbon Capture and Sequestration (CCS) see below in our remarks on clean coal.

3(c) The current and future portfolio of energy provision in Wales: Clean Coal Technology

The Renewable Energy Foundation recognises that fossil fuels will necessarily continue to provide the bulk of energy for Wales, and the UK, for some time to come, and that even the most ardent proponents of renewables must show social responsibility and acknowledge this necessity as a reality. Ensuring that this fossil fuel is used efficiently and without emissions is therefore essential. We therefore have recommended Carbon Capture and Sequestration (CCS), particularly for Enhanced Oil Recovery, where possible. We would advise the Select Committee to interpret the reference to “Clean Coal” in this section to cover not only the fitting of Flue Gas Desulphurisation (the conventional understanding of the term “clean coal”), but also CCS.
Wales has remaining reserves of coal, and is a likely beneficiary of the now inevitable coal rebuild in the UK’s portfolio. Furthermore, Welsh manufacturing is a potential beneficiary from any export drive for CCS technology, to China for example.

We note also that the Select Committee may wish to seek expert advice on advanced methods for extracting Welsh coal resources, particularly the potential for Underground Gasification. World-leading technology is currently available in the UK, which also has particularly suitable geology.

3(d) The current and future portfolio of energy provision in Wales: Wind Farms

The Renewable Energy Foundation is a well-known and outspoken critic of the current policy’s over-dependence on wind energy. We refer the Select Committee to the many publications revealing evidence from Denmark and Germany that wind energy is at best a fuel saver, and offers only a very low “capacity credit” (the ability to replace “firm” capacity in the portfolio). We are aware that Mr Graham Sinden of the Oxford Environmental Change Institute is currently arguing that conditions in the UK are so different that European experience is irrelevant to the UK. These theoretical claims are tendentious, vague, and lack credibility when compared with the empirical experience of our European neighbours. We therefore urge the Select Committee to examine both the E.ON Netz 2005 report and the recent articles in Civil Engineering by Hugh Sharman.7

We have argued at length that the currently unbanded structure of the Renewables Obligation has resulted in an unbalanced investment scramble for the least capital intensive ticket to the revenue stream, regardless of the intrinsic value of the technology adopted. Wind power undoubtedly has something to offer, but current levels of proposed development, particularly in Scotland and Wales, are irrational, and do not constitute a wise use of scarce capital.

It is regrettable that the wind industry has been, to say the least, overenthusiastic in estimating the technology’s benefits, and has tended to greatly underestimate the difficulties of managing stochastic generators, and as a consequence has misled both policy makers and public alike. A good example of this is the unfortunately biased report of the Sustainable Development Commission, which has been described by one authoritative commentator as cheerleading boosterism for the wind industry.

REF has argued in favour of a revision of the Renewables Obligation to offer more to technologies which themselves have more to offer, and we are thinking principally of Biomass and Tidal energy, which are capable of firm generation, and we urge the Select Committee to pay particular attention to the influence of the Renewables Obligation on investment patterns in renewable energy, and to the way in which the RO has contributed to a destabilisation of the overall energy sector.

3(e) The current and future portfolio of energy provision in Wales: Biomass Energy

The potential in Wales for biomass energy sources, for transport, heat, and electricity is very considerable, and promises truly sustainable benefits. The current poor state of development is almost entirely the result of flaws in the Renewables Obligation, which has over-focused attention on the electricity sector, at the expense of transport fuels and heat, and penalised technologies such as biomass which though of high merit require high capital investment and expert planning.

3(f) The current and future portfolio of energy provision in Wales: Geothermal Energy

The true potential for geothermal energy in the UK, and in Wales is still unclear. REF’s position is that this technology deserves research funding, and should be treated with an open mind.

3(g) The current and future portfolio of energy provision in Wales: Tidal and Wave Energy

REF is sceptical with regard to wave energy, which resembles wind power by being stochastically intermittent in relation to patterns of demand. Furthermore, we are concerned that the strains on plant installed at the interface between air and water will be very considerable, shortening life-expectancy and increasing operation and maintenance costs. Nevertheless, an open mind is wise on this matter, and a number of demonstration plants are now in the process of testing.

With regard to tidal energy the situation is entirely different. Tidal energy is, other than biomass for electricity, far and away the most promising of all the renewable technologies. Tidal systems are intermittent, but extremely predictable, and their output can therefore be planned into the system with a high level of confidence far into the future, thus maximising utility. We believe that the failure to fully explore and incentivise tidal systems is perhaps the single greatest flaw in current policy viewed from a UK level perspective. From a Welsh perspective the failure to ensure that tidal energy projects are brought forward

borders on the disastrous. Wales has numerous, outstanding, tidal opportunities, both for tidal empoundments (lagoons as Tidal Electric Ltd call them) and for tidal stream devices. Such systems, if successful, could contribute meaningfully to Welsh energy needs, with “firm” power, while at the same time becoming an integral part of the Welsh economy.

3(h) The current and future portfolio of energy provision in Wales: Hydro-electric Energy

Opportunities for acceptable hydro-electric power are largely exhausted in Wales, and we are unconvinced that the balance between the impact and benefits of further projects would be favourable. We believe this is particularly so since extremely promising alternatives such as biomass and tidal systems have much to offer to Wales.

30 November 2005

Witnesses: Mr Robert Cottam, MBE, Chairman, Dr John Constable, Policy and Research Director and Mr Campbell Dunford, Chief Executive, Renewable Energy Foundation, and Mr Peter Southgate, Committee Representative North Wales, All Wales Energy Group, gave evidence.

Q662 Chairman: Welcome to the Welsh Affairs Committee. We have a very tight schedule; the Minister is coming at two o’clock, so we will try to get this session over by then. Can you tell us a little about your group, your aims and objectives, and how you interact with the National Assembly for Wales and the UK Government?

Mr Cottam: As Chairman, I will attempt to answer that question. However, can I say that I thank the Committee very much for asking us to attend and for giving us the opportunity to express our views on the research we have undertaken? The All Wales Energy Group was founded in 2004, initially in response to a need for factual, scientifically researched information applicable to the growing wind-farm debate. Both proponents and opponents often exaggerated sometimes claims regarding wind turbines and their efficiency or otherwise. Its membership is made of both individuals and groups who share a concern over global warming and the need for effective policies in the use of resources, which will result in significant reductions to greenhouse gases and their emissions. To this end, AWEG commissions research, publishes papers and circulates reports. Over 35 local groups from around Wales subscribe to membership, in addition to individual members. Most groups have a membership of over 100, which puts AWEG membership at well over 3,500. AWEG is affiliated to the national charity, the Renewable Energy Foundation, and it has a seat on the Foundation’s steering committee. AWEG has submitted numerous communications to the Welsh Assembly, its ministers, members and officers, including a presentation to the National Assembly’s Sustainable Energy Group. Since AWEG’s and the Renewable Energy Foundation’s written submission to the Welsh Affairs Committee’s inquiry into energy last November, there have occurred several notable developments, namely published research on the quantifiable carbon emission debt incurred in the construction of upland wind farms prior to operation, and the quantifiable absorption of CO2 by conifer plantations. Of most significance, following the gas crisis earlier in 2006, both in the UK and abroad, with Russia for example, has been the increasing emphasis on the need for security of energy supply. Finally, the DTI have now published outward data from wind turbine sites, which fall significantly below the British Wind Energy Association’s promises. That gives you a broad outline of what we are about.

Q663 Chairman: One question occurs to me. How do you relate to this newly-formed Welsh Energy Research Centre?

Mr Cottam: We do not relate at all. We have not been asked to contribute or help towards it.

Q664 Mr Jones: Where does your funding come from? I know you have the Foundation, but where does the Foundation funding come from?

Mr Cottam: It is a charity. I will ask Campbell to explain.

Mr Dunford: The Renewable Energy Foundation is a charity. All of our funding comes from private donation; we have no corporate funding or any individual interest at all. Our purpose is to commission and publish research into all forms of renewable energy to make data available to the media, to the administrators and to the public on all matters surrounding energy, wherever we can. To that extent we have liaised closely with AWEG, as we do with sister groups elsewhere in the country and in Scotland, for example.

Q665 Mr Jones: So individual donations.

Mr Dunford: Individual donations entirely.

Q666 Mr Jones: And you cannot name who they are!

Mr Dunford: Some of it is in the public domain. If you look at our accounts you will see, for example, that large benefactors include major land-owners; those who are successful industrialists; those who have been concerned about energy policy, the effect upon, in some cases obvious things like landscape; but more fundamentally, the availability and cost of energy to the UK economy and its well-being. If you would like me to give you individual names, I can do that.

Mr Jones: No, that is fine.
Q667 Albert Owen: You remind us in your written evidence that energy policy is not devolved to the National Assembly for Wales, and thereby you assume it has been dominated at a UK level. Can you explain to us how this works in practice?

Mr Cottam: There is a distinction between Wales and the national government. It is as if energy policy is formed at a national level but—

Q668 Albert Owen: You mean the UK?

Mr Cottam: Yes, but it gets affected in many ways by the devolved government. A clear indication that it can, unfortunately, is wind energy, where the form of renewable obligation certificates gives it quite a significant sum of money, raised from electricity consumers fundamentally; and yet the Welsh Assembly has no input on this. The renewable obligation certification system is a UK-Government decision. However, the Welsh Assembly disposes of policy because it is responsible for planning, so it has changed the planning guidelines to facilitate the implementation of the renewable obligation certificates and to accelerate their use. There is one example. Another example perhaps would be the DTI: it changes its research, or its facts and figures, in justifying decisions which it makes and recommends. For example, it was believed that wind energy had a carbon emission saving of 0.86 tonnes per megawatt hour, whereas the DTI might have thought that two or three years ago, but certainly two years recommended a carbon saving of 0.43 tonnes per megawatt hour, which is half. In other words, it came out two years ago, saying these wind turbines were half in carbon emission savings; yet when planning policy was implemented through TAN 8, still the 0.86 figure. There is necessarily a time delay, is there not, between legislature and the DTI and as it feeds through to the devolved government? That is just an example; there are other examples in other lines of inquiry.

Q669 Albert Owen: You have given some good examples, but as a group do you think there should be greater co-operation between different levels of government in the UK, or do you think energy should be devolved through the National Assembly for Wales?

Mr Cottam: It should be one or the other. I would quite like to see either.

Mr Dunford: The reality is that we are an island, and an island that is running out of energy of all sorts and forms. It is, in our view, something of a luxury to try and plan any form of energy, renewable, fossil or otherwise, totally in isolation. There are grid connections; there are fuel poverty implications, and you need an overview. Against that we would also say that as much should be done at a local level as possible because that is also healthy.

Q670 Albert Owen: You are advocating greater co-operation.

Mr Dunford: Indeed

Dr Constable: If I could refer the Committee to the Renewable Energy Foundation’s submission to your inquiry and to our paragraph 1(a) talking about UK Government policy in relation to current and future energy needs in Wales, we note that it is a matter of concern from our perspective that UK energy policy is not regionally tailored. It tends to regard renewable energy resources and others indeed, in Scotland and Wales for example, as common UK properties to be exploited at will. While we accept of course that the overall national good may be seen as having weight in this context, we are concerned that particularly in relation to renewable energy resources, this breaches what we take as a golden rule of sustainable development, which is that a development should be beneficial to all parties at the relevant proximate level; and that distal benefits—benefits at a distance—should not be invoked, or not invoked carelessly. In our response to the Energy Wales Route Map, for example, we discussed this in some detail, noting with great pleasure a remark by Andrew Davies on sustainable development. He wrote: “In its fullest meaning sustainable development is a powerfully humanist concept centred on the needs of individuals, families and communities within the environment they inhabit.” That is laudable. We observe that it would be welcome in the light of Mr Davies’s remarks, if policy were clearer in its emphasis on the need to ensure that renewable energy development delivered secure and certain local benefits, in addition to whatever distal benefits it might deliver.

Q671 Albert Owen: You mentioned the Welsh Assembly Government Energy Route Map, and your written submission focuses considerably on this, but you are quite critical of it. You claim that it fails to take a holistic and inclusive approach to energy policy. Can you explain what aspect you feel has been neglected from the Route Map?

Mr Southgate: It is incomplete. It left out transport, which is the sector with the fastest-growing emissions. It is no good thinking that the matter of electric generation is entirely separate issue to transport; it is not. It might be if you looked at it in a conventional way, but in terms of what is going on in the world at the moment, it jolly well is not. How on earth can you have a coherent policy when it leaves out one of its most important sectors? Another point is that because of what one can only describe as a bias that has grown over the last three years—and you can see it in the Assembly’s own documents—towards large-scale onshore wind, then you have an imbalanced view of what can be achieved by using other technologies. I have written I do not know how many letters to ministers, pointing out that we could have tidal generation and wave generation now. They keep saying, “It is going to be 10 years down the line”. I am getting this letter back from a minister, when wave turbines are being built in Scotland by a company that is half Welsh, Camcal. It is ludicrous. The commercial reality at the moment is that there is a whole raft of opportunities open to us. The real effect of Welsh Assembly policies is to hold this up because it has had such a blinkered view of what is available and what could be done.
Q672 Albert Owen: Thank you for that. You are clear that transport has been omitted and that there is a bias towards wind farms; but do you think the Route Map can influence the UK’s energy review?

Dr Constable: I have no doubt that remarks made in Wales in relation to Welsh potential will be highly significant to the NGT energy review. Peter mentioned tidal projects: Wales has unique access to tidal projects, and they certainly are available now. Korea is currently building the world’s largest tidal system in the Shihwa Bay; it is a 250-megawatt plant, and that is expected to be complete by 2009. This is immediately available. I suspect that if Wales were to take a proactive view on tidal energy, that would greatly reinforce those arguing strenuously for it in London, as many people are, as you must know.

Q673 Albert Owen: What would you like to see the Energy Review conclude? Obviously there should be more tidal instead of wind, from your perspective, but are you pro-nuclear, for instance?

Mr Dunford: We believe the first thing that must be done is that there should be a realistic understanding of what renewables can and cannot achieve. We believe that renewables have been hugely oversold in terms of people’s expectations, both in parliament and among the general public. Realistically, therefore, we need a renewables menu of things that are achievable now and which are applicable to Wales and the United Kingdom as a whole. Among those we would put tidal and solar high, much much higher than they currently are. We would certainly encourage micro-generation, which is a huge area that is virtually unexploited in this country at the moment, unlike other economies; and of course the one area that is hugely overlooked is energy-saving. As a country we pay lip service to it, but there is no co-ordinated attempt to deal with energy saving. We also come to conclude, though we are the Renewable Energy Foundation, that renewable energy by itself can only make a contribution to the energy needs of this country, and we need a very mature re-examination of the other sources of energy that are available to us. In particular we need to have a much better use of fossils. We have been spending a great deal of our time on what you can refer to, as the Chief Executive of Shell does, as the green fossil; that is to say to make better use of coal in particular. We have so much of it; it is a vastly under-utilised resource; and the technologies to make use of that in a clean, constructive and environmentally friendly way, exist. That is what we would like to see.

Dr Constable: I refer you to our formal submission to the Energy Review in which we lay out a number of criteria, which we would like to see more firmly applied in UK energy policy, particularly in relation to renewables. The main criterion is an emphasis less on gross energy and more on timely delivery; in other words on power rather than on energy in the technical sense; and thus on renewables that are capable of firm generation. We believe that lack of banding in the renewables obligation is a very serious flaw. I am pleased to see that this weakness is now quite widely acknowledged, and I draw your attention to a very interesting exchange between Mr Mark Lancaster, MP for north-east Milton Keynes, and the Energy Minister, Malcolm Wicks, on Thursday. Mr Lancaster asked: “Does the Minister agree that we need to reconsider the renewables obligation, which focuses on wind power to the detriment of other emerging technologies?” The Minister responded: “Yes, I agree that the renewables obligation, despite its strengths, which have brought forward much renewable energy, could appear to be a blunt instrument, and certainly seems to be favouring one technology. Within the review we are therefore considering the issue that the Honourable Gentleman raises.” That is very welcome indeed. We would like to see a broad spread, and we would like to see wind within reason, with much more emphasis on offshore wind. The BWEA published a long report recently indicating that offshore wind is in great difficulties—it is and we acknowledge that those difficulties require government intervention to ensure that they are overcome. Offshore wind does have a lot to offer: the load factors are high and it can be brought into close proximity to centres of load; and if combined, as we are now arguing, with storage technologies, it could offer a higher degree of capacity credit and possibly a degree of firm generation, if well designed. But it probably only makes sense offshore. The main emphasis I would like to see in the Energy Review in relation to the renewables obligation banding is to encourage firm generation from renewables, and overall much more concern with balance.

Q674 Nia Griffiths: Can you express your dissatisfaction with the current system of renewable obligation certificates, and can you say what you would like to see come through now from the DTI?

Dr Constable: The obligation is complex but, as the Minister says, it is a blunt instrument. It generates a very considerable revenue stream, approximately £1 billion a year, extracted indirectly from electricity bills. The system itself makes no distinction between the intrinsic merits of renewable technologies. Consequently investors have done what investors must do; they have sought the least capital-intensive ticket to the gravy train. There is nothing strange about that and nothing personal about it; it is just business. Initially that was landfill gas, which is a good technology. Perhaps it was somewhat over-rewarded under the RO, but it is firm generation and it was burning methane that would otherwise have been released to atmosphere. The next cheapest technology in the list is onshore wind. The problem is that all the investors have concentrated on that to the exclusion of others; so when Mr Lancaster asked whether it is damaging other technologies, we all now that it is because those technologies simply do not get attention from capital investors. Campbell and I meet these capital investors on a regular basis, and they say: “Would you do anything different?” I suppose we would have to be honest; we would not, would we, if we were sitting in their chairs? The system has to incentivise capital to move towards technologies that happen to be more capital-intensive and which have higher intrinsic merit, for example tidal and biomass.
Q675 Hywel Williams: Dr Constable, in reply to Mr Owen you referred to “appropriate proximal level” in terms of costs and benefits for decision-making. How would you define that? Is there a definition that you would favour?

Dr Constable: I would like to see the categories mentioned by Andrew Davies as receiving benefits, so families, individuals, possibly abstract units, but concrete individuals where it is equitably distributed between local communities, both in terms of income and also benefit. For example, in Denmark, biomass heating plants generally speaking not only generate electricity, if they do; but they provide district heating to local communities.

Q676 Hywel Williams: Mr Dunford, you listed wave, tidal, micro-generation, fossil developments, saving and conservation as parts of the energy mix. Are there any of those that you would like to add, and also crucially how should these technologies be best promoted by the Welsh Assembly Government and the DTI?

Mr Dunford: The other obvious additions, as Peter said, would be in the transport area and in the agricultural area; and we can enhance our security of supply, reduce our imports and improve the environment by accelerating the use of bio-fuels. For example, it is perfectly possible to supply 5% of the total UK petrol burn at the moment from the amount of wheat we currently dump on world markets. There is a surplus. It does not mean growing another acre of anything. We have not been doing it, and we have not been doing it because the companies that want to do it have not been able to get the capital because all the money from the city—and I am a banker—has been going to the fast route, I fear. There are 10 plants for anaerobic digestion installed per month in Germany on large farms to provide power for local villages and schools and that sort of thing. In this country the first one is struggling to get its planning permission in, as we speak. All of those things should be going forward now, if that answers your question.

Mr Southgate: Can I raise a point of clarification? Was your question just about renewables or about other technologies?

Q678 Hywel Williams: It was specifically about renewables.

Mr Southgate: Because there are other technologies, like carbon capture.

Q679 Hywel Williams: Would you care to elaborate very briefly?

Mr Dunford: On the question of coal, the last and obvious thing that should be considered and in the UK as a whole is underground coal gasification. This is the combusting of coal underground, the piping to the surface of the product gases, which you can then use for energy generation for any other purpose, and the harmful emissions can be siphoned off without it affecting the atmosphere. This is way beyond pilot stage in other countries. The Chinese have 16 such plants working already so there is no reason at all why it cannot be done here.

Q680 Chairman: Why is it not being developed?

Mr Dunford: That is an extremely good question. Dr Constable: It is being developed but not necessarily here in the UK. China and India have very active programmes in this regard.

Q681 Chairman: What is holding it up in the UK?

Dr Constable: I suspect it is also a question of the provision of anaerobic digestion power for local villages and schools and that sort of thing. In this country the first one is struggling to get its planning permission in, as we speak. All of those things should be going forward now, if that answers your question.

Q682 Hywel Williams: You highlight the need to develop a hydrogen infrastructure. Can you explain why, and again outline what measures could be taken by the DTI and the Welsh Assembly Government to promote this?

Dr Constable: Both AWEG and REF are positive about hydrogen economy, but we are also realistic about it. The truth is, as we realise by the American Government for a long time, that the hydrogen economy will only lift off where there is a surplus of renewable energy, or indeed surplus of carbon-free energy. At present the only country that has such surplus is Iceland. Nevertheless, it is highly desirable that we prepare for it and that we remain in the industry, and are therefore able to benefit from manufacturing opportunities within it. I would say that the investment should be therefore in a technical and not a quantitative sense, so we should be looking at hi-tech employment, not necessarily gross quantitative employment of hydrogen economy.

There is no point in developing broad-scale but utterly uneconomic hydrogen economy in the UK. As we say repeatedly in our documents, self harm in the United Kingdom would be a very poor
advertisement for clean energy globally—a very important principle, given that our capacity to provide a quantitative role in global climate change policy is close to zero. It has got to be qualitative. The Prime Minister’s recent statement Stop Climate Chaos makes this quite clear as well. I would say there should be hi-tech investment in university research, small-scale development of hydrogen economy to simulate manufacturing and showcase applications.

Q683 Mr Jones: What is the potential for solar power in the UK, both at the micro and the macro level, and what are the obstacles to achieving that potential?

Mr Cottam: We believe the potential for solar energy is very great in the UK. Sure, we do not have the climate of southern Mediterranean countries, but we do have sufficient sunshine. To give a quite obvious example, two years ago when I looked at incorporating solar panels into my house, the pay-off was 15 years; now the pay-off is less than eight years, and possibly falling. Also, not included in the figures, so it will be even less, is a system for increasing the efficiency of current solar panels by another 50%. Again, a Welsh firm has developed this, and I believe they have given it to an overseas European company to develop. This, again, will bring down the payback time in solar energy, so it makes financial economic sense for households to invest in it, because their life is about 35 years, according to the makers, and it certainly works. Of course it needs back-up over the winter period, but it can certainly save. Also, there has been a change in the kind of boilers that are available now, so solar heating can feed directly into a boiler and so can save on the central heating. Then of course, if we look around Cardiff, as we were talking this morning, the number of flat roofs and high buildings should be covered with solar panels.

Dr Constable: We regard solar thermal as possibly the most promising and under-exploited single resource in the domestic renewables sector, with the possible exception of ground-source heat pumps, which are slightly more limited in application. The UK has a housing stock of approximately 24 million houses. Solar thermal is currently economic, and with fossil fuel prices rising as they are, will become progressively more and more attractive. We are currently in negotiations with one of the UK’s largest domestic property owners, to encourage him to adopt on a broad scale as many of these practicable renewable energy technologies, not least because it offers an almost unique opportunity at which you can enhance the UK’s energy security and also tackle energy poverty with one blow. One of the problems with the energy White Paper is that it sets itself a broad range of tasks, which are very difficult to meet simultaneously. With solar thermal, you have a unique opportunity: you can cut people’s bills and you can reduce national fuel burn. Positive direct investment from government might be a very positive step indeed. The details remain to be worked out, but it is an extremely promising idea. I apologise for my voice, which is fading away at a rapid rate!

Q684 Mr Jones: You are of course talking about direct water heating and photovoltaics as well? Can you cover photovoltaics?

Dr Constable: Solar photovoltaic is interesting but it is of course capital intensive. I think that realistically with the degree of insulation present in the United Kingdom it is not something we should think of just now. Other countries—Japan for example where I lived for a number of years—take these things very seriously, and they seem to be making some progress. It is solar thermal for us in the first instance!

Mr Cottam: If you are going to use photovoltaic it has to be very near where it is going to be used. As you know, the farther away power stations are from where it is being consumed—so the photovoltaic is not a strong output per capital investment, but on top of buildings it can contribute if it is going to be used in that building.

Q685 Mr Jones: Micro-generation.

Mr Cottam: Yes.

Mr Southgate: We have an appendix on solar power.

Mr Cottam: I mentioned this in the submissions we made.

Mr Southgate: Did you all get copies of the appendix?

Mr Cottam: The green is solar energy, the red is wind, and you can see how solar completely outclasses—

Q686 Chairman: Can you supply us with that appendix, please?

Mr Cottam: Certainly.

Q687 Mr Jones: You have described biomass as “the most consistent and reliable power supply of all the renewables”. Can you tell us what potential there is for biomass in Wales?

Dr Constable: By “consistent” I presume that AWEG was indicating through firm generation; it is standard combustion technology so it shares all the merits of standard combustion technologies. We are currently encouraging a Danish company, because they have such expertise in this field, to develop a benchmark project in the north of England, which would be a significant quantity of electricity, somewhere around 10 megawatts, and a significant quantity of heat, somewhere around 14-15 megawatts. In a new industrial and housing development it will provide district heating both to domestic residences and to commercial and industrial locations. This would also provide an incentive for a large landowner to maintain in good health 7,000 acres of forestry, which currently is uneconomic, and the woods are decaying and failing. This is happening all over the UK. We believe biomass can offer real opportunities for generating firm energy locally, enforcing local grid, providing affordable heat, reducing consumption of hydrocarbons, and also providing an incentive for
sustainable forestry. The potential in Wales it would be difficult to quantify. I would refer you to the Defra biomass studies. Again, returning to the issue of scale, scale opportunities are sometimes a misleading figure. We are not really interested in scale; it is getting it right. It does not matter whether we have 5,000 megawatts of biomass or 2,000; the point is that it has got to look right economically.

Q688 Mr Jones: You mentioned ground-based heat pumps, but I do not think there is any mention of deep-drill geothermal. I know we are not exactly a hot-spot on the world’s crust, but a couple of kilometres down there it is very, very hot. Have you considered geothermal in the context of the UK?

Mr Dunford: Thank you for making the distinction. There is a clear distinction between ground-source heat and geothermal, and people confuse the two. We do think there is a lot of scope for ground-source heat of course. In regard to geothermal, we have been speaking with the Cambourne School of Mines, which is the UK’s centre of excellence, and where they have a team working across in France, where there is a significant amount of heat taken from the rocks. Their advice to us is that on the mainland UK there are very few economic sources. We are however—and this is a development in the last week—starting to look with some German experts at the possibilities of taking heat from the very large heated aquifers that are around in this country, but it is too early to say how much may come from that. We think that ground-source heat is a much quicker win, frankly.

Q689 Mr Jones: I am glad somebody is working on geothermal.

Mr Dunford: We have only just started.

Q690 Mark Williams: In your written evidence you make a very clear distinction between the large schemes—the Cefn Croes’s of this world—and smaller-scale wind energy projects. How do you feel that the UK and Assembly Government policy and planning regulations should reflect the distinction between the large-scale projects and the smaller ones?

Mr Cottam: This is reflected in the studies that AWEG commissioned. Again, I will send you a copy. The green is micro wind generation; the red is macro wind generation; and you can see how macro generation in the first year can be on a par, but it is so affordable and so more unique it is a lot better. You can see the green superior to the red. It is produced by a recognised scientist of distinguished repute. There are certainly advantages. Obstacles to planning—because you still have to apply for planning for small wind turbines, if you are putting them on buildings—should be eased. Certainly if you are easing them for major wind-farm generation you should make it even easier for small ones. That would be our recommendation.

Dr Constable: Our position is slightly different on this point. Planning theory is something of a hobby of mine—which is a rather sad thing to have to admit, is it not? The fundamental issue in all planning is the balance between benefit and disbenefit. I see little reason why government should interfere in that fundamental issue where it is decided at local level. What is needed is better guidance for local councillors when they have to make decisions. If there are needless bureaucratic obstacles in the way of micro-generation, then by all means remove them, but I would be sorry to see any interference in the fundamental consideration of the upsides and the downsides of any particular project. One has to remember that even small-scale wind turbines can be a problem for somebody next door, and there is no reason why that person should be disadvantaged within the system. I think clearer guidance is required; the Companion Guide to PPS22 is in some respects unsatisfactory and could be improved.

Mr Southgate: Can I add a rider to what has been said? What we have not discussed is back-up. Large-scale wind farms require back-up, and it is now generally accepted that that will have to be in the form of gas turbines. Small-scale projects do not need that back-up because they are small enough to accommodate the energy they generate in batteries, or, as in the case in Denmark, they can produce hot water, which can be stored in highly insulated tanks. The difference is between large-scale gas-fired wind turbines and the genuine small-scale wind turbines, and there is a huge difference. I would just like to make that point.

Q691 Nia Griffith: Some councils are looking at giving permitted development status to certain types of renewable new insulation on buildings. Do you have any good examples of those in Wales where it is working successfully?

Mr Cottam: All insulation measures are beneficial. There are lots of examples but I would not like to pick on one.

Q692 Nia Griffith: I know that the City and County of Swansea are being encouraged by a local firm to look at something, but I wondered if you knew of any councils that had a firm policy of permitted development for micro-generation equipment.

Mr Cottam: They are usually aid—for example—benefits to put roof insulation and this kind of thing in, but I am not aware of any council benefits say to a building company where—

Q693 Nia Griffith: I am talking about permitted development. It is a planning term; it is instead of having to go through the whole planning procedure, and there is an automatic acceptance that that is something which is allowed. That is what I was wondering, if you knew of any council in Wales that had that up and running.

Mr Cottam: I personally do not.

Mr Southgate: I have no knowledge of such planning policies, regrettably.

Q694 Mark Williams: In your evidence you mentioned in paragraph 5.49 that the DTI had removed its objections to the Swansea tidal lagoon
project. Can you indicate your perception of those objections, and what lessons can be learnt in future with other projects?

Mr Southgate: In fact there were two lines of disquiet. We did not address the financial one because we felt it had been adequately dealt with by the Chairman of Tidal Electric, Peter Ullman, who pointed out that the DTI had come to the conclusion that the Swansea scheme was going to be very expensive, and they had based that view on a much smaller scheme that had been costed by Tidal Electric in Alaska. It was a totally different scheme. It was far, far smaller and the tidal range was relatively tiny. In short, it had nothing to do with Swansea, and so we did not deal with that aspect because we thought that Peter Ullman had dealt with it. The main problem—and we were deeply disturbed by this—is that the DTI had used technical expertise which apparently was based on the design of a barrage for the Severn estuary; and therefore they were thinking that the specification for such a barrage would be very similar, to the specification of the embankments around a tidal lagoon. The international firm of engineers that designed the tidal lagoon, W.S. Atkins, put the DTI right in a meeting, which I believe was held on May 20th last year, or perhaps May 18th. As a result of W.S. Atkins’s explanation of the scheme, the DTI apparently agreed that they had been operating under a misapprehension and withdrew their technical objections. That is my understanding of what happened. Of course, it has done incredible damage to investor confidence. You can imagine somebody wanting to put money into this project and getting all these reports that (a) it is going to be too expensive, and (b) it does not work—it was just appalling.

Q695 Nia Griffith: What is your assessment?

Mr Southgate: As you probably know, there has been a recent proposal for a Severn barrage. Friends of the Earth Cymru have produced a really interesting paper comparing the benefits of that barrage with tidal lagoons. They have said they were going to get much better value for money with the lagoons—but that is their view. We have said that the Severn estuary tidal resource is the second greatest in the world, and it seems daft not to exploit it in one form or another.

Q696 Mark Williams: Is there an indication of differential in cost of those two things, the barrage versus the lagoons?

Mr Southgate: I would not be prepared to do that because you can appreciate that the costings are complicated. I can certainly let you have copies of the report I have read on the costings.

Mark Williams: That would be helpful, thank you.

Q697 Albert Owen: You mentioned that Swansea had nothing in common with an Alaskan project. Are there any projects in Europe that are successful, that are working and producing regular electricity to the grids, things that we can assess? Obviously, the Alaskan project was completely different.

Dr Constable: You mean a lagoon? No. There is a barrage of course at the River Rance.

Q698 Albert Owen: We are hearing in our inquiry lots of proposals for lagoons, but we have not seen or heard of a working model.

Dr Constable: No, they are untried. We are very interested in lagoons partly because while we recognise the 17 terawatt hours proposed for the Severn barrage is of national significance, it is certainly 4.5% of UK generation and does have an environmental impact which is contentious, and the mitigation of which is also contentious, but nevertheless it is undoubtedly. Lagoons might be a way of addressing part of that. We have examined Tidal Electric’s proposals and we have had informal discussions with our engineering advisers. They are interesting but they are untried.

Q699 Hywel Williams: If lagoons are being put up as an alternative to the barrage, how can one compare them? Can you compare them on a like-for-like basis if there is no evaluation of lagoons and no practical working example? Is it possible to say, “let us have one rather than the other”? It is a very broad question.

Dr Constable: If you were to read the MacAlpine proposal for the Severn barrage, you would find that it includes lagoons. They are proposing to put lagoons within the barrage enclosure to provide some degree of storage so that they could then sell at a very high black price on the market, providing peaking power, which would increase their income. I think it has to be faced that lagoons would not produce as much power as the larger Severn barrage, and that the cost per megawatt hour delivered might be higher than an overall Severn barrage. The Severn barrage proposal is in many respects very attractive from a national perspective. It is a very finely balanced and difficult debate. We have not yet stated opposition on it; we are still considering it.

Q700 Chairman: Can we end by asking you some questions on the role of the DTI and future developments. We note that in your written evidence you assert the necessity for what you call “the right Government backing to create new industries which could exploit the world markets in low carbon technology”. What precise policy, planning and financial backing is required of the DTI in order to achieve this?

Mr Dunford: The first and fundamental step that we believe is necessary to establish a healthy renewable and sustainable market is a revision of the subsidy system as operated by the ROC. We think that is a sine qua non. Otherwise, the market will remain distorted and whatever legislators say, funds will continue to go down to the route of least resistance; so that is the first thing. The second thing is that there should be a shading of the support available for technologies which inevitably take longer to come to market because of the capital deployed. Inevitably, it will take longer to deploy a tidal solution than it is to stick up a prefabricated wind turbine, for example. That needs looking at
therefore. The third thing is that we would like to see both energy conservation and micro-generation encouraged by the sort of blanket measures that we are frankly starting to try to pull together in the private sector, whereby individual households and communities, housing associations, estates of houses, for example, are rewarded for investment in micro-generation technologies—having solar panels on their roofs as well as putting in a better condensing boiler, or whatever that might be. At the moment it is totally piecemeal, and we do not believe that can be left entirely to the private sector—it will not happen—so that needs leadership. We are confident from our discussions with some of the largest landlords in the UK, as well as with some of the mortgage providers, that with a little bit of intelligent government help from the DTI this can be pulled together.

Dr Constable: The point about the Renewables Obligation is crucial: if the RO is not revised, then desirable changes will be frustrated; and the Minister’s remark, in response to Mr Lancaster’s question, shows that that awareness is now gaining ground in government, and I am very pleased about that. We would like to see, in addition to that reform, a more general attitude towards interventions in the market. At the moment we have an apparently free-market instrument, the RO, which is a blunt instrument intervention in the market. Intervening in markets is very difficult, and in principle we would like to see the Government intervene less in the markets and to do so only by removing the tax burden. We think that is a way in which domestic generation could be considerably enhanced. For example, we do not see why you should not remove tax completely. Whether you go down the German route and provide 100% subsidy for the installation of any of these is a further question, and the cost of that would be very high. We think it might be interesting, and possibly unnecessary. It is rather better simply to take the tax off and let canny consumers make decisions and weeded out those technologies that do benefit consumers.

Chairman: Thank you for your written and oral evidence; it was very clear and comprehensive. If you feel, in the light of questions posed to you today, that you wish to add a further memorandum, then we will be very pleased to receive it.

Supplementary Memorandum submitted by Campbell Dunford, CEO, Renewable Energy Foundation

May I begin by thanking you again for the opportunity to present evidence to the Welsh Affairs Select Committee during its visit to Cardiff on Monday, and for your courtesy.

You very kindly suggested that further relevant material might be passed to the Committee if it seemed likely to be of use. Accompanying this letter I am sending you a copy of the Renewable Energy Foundation’s response to the DTI’s Energy Review. Whilst this document discusses the UK situation in general, much of this theoretical overview (as found in the Summary of Response, pp 4–8) is of great significance for the Welsh case.

As Dr Constable and I tried to emphasise on Monday, the key issue is the revision of the Renewables Obligation to offer more to technologies which themselves have more to offer by virtue of their capacity for firm generation. If applied in Wales such technologies, for examples biomass and tidal systems, could offer genuinely sustainable benefits, with benefits at local as well as national level.

However, the current national framework, the RO, in fact limits scope within Wales, by causing an over-concentration on one technology which is now very widely known to be of low merit (on this latter point see particularly Professor Laughton’s remarks on p 32). We would draw the committee’s particular attention to Section 3 of our Response (pp 19ff), where we discuss the RO and its failings, and refer to a particularly interesting commentary by the European Commission.

Revision of the Obligation is perhaps the single most important beneficial action that Westminster could take in relation to encouraging a diverse and sustainable renewable energy future for Wales. Indeed, stabilisation in that area would have beneficial outcomes in the conventional sector, a matter which is of paramount importance.

As we said we believe that there is a resurgent future for the Welsh economy in the development of relevant, value added energy sources particularly based on micro generation, biomass and the sensible exploitation of clean coal technologies.

We would be very happy to answer any further questions that you might have.

10 June 2006
Further to our discussions I have pleasure in providing you with an outline of the Welsh Assembly Government’s role and relationship with the UK Government regarding energy policy in Wales for consideration by the Welsh Affairs Committee as part of its Inquiry into energy in Wales.

In February 2003 through my Energy Statement I set out the Assembly Government’s energy policy which together with the Sustainable Development Plan and Energy Saving Wales our energy efficiency action plan, both published in October 2004, underpins the UK Government’s Energy White Paper. Our energy policy has five important strands.

1. Greater energy efficiency, including small scale on-site chp and renewables, in our domestic, business and public sectors, working in partnership with local authorities.

2. A strong drive in Wales, against appropriate benchmarks, for a sustainable mix of renewable energy developments. Our aim is to secure 4 TWH of renewable energy production by 2010 and 7 TWH by 2020.

3. Encouraging energy infrastructure improvements.

4. The production in Wales of electricity from new clean coal power stations.

5. The setting of achievable and measurable carbon dioxide reduction targets for 2020.

On 20 June 2005, I launched for consultation the Welsh Energy Route Map, which sets out a wide range of actions which puts Wales at the forefront of clean energy production and energy efficiency. The Assembly through a plenary debate, on 9 November 2005, approved the Route Map.

Energy Policy is principally a reserved matter, however there are functions relating to energy policy such as planning and environmental, sustainable development and economic development that are devolved.

The Assembly Government is responsible for formulating non-statutory planning policy and guidance in relation to Wales. We published in July 2005 planning guidance, Technical Advice Note 8; planning for Renewable Energy, that is intended to facilitate the development of renewable energy to meet our targets to 2010.

In addition the Assembly Government exercises Town and Country Planning Act 1990 powers in Wales including those relating to planning policy: applications for planning consent for onshore generating stations in Wales up to 50MW (megawatts) or less rests with local planning authorities in Wales. This means the Assembly Government has the power to call in those applications and determines appeals against local planning authorities. However, the Assembly has no formal role in applications for the approval, construction, extension and operation of generating power stations over 50MW under Section 36 and Section 37 of the Electricity Act 1989.

In 2003, we formally requested a transfer of these powers and a Tripartite Working Group of officials from the Welsh Assembly Government, the Wales Office and the Department of Trade and Industry are continuing to consider the matter.

In respect of offshore generating station within Welsh waters, (out to 12Nm) the Assembly Government is the authorising body for applications made under the Transport and Works Act 1992 and the Food and Environment Protection Act 1985.

I hope that the Committee will find this outline to be an informative contribution and I look forward to discussing it further with you and members of the Committee.

19 December 2005

Written Evidence from the Welsh Assembly Government

INTRODUCTION

1. Devolution is still a comparatively new concept in the development of UK policy-making. It represents a sea-change in the way policy is evolved and implemented. At the same time it offers great opportunities for the making of policies which are highly relevant to the different parts of the United Kingdom through strong partnerships between Westminster, devolved administrations, local government and the private sector. It is only on this basis that a genuine pan-UK energy policy can be devised and achieved.

2. The Assembly Government has considerable power to develop and implement policy across a range of areas. These include agriculture, economic development, transport, education, the environment, health, housing, local government and town and country planning.
Wales Energy Policy/Welsh Assembly Government Strategies

3. The Wales Energy Route Map, published for consultation in September 2005, building on the Welsh energy strategy we published in 2003 in conjunction with the UK energy white paper, is the latest Welsh Assembly Government’s energy policy document. It highlights that the challenges facing energy policy are acute—not least the preservation of our international competitiveness, tackling fuel poverty and the truly global issue of climate change—and that the challenges can only be tackled through concerted worldwide, national and regional actions. Energy must be produced safely, securely and reliably; it must be affordable and competitively priced while causing minimal environmental impact and be used as efficiently as possible.

4. Currently, across the UK we have seen the sharp rise in electricity and gas prices with the UK becoming a net importer of gas sooner than expected. Large-scale offshore wind projects are proving more problematic to bring into operation than expected, making the scale of the challenge to meet the UK’s Kyoto targets for the reduction in carbon-dioxide emissions ever more apparent. At the same time there has been the launch of a wide range of major UK wide studies including: the Stern review of climate change economics; the DEFRA-led climate change programme review; Treasury-led consultation on barriers to wide-scale commercial deployment of carbon capture and storage; the Eddington study of transport and economic growth; the Barker review of land-use planning; the ODPM review of measures to reduce emissions from existing building stock, and the DTI Review of microgeneration prospects—all of which are expected to be relevant to developments in Wales.

5. At the European level, EU innovation, environmental and energy policies—particularly the Carbon Emissions Trading Scheme—if implemented uniformly and fairly in all Member states are fundamental to meeting our goals and should provide enabling mechanisms to allow business to adapt to new environmental standards in a way that protects jobs and offers economic opportunities.

The UK already has the most competitive energy market of all EU and G8 countries. Wales, as part of the UK, is committed to a market-based approach which delivers both our energy and economic development objectives, ensuring secure and affordable energy supplies and attaining much greater energy efficiency.

6. At the global level, there is the imperative of addressing climate change through meeting carbon dioxide reduction targets. In Wales, as in the UK as a whole, this will primarily be achieved in the short to medium term through an increased role for highly efficient fossil fuel stations and renewables in the energy mix as well as greater emphasis on energy efficiency.

7. There is the growing perception that as this century progresses there may be a continuing major supply-demand imbalance with oil and gas supplies. Problems associated with high energy prices and concerns over future security of supply are already high profile. A key objective for the next EU Structural Fund Programmes in Wales, proposals which are currently being drafted, will be to support the development of clean energy, energy conservation and efficient use of energy by industry, business, public bodies and house holders.

8. Addressing energy needs and energy consumption, as well as identifying economic opportunity remains at the heart of the holistic and strategic approach sought by the Welsh Assembly Government. Particular attention is drawn to our new economic strategy “Wales: A Vibrant Economy” (WAVE) which generally encourages partnership across public, academic and private sectors and also highlights the importance of facilitating investment in clean and renewable forms of energy generation. Coupled with support and advice on energy efficiency and energy R&D, these should provide enhanced economic opportunities. These objectives are further strengthened by our proposed Wales science policy—in which one of the key three themes is the pursuit of low carbon energy technology developments—and the Wales Sustainable Development and Environment Strategy action plans: included within the top commitments of which is an aim to encourage the development of stronger indigenous microgeneration renewable energy industry in Wales, placing particular focus on opportunities for small and medium-sized enterprises. The purpose of such strategic goals is also to help Wales focus and respond to the challenges and threats posed by climate change.

Energy Background/Welsh Scene

9. Because of our geography and industrial structure, Wales’ energy challenges and opportunities are highly distinctive. Wales’ seas and estuaries offer great opportunities for marine renewables, and Wales has a much larger manufacturing sector than the UK average, with a strong heavy industry component, so access to large quantities of affordable, reliable energy is especially important for the Welsh economy.

10. Although Wales is a net exporter of electricity, there is a significant north-south divide in energy generation. We export electricity from the concentration of generating stations in north Wales while in south Wales we currently import a significant proportion of our power needs. Consequently, because of transmission costs, south Wales’ consumers pay some of the highest electricity prices in Great Britain. In terms of energy infrastructure, there are currently issues surrounding the limited gas supply in mid and south
west Wales. Although in the south-west, the superb deep water facilities at Milford Haven are enabling the massive LNG-import related developments. There is also a relatively poor electricity transmission infrastructure in mid Wales which needs to be corrected to enable the desired large windfarm developments in our strategic search areas as carefully defined in the Welsh Assembly Government’s Technical Advice Note number 8.

11. Energy costs to UK industry are now among the highest in the EU. Welsh manufacturers have voiced their concern that if this continues they will become uncompetitive. High UK energy prices have a disproportionately large impact on Wales as we, along with the north-east of England, have a larger proportion of heavy industry than other parts of UK. South Wales already pays the highest UK domestic electricity prices, though this situation may ease as more generation comes on line as a result of proposed new power station build.

12. We believe that significant elements of the Welsh economy could be damaged if the relentless unilateral rise in energy costs continues unabated. We applaud the UK Government’s commitment to achieving liberalised energy markets across the EU and urge Government to look at innovative solutions to the problems of large energy users during what may be a long transition to liberalised markets across the EU.

CURRENT WALES ENERGY POLICY

Strategic Themes

13. Welsh energy policy currently has five important strategic strands.
   (i) Securing 4TWh per annum of renewable electricity production by 2010 and 7TWh by 2020;
   (ii) Driving much greater energy efficiency in all sectors, as described in our “Energy Savings Wales”
        energy efficiency action plan published in October 2004;
   (iii) Pursuing more electricity generation from cleaner, higher efficiency fossil-fuel plants;
   (iv) Stimulating significant energy infrastructure improvements; and
   (v) On a holistic basis, achieving measurable carbon dioxide emission reduction targets for 2020.

14. There is also on-going discussion with the UK Government about the transfer to the Welsh Assembly
    Government of large power station consents and associated powers under sections 36 and 37 of the
    Electricity Act 1989. All other planning processes have been devolved to the Assembly Government which
    makes the current situation for large power station consents, both on-shore and off-shore highly anomalous.

Wales Energy Route Map

15. Our detailed policy aspirations are highlighted in the Wales Energy Route Map (http://
    www.wales.gov.uk/subtradeindustry/content/consultations/ewrm-map-e.pdf) which has been through its
    main consultation stage. Further discussions on this took place with our main energy users, producers and
    stakeholders at an energy summit jointly chaired by the First Minister and Minister for Enterprise,
    Innovation and Networks in December 2005. The key message from the summit was the strong support for
    the main thrust of Assembly Government energy policy with a desire for increased emphasis on alternative
    renewable technologies, such as wave and tidal power, and a desire to see clarification of our position on
    nuclear power. The Route Map will be finalised after the initial report of the UK Energy Review. We expect
    the latter to emphasise the principles of the pursuit of diversity and strong private/public sector partnerships
    since the only way to minimise the risk of energy supply disruptions is through diversity of energy supply.
    Also the Review must recognise that the latter will only be achieved if there is in long-term investor
    confidence in each of the diverse components. Further, to fit together successfully the complex energy jigsaw
    this diversity creates, requires a strong private/public (Whitehall, Assembly Government, local authority
    and, in some cases, European Commission) partnership. These partnerships will only succeed if there is a
    clear vision and common purpose.

Key Wales Options

16. The quest for affordable, safe, secure and sufficient supplies of energy for the last 100 years has been
    a major risk-management exercise. As implied by the UK energy review consultation document, the
    management of risk is becoming increasingly complex and the importance of pursuing diversity is becoming
    ever more apparent. Looking forward, there is a wide range of options which might be pursued in the short,
    medium and long term. In Wales, the medium/long term options which are of greatest interest include the
    following.
(i) **Renewable energy**

The pursuit of renewable energy production both at the large scale and through microgeneration at the individual building level is a priority. Whilst wind energy, especially that based on-shore, is currently the most commercially attractive, bio-mass energy (including that from waste) and marine (tidal and wave) renewables in Wales have considerable potential and are currently being supported through the use of EU Structural Funds. In the longer term, solar photo-voltaic systems may have an enormous impact.

We have set targets for renewable energy generation of 4TWh to 2010 and 7TWh to 2020. The planning system has a crucial role to play in facilitating the delivery of renewable energy. To help achieve this ambitious target, the Welsh Assembly Government published in July 2005 Technical Advice Note 8 (TAN 8) which is a step change in national planning guidance. TAN 8 is intended to facilitate the measured development of renewable energy in the most appropriate locations and to provide surety and clarity to developers and local authorities. Of particular importance, TAN 8 sets out seven Strategic Search Areas (SSAs) which, subject to possible minor local refinement, are considered suitable for the location of large wind-farms—the installation of which will help us meet our 2010 renewables target.

Offshore wind-farms suitably located either in small-scale clusters a reasonable distance off-shore (as with North Hoyle), or large wind-farms situated far enough off-shore not to dominate much of the visible horizon, present opportunities for clean energy generation from the marine environment. However, economic uncertainty continues to surround this technology and we do not see new off-shore wind-farms making a large contribution to our 2010, 4TWhr target.

Our renewables objectives embrace far more than wind-power. We want to see a wide range of other technologies developed both at the large and small scale. We are making progress on biomass—especially in locally supplied heating systems for public sector buildings such as schools, leisure centres and the new Welsh Assembly building—and with wave and tidal systems utilising EU Structural Funds support. In addition we already have substantial hydro power/pumped storage systems with a limited potential for more.

The growth and use of energy-related bio-mass, with its capacity to produce heat, electricity, vehicle fuels and new chemical food-stocks, underpinned by the world class technology resource at IGER, the Institute of Grassland Research at Aberystwyth, could provide significant opportunities in Wales. Although the potential production volumes may be limited because of land availability considerations, bio-mass whether in the form of waste, forestry wood, energy and chemical food-stock crops, offers energy diversity and storage; low-carbon electricity; heat and transport (with relatively predictable future costs); alongside agricultural diversity; supply chain and research opportunities. This is an area where the energy requirements of the public sector in Wales could facilitate confidence in associated agricultural investments. We are currently exploring these complex issues in preparation for publishing a Wales energy-biomass strategy.

(ii) **A Severn Barrage**

There is an exceptional opportunity presented by building the Severn Barrage between Lavernock and Brean Down. Whilst costing £10 billion plus on current estimates and raising many local but serious environmental issues, the barrage would be equivalent to two nuclear power stations operating continuously, lasting not 40–50 years with a problematic legacy but operating for 150 years plus. Throughout its life the barrage would produce zero-carbon electricity on a totally predictable, low-cost and reliable basis, which may have considerable long term financial investment attractions in the present economic climate. Whilst not strictly conserving the existing environmental regime (which in any case will be disturbed by increasing global warming effects) it may have the potential, as has been demonstrated by the tidal barrage at La Rance, to significantly enhance the biodiversity of the Severn Estuary as well as providing further flood defences as the effects of increasing global warming come into play. While the construction of any barrage would require overcoming some very significant European Commission driven environmental legislation constraints, the Welsh Assembly Government and the South West England Regional Assembly now consider it appropriate to re-examine the Severn barrage proposals in depth.

(iii) **Clean fossil fuel-sourced power**

Coal-fired power generation is an integral part of Assembly Government energy policy and the Welsh energy mix. RWE Aberthaw power station provides most of the electricity in south Wales and is investing heavily in clean coal, FGD technology and biomass co-firing opportunities. Uskmouth power station is one of the cleanest coal plants in the UK. RWE at Aberthaw is expecting to burn 3million tonnes of coal a year post-FGD installation. There is the potential, with appropriate support, for at least half of the coal used to be of Welsh origin.
About 1,000 people are directly employed in the Welsh coal industry in a ratio of 60/40 open-cast to deep mines. Tower colliery now employs just over 400 and is due to close within two years. Even allowing for likely closures, with possible new mine developments, employment levels in the industry may be stable for many years ahead. The open-cast industry carries out a large amount of land restoration work each year which would otherwise be left unrestored, or would have to be restored at the cost of many millions of pounds at public funds.

Consultation has just ended on a new Welsh Assembly Government Technical Advice Note (TAN) on coal extraction. This proposes a 350 metre buffer zone around all new open-cast coal developments. We believe this will offer a degree of protection to homes near these sites while still providing sufficient scope for the production of open-cast coal, most of which is used in Wales for power generation. This TAN also looks to secure sites of potential future coal extraction which is especially important in relation to transport restrictions for the import of coal into Wales and also in relation to retaining the economic value added in the communities concerned.

New high-efficiency coal and gas sourced, and carbon capture and storage (CCS) technologies, could greatly assist us in fulfilling the Welsh Assembly Government’s sustainable development duties if applied in Wales, although these technologies will be developed on the world stage. There is no doubt that large-scale fossil-fuelled stations will remain the mainstay of electricity production in Wales for the next 20 years-plus and therefore pursuing these opportunities at the research, demonstration and full commercial levels should be a high priority. The growing interest of large energy companies such as BP, EoN and RWE, as demonstrated by various proposals for demonstrating low carbon emission, fossil fuelled plants in conjunction with carbon dioxide storage, is reassuring and we would welcome similar demonstration projects in Wales.

Also attractive are other new technologies for extracting energy from underground coal reserves, which, if combined with carbon capture and storage, could create a major indigenous Wales and UK low carbon energy source. In the short-to-medium term, supplementing conventional coal extraction methods, there is some energy generation potential from coal bed methane and enhanced coal bed methane projects. In the long term, there are enormous deep coal reserves (both on- and off-shore) in the UK from which energy could be extracted by gasifying the coal in situ (underground coal gasification - UGC) and we commend the DTI to build on its considerable previous work in this area.

(iv) Nuclear

Nuclear, both fission in the medium term and fusion in the long term, could play a strong role in the pursuit of diversity and low carbon electricity production but, from the risk management perspective, as detailed in recent Sustainable Development Commission and Select Committee reports, these technologies bring other issues into play. These include dealing with the very long-term radioactive waste legacy, nuclear weapon-material proliferation concerns and the risk, low but not zero, of accidents or terrorist actions.

We are aware that these issues are being explored, along with the estimates of true economic cost, in the UK Energy Review, the findings of which we await with interest. However, at the moment based on existing knowledge as discussed in the 2003 UK Energy Review, we believe that sufficient other new non-nuclear electricity generation will come on stream in Wales over the next 10–15 years to make the pursuit of new nuclear build unnecessary from our medium term perspective. We do, however, recognise the importance on a shorter timescale of the continuation of the existing Wylfa nuclear power station, especially in respect of its synergy with the nearby Anglesey Aluminium Metals operation. We appreciate that the issues surrounding the extension of the life of Wylfa are currently being re-examined by the Nuclear Decommissioning Authority in conjunction with DTI. We are also concerned, as flagged in the recent Environmental Audit Select Committee report, that any Government support for new nuclear build might de-stable investor confidence in other electricity production systems.

(v) Technology/Research and Development

The recent Wales science policy consultation (http://www.wales.gov.uk/substradeindustry/content/consultations/science—priorities-e.pdf) highlights in some detail the large scale energy, microgeneration and energy-efficiency technology opportunities in Wales. A Wales Energy Research Centre has already been created following an initiative by the Assembly Government and is working in partnership with the UK energy research centre. In addition Wales has recently joined the UK energy research partnership under the chairmanship of Paul Golby and David King and we would hope to play a part in the proposed new National Energy Research Institute. As with current EU Structural Fund programmes in Wales, we expect to be able to utilise any new Structural Funds (2007–2015) programmes in Wales to support energy related innovations, working closely with the UK Research Councils, DTI, DEFRA and the European Commission.
(vi) *Energy Conservation/Efficiency/Microgeneration*

There are three significant issues in considering the energy conservation and efficiency agenda:

(i) building and process energy conservation measures;
(ii) the installation in buildings of microgeneration (especially non-fossil fuel driven systems); and
(iii) the use of highly fuel-efficient vehicles.

All have the attraction of reducing energy demand, and thus energy costs and related emissions, and simultaneously decreasing the vulnerability from the disruption of conventional oil, electricity and gas supplies.

Whilst the programme outlined in Energy Saving Wales, and the establishment of the associated internet portal, provides a sound base for the pursuit of energy conservation, we accept that, alongside programmes such as the Home Energy Efficiency Scheme and the activities of the Carbon Trust and Energy Saving Trust in Wales, more needs to be done. We, working with local authorities and others, need to help ensure that there are many more champions active in assisting the people in Wales to understand better the importance of conserving energy and minimising carbon emissions and to know about the remedies available, both now and under development.

As regards microgeneration, as well as overcoming the public-resistance issues, in many instances significant further technology developments are required to enable large-scale deployment. A new Wales microgeneration strategy is under consultation alongside the associated DTI plan. We are looking for the most effective ways of:

— raising public awareness and knowledge;
— increasing the capacity of installation businesses and easing the installation process;
— further developing a microgeneration sector in Wales, and
— encouraging relevant technology developments.

Policies which might enhance a more environmentally friendly transport system are under review.

**The Way Ahead in Wales**

17. Looking forward, the final version of the Wales Energy Route Map will be produced after taking careful note of the findings from the UK Energy Review. Following the finalisation of the Route Map, we will be establishing a series of industry-led fora where energy specialists and stakeholders will help advise on and guide future Welsh Assembly Government energy policy. There is a substantial pool of expertise in Wales and we see the development of a strong cross-sector dialogue as key to the successful development of our ambitious energy agenda for Wales. We would also expect these fora to participate in UK-wide debates.

18. In addition, the merger of the Welsh Development Agency into the Welsh Assembly Government has established a core Energy Wales strategy team which has been created within the new Assembly Government Department of Enterprise, Innovation and Networks (DEIN) and an integrated regional energy-project support approach within DEIN is being developed. On the wider canvass, close working will take place between the new DEIN and other relevant Welsh Assembly Government departments, including the Department for Environment, Planning and Countryside, and the Spatial Plan strategic support teams.

**Desired Outcomes from the UK Energy Review**

19. Against the background described in this paper, the Welsh Assembly Government believes that the UK energy review should carefully consider:

(i) the importance of private/public partnerships in achieving the UK’s energy and energy efficiency goals;
(ii) correcting the anomaly of some of the Electricity Act 1989 etc. powers continuing to be reserved to the UK Government and not being devolved to Wales;
(iii) ensuring highly energy intensive industrial plants in the UK are not made internationally uncompetitive through energy price rises which are not reflected on the global scene;
(iv) the need for the pursuit of diversity in fuel sources and electricity supply including:

— ensuring that the long-term confidence of the energy industry and the financial communities is maintained to enable the necessary investment in a diverse range of energy sources;
— studying the tremendous long-term opportunities for 17TWh per annum of effectively zero-carbon energy from a Severn Barrage scheme;
— enabling on a UK-wide basis, the construction of high efficiency “clean-coal” power stations, in conjunction with long-term carbon capture and storage for fossil-fuel power stations, with as much coal as possible being sourced from indigenous mines;
— continuing strong support for renewable technology installations both for microgeneration systems, large scale wave and tidal stream, photovoltaics and advanced biomass- (energy crops) fuelled plants;
— safely extending the life of existing nuclear power stations to maximise the use of this already defrayed investment; and
— continuing strong support for the development and exploitation of new low-carbon technologies especially those with great long-term potential including UGC (underground coal gasification) in combination with carbon capture and storage.

(v) seeking a more holistic, powerful and effective approach to the implementation of energy efficiency measures of all types and in all sectors, utilising to the maximum, available government levers including Whitehall support for the Carbon Trust.

24 April 2006

Witnesses: Andrew Davies, AM, Minister for Enterprise, Innovation and Networks, and Dr Ron Loveland, Director of Energy Wales, Welsh Assembly Government, gave evidence.

Q701 Chairman: Welcome to the Welsh Affairs Committee. Minister, we do know you, but for the record could you introduce yourself and your colleague?

Andrew Davies: Andrew Davies, Minister for Enterprise, Innovation and Networks, the name of my new department. I am accompanied by Dr Ron Loveland, who is the Chief Technology Officer for the Welsh Assembly Government, but who also heads up, a director, of Energy Wales, the new department set up to take forward any development of energy policy. Behind are Lynn Griffiths and Alan James, also of Energy Wales, and also the Office of the Chief Technology Officer.

Q702 Chairman: In July last year you published the Wales Energy Route Map for consultation. Are you in a position to tell us the main outcomes of that consultation?

Andrew Davies: I think it is broadly supportive of the approach about a broad mix of technologies taken forward in terms of energy production. Certainly our view, in terms of how we meet our energy production needs in the future, based on growing demand for energy, is very much the same challenge that the UK Government has identified in terms of its energy review, but also taking into account our almost unique duty to promote sustainable development and increasing emphasis on those energy-production methods which reduce our environmental impact.

Dr Loveland: Normally, we would by now have produced a finalised version of the Energy Route Map but that obviously awaits the outcome of the current UK energy review. There was also a summit meeting that was chaired jointly by Andrew Davies and the First Minister, which very much ratified the views expressed in the Energy Route Map but asked for more emphasis on marine renewables and coal, and a clarification of our position on nuclear.

Q703 Chairman: Do you think that the Route Map will be able to influence the UK energy review? I am struck by your remarks about the impact of democratic devolution on these matters. The Chancellor in recent times has remarked on the way in which we should move away from a model of the periphery and centre, and that devolution should be about some kind of sense of equality between the so-called periphery and the centre.

Andrew Davies: Obviously, in terms of our powers, energy policy as such is non-devolved. However, we are very much part of the UK energy production and energy grid. While Wales is a net exporter of energy production, in North Wales we are an exporter, whereas in South Wales we are a net importer. That is one of the reasons why energy prices in South Wales are some of the highest in the UK: so we are very much part of the UK policy context as well as part of the energy production system in the UK. There are some elements where we have a very strong interest and we do have powers, for example in terms of planning of power stations. We are part of the planning process, except of course under sections 36 and 37 of the Electricity Act, where any power station over 50 megawatt is a matter for, on the one hand, the relevant local authority, or the UK Government through DTI. We see ourselves as very much part of the UK. That is why we are playing a very full part in the energy review, but within that we have, we felt, our own distinct needs and requirements in Wales, not least of which are our commitment to sustainable development.

Q704 Albert Owen: Dr Loveland mentioned awaiting the outcome of the energy review, and obviously you want an integrated UK level, as well as having some devolved powers. How do you think your submissions will influence the outcome; and if the outcomes are different are you likely to listen to the energy review and go back out for consultation or just take on board those decisions?

Andrew Davies: Clearly, the lead on this is the UK Government, the DTI. We will obviously seek to influence that. For example, as members will be aware, we have argued very strongly that the Severn tidal barrage should be seriously considered, and we have continued to make that point, the First Minister and I, both in written submissions and also meetings we have had with DTI ministers. We have made the case that it should seriously be considered because obviously of its capacity to generate over 5% of the UK’s total energy needs. There are therefore
specific areas within the review where we think we have expertise, or potential that we can exploit. Clearly, we are within the UK Government’s remit, and there is no way we can declare UDI. Clearly, we would have to work within that UK policy, but at the same time seek to influence that.

Q705 Mr Jones: Minister, in your paper you argue for a holistic approach to energy production in Wales, but we do have a predominance of wind power in Wales. What do you think needs to be done to get an appropriate level of diversity in energy production?

Andrew Davies: I would not say we have a predominance of wind power. Certainly in terms of renewable energy at the moment, by far the most commercially exploitable form of renewable energy or green energy is indeed onshore wind. Obviously, we have the first offshore wind farm in the UK, but there are still big issues around offshore wind. Certainly onshore is by far the form of renewable energy production that is most exploitable commercially in Wales. Our judgment is that hydroelectricity has probably reached its maximum in terms of significant development, but clearly there is a role for community hydro schemes. The First Minister, as I am sure you are aware, opened a community scheme in Talybont-on-Usk only a few weeks ago. We think there is significant development potential for biomass, again on a community level, although we understand there are significant proposals for larger biomass development, particularly in and around some of our major ports. We think there is scope in the medium term for marine technologies, whether that be tidal, tidal stream or indeed wave—and the Danish company Wavedragon have their R&D project down in Pembrokeshire. However, given the current state of technology, that is not commercially exploitable for some time. Tidal barrage, as has been shown in northern France, River Rance, is commercially exploitable, and based on that experience we have asked for the Severn tidal barrage to be seriously considered. The River Rance scheme in northern France has been generating electricity almost unobserved for forty years, and I understand at a lower price than nuclear; and obviously France has followed the nuclear route quite significantly. We also see very significant opportunities provided by micro-generation, and only recently launched consultation on micro-generation strategy, and we await the response of people on that. We believe that there is within micro-generation significant scope for photovoltaics, not the least of which of course is Sharp, the Japanese manufacturer, which has a European manufacturing facility in Wrexham in North Wales, and we will be doing everything we can to increase demand for that form of energy generation. In terms of renewables, onshore wind developments are the most significant and make the most significant impact in terms of reaching our renewable energy targets. I suppose our view is that it is likely to be an interim technology until such time as other forms of renewables reach a commercially exploitable stage of development. In addition we know for the foreseeable future, in terms of energy production, that fossil fuels will continue to make the most significant contribution, whether it is coal—and we are very dependent on the Aberthaw power station near Barry; and we are delighted that RWE are introducing flue gas desulphurisation technology there to reduce sulphur dioxide emissions. Given the importation of LNG into Pembrokeshire, there is the likelihood of two gas-fired power stations. We feel that for the foreseeable future, while renewables will have a growing part to play, fossil fuels will generate the predominance of our electricity.

Q706 Hywel Williams: That is a long and very impressive list, Minister. However, in the holistic approach to energy would you not agree that demand management is part of the mix; that is to say, you should be looking towards conservation? I did note that you said in your introductory remarks that increased demand was—I do not think you said a given, but you seemed to assume that there would be increased demand. Can you address some remarks towards conservation and demand management?

Andrew Davies: You are quite right: it is clear that the most significant impact we could have on reducing carbon dioxide and other warming gases would be by reducing our energy consumption in the very first place. We are working with the UK Government seeking to do that very significantly, particularly through the management of our own estates, as a government, through the public sector—for example the work we are doing with the Carbon Trust on the NHS estate in Wales; we are improving efficiency, and reducing energy use. Similarly, in terms of the design of public buildings, this building probably being the best example of that, we are reducing energy use in the first place but at the same time we are looking at using renewable energy sources such as heat exchange through drilling into the earth’s core. The challenge we have in the private sector is that until fairly recently energy has been fairly cheap in the UK. The First Minister and I meet with the energy industry regularly, both energy users and producers, and only a couple of years ago the biggest problem faced by energy producers was that energy was cheap and they were taking a lot of energy production out of circulation and mothballing for example the Fifoots power station just down the road near Newport. The incentive to save on energy costs at that time, when energy costs were low was minimal. Clearly, we are faced with a very different situation, and it will be much easier to encourage both industrial and domestic users to reduce energy now that the cost of energy, both gas and electricity, have increased significantly; so we are working very closely with the UK Government on a range of measures to reduce our use of energy, particularly in terms of design of buildings, making them more energy-efficient.

Q707 Chairman: You mentioned buildings. Your ministerial responsibilities also include transport. We were struck, during our recent visit to the United
States, by the Green Cities' Alliance—cities like Chicago, Denver and Seattle. They place great store on public transport and the interface with development of brownfield sites for housing and other public buildings. Have you given much thought to the place of transport in this mix?

**Andrew Davies:** Very much so. Until fairly recently, however, we had very few powers in terms of transport; but since the Railways Act of last year and the Transport Wales Act have now reached the statute book, we have the powers, as a government and as a legislature, to drive an integrated transport policy. We are currently drawing up the All-Wales Transport Strategy, which is one of the first requirements of the Transport Wales Act. Our commitment to public transport is well known. Obviously, the powers we have had until now have been fairly minimal, if almost non-existent, to drive and deliver an integrated system at a local level. We are now working with local authorities, both individually and collectively across the four transport consortia in Wales, to encourage a modal shift. Our commitment to rail transport is well known. Obviously we opened the passenger services on the Vale of Glamorgan line last June, and next year we will be opening passenger services on the Ebbw Vale line for the first time since the Beeching cuts of the early 1960s. Rail use in Wales is growing very significantly, and I understand faster than any other part of the UK. Given that traffic growth is projected to be faster in Wales than the rest of the United Kingdom, there is a major imperative on us to encourage an even greater and more significant modal shift in the use of bus and rail. Wales is one of the few parts of the United Kingdom where the long-term decline in bus use has stopped and been reversed. To a large extent, that was a result of our policy on free bus travel for pensioners and the disabled. We are looking to build on that, working with bus companies to make bus travel even more attractive and accessible. Clearly, we are still very early in that process, and we realise there is still a very significant amount we can do in that policy area. We are working with the UK Government on the very important policy development of congestion charging and road pricing, as a way of reducing traffic growth.

**Q708 Chairman:** I take it from that answer that you would be looking at best practice in other countries, like the US and other European countries.

**Andrew Davies:** Very much so.

**Q709 Hywel Williams:** Can I refer back to my previous question? Are you planning on the assumption that demand will increase and therefore supply will have to be found? Are you planning that they will remain stable or decline? Which way are you looking?

**Andrew Davies:** Our assumption is that all the projections are, and our assumption is, that energy demand will grow. It is not something we welcome, and we will be doing everything we can to reduce energy use. But all the projections are that energy demand will grow. Clearly, given Wales's industrial and economic structure, we have companies like Corus and the metal industry, which are very significant users of energy. The aluminium industry is another one.

**Q710 Mr Jones:** You mentioned sections 36 and 37 of the Electricity Act and described this new power as an anomaly. Can you explain why you see that as such; and what would be the benefits of transferring those powers to the Assembly?

**Andrew Davies:** It was at the time of Cefn Croes and a legislature, to drive an integrated transport policy. We are currently drawing up the All-Wales Transport Strategy, which is one of the first requirements of the Transport Wales Act. Our commitment to public transport is well known. Obviously, the powers we have had until now have been fairly minimal, if almost non-existent, to drive and deliver an integrated system at a local level. We are now working with local authorities, both individually and collectively across the four transport consortia in Wales, to encourage a modal shift. Our commitment to rail transport is well known. Obviously we opened the passenger services on the Vale of Glamorgan line last June, and next year we will be opening passenger services on the Ebbw Vale line for the first time since the Beeching cuts of the early 1960s. Rail use in Wales is growing very significantly, and I understand faster than any other part of the UK. Given that traffic growth is projected to be faster in Wales than the rest of the United Kingdom, there is a major imperative on us to encourage an even greater and more significant modal shift in the use of bus and rail. Wales is one of the few parts of the United Kingdom where the long-term decline in bus use has stopped and been reversed. To a large extent, that was a result of our policy on free bus travel for pensioners and the disabled. We are looking to build on that, working with bus companies to make bus travel even more attractive and accessible. Clearly, we are still very early in that process, and we realise there is still a very significant amount we can do in that policy area. We are working with the UK Government on the very important policy development of congestion charging and road pricing, as a way of reducing traffic growth.

**Q711 Mark Williams:** Do you know when there will be an outcome to those discussions? Originally it was hoped that in 2003 there would be an outcome, but as yet there has been nothing. What is your perception on when?

**Andrew Davies:** The current energy review has to modal shift in the use of bus and rail. Wales is one of the few parts of the United Kingdom where the long-term decline in bus use has stopped and been reversed. To a large extent, that was a result of our policy on free bus travel for pensioners and the disabled. We are looking to build on that, working with bus companies to make bus travel even more attractive and accessible. Clearly, we are still very early in that process, and we realise there is still a very significant amount we can do in that policy area. We are working with the UK Government on the very important policy development of congestion charging and road pricing, as a way of reducing traffic growth.

**Q712 Albert Owen:** Going back to wind farms, you mentioned Cefn Croes and the largest one in the UK here in Wales, and also a number are spotted around the coast. There are three in my constituency that are relatively small but well-established. We found in this inquiry that there is significant opposition to wind farms, not just on land but also at sea. How do you think we can collectively manage this problem of opposition?

**Andrew Davies:** Certainly all the opinion polls that have been done on a UK and all-Wales level have shown that people understand the need for addressing the so-called energy gap, but also the need for renewable energy. The overwhelming majority of people in opinion poll after opinion poll have said they support a wide range of renewable technologies, but particularly onshore wind. I am aware, as we all are, that there is a very vociferous opposition to wind farms, as indeed there are to many developments. I am sure, as elected representatives, we get lobbied regularly on applications for mobile phone masts. Clearly, there will be opposition to any form of energy production, whether tidal barrage, tidal lagoon or any other form. I think a majority of people feel that given the
challenge of global warming, wind farms are a necessary part of the mix, but I do accept that there is a vociferous minority that are against it.

**Q713 Mark Williams:** Amongst that opposition, many allude to the fact that there is a bias in the Route Map towards wind farms, as opposed to other forms. How do you address that?

**Andrew Davies:** I do not think there is a bias in there. I repeat what I said in my introduction: at the moment, in terms of renewable energy, onshore wind is the only really commercially exploitable form of energy production that will help make a significant contribution to energy production in the foreseeable future. I know it is very much a caricature of our position that, as a Minister, I am trying to cover the whole of Wales in wind farms and that I am hell-bent on this. Nothing could be further from the truth. In fact the TAN 8 process was very, very carefully designed to look at a wide range of factors and criteria, particularly those areas of Wales which, in terms of wind power, could make a significant development, but taking into account visual impact, and MOD issues such as tactical low-flying areas; and we felt that TAN 8 presented a measured and strategic approach. In Scotland and other parts of the UK there has been a different approach, which has been less strategic and more based on free-for-all. I think that other parts of the UK may well feel that our approach is the more desirable one, and we felt it was the right way to go.

**Q714 Albert Owen:** It is interesting that you mention the planning process and the TAN 8 guidelines, because that is one of the biggest criticisms that we are hearing; that it favours wind farms, and they get the go-ahead over other projects. There is obviously some need to convince the public or even convince local authorities when action groups are consulted that TAN 8 is there. Do you feel that it can be improved even further?

**Andrew Davies:** The basic point is that you will get applications for wind farm development anyway, as they are finding in Scotland and in England; so these applications would come in anyway irrespective of whether or not we had TAN 8. We felt that the measured approach, through technical advice after consultation, was the best way forward, and then we would hopefully have agreement on which areas of Wales were the best in terms of exploitation, particularly of wind in this case. Clearly, that is a matter of judgment. Others may feel that it was better to have a free-for-all. However, I think the idea that we would not be getting applications for wind farm development in Wales if we did not have TAN 8 is quite erroneous; and the evidence in Scotland and England is that you would be getting them anyway; but at least we have a concerted approach for doing so now, based on objective criteria.

**Q715 Albert Owen:** Do you think local authorities are helping or clouding the issue when it comes to the consultation process?

**Andrew Davies:** Clearly, the design of TAN 8 was done after consultation and we will work very closely with local authorities, and they will be the primary recipients of any planning application; and then it is a matter for them to make a judgment on whether or not they approve any application. Clearly, if they turn an application down, there is a method for hearing those appeals. Clearly, local authorities will continue to play a key role in any planning consent regime.

**Q716 Mark Williams:** We all agree that we are looking for a mix of different means of generation. You described wind power as an interim technology; and, again, notwithstanding the issues on technological viability of wave and tidal power, if we were going to construct some time line of opportunity, how far behind do you think wave and tidal technologies are behind an emphasis to date on wind farms?

**Andrew Davies:** The assessment we have had from experts in the field is that the tidal stream and wave technology is likely to be 10 to 15 years, because it is very difficult to say with any degree of certainty. This form of technology—who would have thought twenty years ago that a whole new industry would have grown up around mobile phones? If anybody had asked how quickly mobile phones would reach a mass market, I do not think anybody at that time would have said it would have been less than twenty years! Our best assessment at this time—and I do not know whether Ron wants to come in on this—is that it would be 10 to 15 years, but clearly if there is a technology which is proven technically and which is also attractive to investors, then possibly it could be before then; but our best judgment is 10 to 15 years.

**Q717 Chairman:** Dr. Loveland, you have been very shy in coming forward!

**Dr. Loveland:** If you look forward to 2020, bearing in mind the uncertainty that the Minister has suggested, which is always there, we should have some very strong marine renewable operations around the coast of Wales—wave/tidal; and hopefully the Severn barrage as well. By 2020 we would expect to see very significant marine. Can I also comment in regard to the discussion on TAN 8? There are many words in TAN 8 on onshore wind, because that, as the Minister has said, is the area where we are getting the applications. But there are also lots of words on the other technologies as well, where TAN 8 is extremely supportive.

**Q718 Hywel Williams:** For the Severn barrage we have seen costs of 10 billion. On what is that based, as far as you know? Is it based on academic research or are there companies that are bidding for this now, and is that the ballpark figure that they are working to?

**Andrew Davies:** The cabinet received a presentation from the Severn Tidal Barrage Group, which is made up of major construction companies—Taylor Woodrow, MacAlpine, Balfour Beatty and Alstom, I believe. Their assessment was based on the construction costs in the late 1980s—I believe
1989—which they have calculated on the basis of subsequent construction industry inflation and other factors; so it is a rough estimate at this stage. They believe that given the scale of energy production, which could be between 5% and 7% of the UK’s total energy needs, and given the revenue stream that they would receive, as I mentioned—for example the River Rance has been generating electricity quietly for forty years on a very predictable basis—they believe that it is a commercial proposition and one that they can make work.

Q719 Hywel Williams: You mentioned in your paper the “significant European Commission-driven environmental legislation constraints” that need to be overcome if the barrage were put in place. Can you give us more detail of those constraints and how they might be overcome, and how difficult it would be?

Andrew Davies: The Severn estuary does have a very high level of European designation. It is a special area of conservation; and we are very mindful of that. That is why, in our submission to the UK Government, we have asked for very comprehensive environmental impact assessments to be made, as well as economic and financial impact assessments. We are not ducking this issue. However, we feel that given the overwhelming consensus that global warming is a phenomenon that is occurring and given the fact that it is likely to lead to rising sea levels, an increased frequency of severe weather incidents, which include tidal surges—and the Severn estuary has the second tidal range in the whole of the world—that would significantly urban development in places like Cardiff, Newport, Bristol and Gloucester and other urban developments around the estuary, that the Severn barrage would also have a role to play like the Thames barrage in helping to control those tidal surges. We feel that since we last pressed, as part of the UK-wide Energy White Paper three years ago, the energy situation in terms of the costs and supply of fossil fuels, as well as the almost universal acceptance that global warming is happening, that the context has changed very significantly. Therefore, any downsides in terms of environmental impact may well be a price worth paying in terms of energy production and environmental protection.

Q720 Hywel Williams: Can I pursue that a little? Perhaps I am wrong, but I thought the Habitat Directive was in respect of specific situations rather than broad global effects like rising sea levels! Given the effect that the barrage might have, would the Directive not prevent its building in that it would be, for example, impossible to create a similar environment elsewhere, as has been done in Cardiff and when the water outside here was created? Would that not specifically prevent a barrage?

Andrew Davies: That is why we are requesting that the environmental impact assessment is undertaken, to test these propositions. The evidence from northern France in the River Rance, is that there is now greater biodiversity upstream of the barrage than existed previously. I am not a technical expert, but I understand that the river estuary has a high level of sediment in suspension, and as a result light cannot penetrate the riverbed. After the barrage has been built, much of that sedimentation is deposited, and it leads to a greater range of flora and fauna. We are accepting that there may well be changes. However, if I can contrast it with Cardiff Bay, it is not proposed that there be a permanently impounded area of water; there will be tidal movements. That is the whole reason for building it obviously. It may well be that there will be greater biodiversity. However, our belief is that the challenge of global warming will inevitably lead to environmental changes in areas such as the Severn estuary; and, as ever in government, you have to balance various considerations. We think that this is certainly well worth considering. But it is only by a full environmental impact that we can test these propositions.

Q721 Hywel Williams: Given the thrust of the Directive, therefore, would there need be a derogation from a particular aspect of it in order to allow this development to succeed?

Dr Loveland: If I could just say a few words about the barrage has been promoted in some ways as an alternative to the development of nuclear power. I have seen figures suggesting that two nuclear power stations would not then be needed. If the barrage did not go ahead—this is highly speculative, but would that change the Welsh Assembly Government’s stance on nuclear energy in general, do you think?
Andrew Davies: I think opposition to nuclear energy is based on a wide range of factors. Clearly, there are major issues to do with the secure management of nuclear waste and there is a lot of public concern about that. In an opinion poll that was done by BBC Wales at the beginning of this year the overwhelming majority of people supported our view about energy production, as reflected in the Energy Route Map. Given our existing generating capacity, that also is likely to come through renewable energies, particularly onshore wind; but also energy production that is planned on the back of the importation of LNG through Milford Haven with the likelihood of one, if not two, gas-fired power stations in South Wales, as well as the possibility of another one at Uskmouth near Newport. Our belief is that there will be a very significant increase and enhancement of energy production in Wales; therefore we think it unlikely that investor would want to invest in a new nuclear power station. Over and above that, one of the clear messages that came through the energy summit that the First Minister and I chaired just before Christmas, was a view of energy producers that if a green light was given to nuclear energy production, it is almost certain that people need some form of government or public sector underwriting, if only for the management of nuclear waste. Therefore, from the point of view of a market or investors, that will represent a more secure investment and would distort what is currently the most heavily regulated market in Europe. So there is a concern amongst energy producers that that would distort the market and therefore would undermine the case for other forms of energy production, whether that be gas, renewables, or any other form of energy.

Q724 Nia Griffith: If they were able to raise those funds elsewhere, would you be willing to reconsider the issues?

Andrew Davies: Our view is the same as the DTI; the proponents should come forward with those proposals. If they have commercial backing, then obviously it can go through the full planning consent route. As part of that, they will have to bring forward a comprehensive environmental impact assessment. Clearly, that is our position. If they can get financial backing, that is a matter for them.

Q725 Mark Williams: Presumably the Swansea experience that you have mentioned applies equally to schemes suggested in North Wales and Pembrokeshire as well.

Andrew Davies: Very much so.

Q726 Albert Owen: Can we go on to the nuclear issue? Your paper is confident that sufficient energy generation be supplied from a non-nuclear option over the next 10 to 15 years. You said earlier that the business sector was not fully confident in nuclear, yet the CBI in Wales is very pro-nuclear, so I wonder if you could deal with that one! How do you anticipate getting the base load supply that is needed for heavy industry? You mentioned LNG as one option. Do you have any other options?

Andrew Davies: Our assumption is that for the foreseeable future clean-coal technology and cleaner gas technology, and obviously the latest generation of gas-fired technology—the combined cycle gas turbine at Baglan Bay built by GE is the most efficient form of gas turbine that is available. Our assumption is, based on current technology, that it will be fossil fuels for the foreseeable future that will provide the base load. That is why, three years ago and now, we said to the UK Government that we were very interested in working with them to develop clean-coal technology. It obviously covers a whole range of technologies, whether it is from FGD at Aberthaw through to underground gasification, or indeed what has been pioneered in the US is the carbon capture of carbon dioxide and the sequestration and safe storage of that. Clearly, given that Wales has hundreds of years of coal reserves, we feel very strongly that clean coal has a role to play in that. Maybe, if as much investment had been made in developing clean coal technology as has occurred in gas, we would be in a much better position in Wales when dealing with the challenges faced by energy production.

Q727 Albert Owen: I would like you to respond on the business interest and private money and a level playing-field, because the CBI is coming out pro-nuclear.

Andrew Davies: My understanding is that the CBI would be representing more the energy users rather than the energy producers, and what I was feeding back from the energy summit was the view of energy financial environmental impact assessment. As I said, they are asking for significant public funds in order to underwrite the investment.
producers and their concern that any undertaking to go ahead with nuclear power would distort the market. I can understand the concerns of business that obviously a supply of affordable energy is of paramount interest, particularly in Wales, where we have a high proportion of GDP generated by manufacturing, and obviously some of it heavy industry. I understand their concerns, but our view is that given the projected increase in energy production, particularly around gas, that should address their concerns about a secure and affordable supply of energy.

Q728 Albert Owen: Your position is very clear, but I still want to push you on this issue. If the UK energy review comes out pro-nuclear, the worry that Welsh businesses will have, and particularly the nuclear industry, is that many of the skills will just go across the border into England, and that will not be of economic benefit to Welsh manufacturing and the skills base. Could you respond to that?

Andrew Davies: As I said earlier on, we are part of the UK, whether a UK policy context or indeed part of the UK grid. We cannot declare UDI. Clearly, if there were any proposal for a nuclear power station anywhere in Wales, that would be a matter for the developers to come forward with that, and clearly if it were over 50 megawatt as a government we would not have a role in the formal planning process. Nevertheless, as I said, the overwhelming majority view in Wales, as expressed through opinion polls, has been that our policy reflects the overwhelming views of the people of Wales. However, in terms of the planning process it would be a matter for any developers to come forward and it would be dealt with under the normal planning process.

Q729 Albert Owen: I would add that the Welsh public are becoming more pragmatic towards nuclear, but that is a difference of opinion that we will have. I am very pleased that the Welsh Assembly Government has supported the plans to extend Wylfa because of the unique circumstances with Anglesey Aluminium and the smelter process there; but some people think that this is a contradictory position. I welcome it: I am pro-nuclear and pro the extension. If it were not for the Sellafield issue, then I think safe nuclear generation could go many years beyond the date specified at Wylfa. How do you respond to some who say there is a contradictory position?

Andrew Davies: I understand they feel that way, but I do not share that. I think there is a difference between extension of an existing nuclear power station and a new build. Our position on Wylfa is also heavily influenced by the fact that Anglesey Aluminium is a major employer on the island. It was a significant contributor towards the island’s wealth as well as its employment, and it is heavily dependent on a supply of affordable electricity from Wylfa. If that were not the case, we might not necessarily argue for an extension of the life of Wylfa. Nevertheless, we have pressed the UK Government; they are very aware of our view, and they have a great deal of sympathy with it, but clearly they are considering that very carefully. There are very significant issues to be addressed.

Q730 Albert Owen: Have you any indication of how they are going to view it?

Andrew Davies: Not at this stage. We have made the case because of its impact on Anglesey Aluminium and the island, but there have obviously been meetings and an exchange of correspondence between not just myself but the First Minister to the DTI on this issue. We still continue to make the case strongly for an extension.

Q731 Albert Owen: You mentioned the unique circumstances, which obviously I agree with, on Anglesey Aluminium. They were built together uniquely as a kit, with one supplying the other. If there is no nuclear option in Wales in the future, that would be put at risk, and it would be very difficult to get the load base from any other source. Why do you comment on that? I know you will not make the decision, but if there were a pro-nuclear decision, then do you think the existing sites are probably the best place for them?

Andrew Davies: Even if there were, for the sake of argument, a proposal to build a new nuclear power station on Anglesey to supply Anglesey Aluminium, given the fact that Wylfa is planned to be decommissioned in 2010, and if there is not to be an extension, there is no way that a new nuclear power station could be built, given the current consent regime, before 2010. Even if there were an extension of four or five years on Wylfa, again it would be highly unlikely that a nuclear power station could be built by the time that Wylfa was decommissioned. There are very practical economic planning issues to be addressed in that area. That is why we are pressing the UK Government for an extension so that other options, which may include nuclear, are considered. Our views obviously still remain about new nuclear build. Clearly, we are very aware of the issues and that is why we have asked for an extension; but there are practical problems in terms of the time taken to generate an alternative source of energy.

Q732 Mr Jones: Minister, we visited Tower Colliery this morning and heard there is about 250 million tonnes of coal that could be exploited. How much of that could we use, do you think?

Andrew Davies: As I said in my earlier response, we have argued very strongly that given the known coal reserves in Wales, clean coal has a very major role to play. We are very dependent currently on Aberthaw in terms of energy production in South Wales, and therefore a supply of domestic and Welsh coal is very important. That may include not just in terms of energy production but also in terms of supply of coking coal for the steel industry, predominantly Corus at Port Talbot. We argued very strongly five years ago, as we do now, that clean coal should be an important part of the mix. I was particularly interested, with your visit to the States, to look at this amongst other forms of energy production.
Q733 Mr Jones: I happen to agree with you, Minister: clean coal obviously has a part to play, certainly within Wales. Aberthaw relies on Tower Colliery, and Tower Colliery is going to close shortly, we have heard; so have you identified any sources of coal for Aberthaw and Port Talbot?

Andrew Davies: My understanding is that the proposed open-cast site at Fros-yr-Fran near Merthyr Tydfil—part if not all of that will go to Aberthaw, but clearly there are legal issues regarding the planning consent around that, as you will be aware. We would very much welcome the Welsh coal industry supplying Aberthaw, and when I visited Aberthaw power station earlier this year RWE, the company, were very keen that it be supplied locally. The local plant management were very keen to use Welsh coal because the alternative is to import coal obviously. That is my understanding in terms of supply locally.

Q734 Nia Griffith: When we had the Tower Colliery people before us they mentioned that if new deep mining is not started soon, we will lose the skills base and will not be able to pass on those skills. Do you see any future for deep mining in Wales; and, if so, what steps do you think we should be taking now to secure that future?

Andrew Davies: We are aware of this issue. In fact, Tower have said this; Tyrone Sullivan has said that there is a danger. That is why in principle we have supported the development of an indigenous Welsh coal industry, not just in terms of supply but in terms of the labour force. There have been proposals—plans at Margam and also other deep mines in the Neath Valley at Aber-pergwm and elsewhere, and that is why in broad policy terms we have supported the development of deep mining, partly because of the issue of retaining a skilled workforce that understands the industry.

Chairman: Minister, thank you for your written and oral evidence, and that of your colleague Dr Ron Loveland and all your staff. You have always been very helpful to us; you have almost become an honorary member of the Welsh Affairs due to your frequency of attendance. We look forward to seeing you again very soon. If you feel that in the light of the questions we have posed, particularly in relation to conservation and efficiency and your remarks about public transport that you would like to send a short memorandum about that, we would be very pleased to receive it.
Wednesday 17 May 2006

Members present

Dr Hywel Francis, in the Chair
Mr Stephen Crabb
Albert Owen
Nia Griffith
Mark Williams
Mr David Jones

Written Evidence from Dragon LNG

CONSTRUCTION OF ENERGY IMPORTATION INFRASTRUCTURE IN WALES

INTRODUCTION TO DRAGON LNG

1. Dragon LNG Limited is a special purpose company set up to develop and operate a Liquefied Natural Gas (LNG) regasification facility in Waterston, Milford Haven, Wales.

2. Dragon LNG will operate the LNG terminal, and will receive, store and regasify LNG, and send out gas against the payment of a tariff by its customers.

3. Dragon LNG will operate as a tolling facility, receiving an availability fee, and has entered into a 20-year Throughput Agreement with two customers who are BG International Limited, a wholly owned affiliate of BG Group plc, and Petgas Trading (UK) Limited, a wholly owned affiliate of Petronas Berhad.

4. The sourcing, ownership and subsequent sale of the LNG and natural gas into the UK market will be the responsibility of the customers of Dragon LNG.

5. The Dragon LNG Terminal will have an initial regasification capacity of 6 billion cubic metres (bcm) per annum, and the construction will comprise the refurbishment of an existing jetty and installation of facilities for the receipt and unloading of LNG carrier ships, LNG storage tanks, LNG regasification facilities and natural gas send-out equipment to deliver natural gas into the National Transmission System (NTS).

6. Dragon LNG is ultimately owned by the following companies as follows:

   - BG Energy Holdings Limited (BG Group) 50%
   - PETRONAS International Corporation Limited (“PICL”) 30%
   - Petroplus International N.V. 20%

INTRODUCTION TO SHAREHOLDERS OF DRAGON LNG

7. BG Group operates in four principal business segments; Exploration and Production (E&P), LNG, Transmission and Distribution and Power Generation. BG’s LNG business combines the development and use of LNG export and import facilities with the business of purchasing, shipping and selling LNG. The Project forms part of BG’s strategic response to UK gas supply/demand imbalance and as an integrated gas major connecting gas to high value markets.

8. PETRONAS is the national oil and gas company of Malaysia with business interests in more than 35 countries, and is wholly owned by the Government of Malaysia. The Project is an integral part of PETRONAS’ strategy of expansion of its gas business outside Asia.

9. Petroplus International NV (Petroplus) is an important player in the midstream sector of the oil market in Europe, encompassing refining, marketing and logistics (mainly tank storage).

ALIGNMENT WITH UK GOVERNMENT POLICY

10. The Project is aligned with the UK government’s policy of diversifying energy supply and enhancing security of supply.

11. A supply and demand gap is forecast to emerge between the UK’s existing indigenous gas supply and importation capacity and future demand growth, leading to the need for additional import facilities. The construction of the Dragon LNG facility will help in meeting this need.
What is Liquefied Natural Gas and the Regasification Process?

12. The liquefied natural gas stored at Milford Haven is merely natural gas stored at \(-160\) degrees centigrade. At the Dragon LNG storage and regasification site, the liquefied natural gas is warmed up (to convert it back into a gas) and pumped into the National Grid (formerly Transco) natural gas pipeline network for onward transportation to industry, homes and power generators throughout Wales and the UK.

13. Natural Gas is changed to LNG by cooling it (known as liquefaction). LNG is a very pure form of natural gas and is not carcinogenic. LNG is odourless, colourless, non-corrosive and non-toxic.

14. The temperature of LNG is approximately \(-160^\circ\text{C}\) at atmospheric pressure which results in a volume reduction of c. 600:1 compared to its gaseous form. This volumetric reduction enables long distance transportation of LNG via carrier ships to be viable.

15. Re-gasification is simpler than liquefaction, being a purely physical rather than chemical process.

16. Natural Gas formed from LNG is the same as the natural gas presently used in the UK. Natural gas is composed primarily of methane (typically, at least 90%).

17. In summary there are three steps in the LNG process:
   (a) the liquefaction (or cooling of the natural gas to change it into a liquid);
   (b) the transportation by ship of the liquefied natural gas;
   (c) the storage, regasification (or warming of the liquefied natural gas to convert it back to a gas) and delivery into the national pipeline network. It is this third stage that Dragon LNG is involved in.

18. Natural gas was first liquefied in the 19th century by Michael Faraday and Karl Von Linde. The first liquefaction terminal was built in 1912 in West Virginia, United States of America; commercial production beginning in 1942 in Ohio. However, the industry as it is known today did not start until 1960 when Britain signed a 15-year contract to take less than 1 million tonnes per annum (mtpa) from Algeria. This import to the UK began in 1965 but stopped in the early 1970s when the North Sea started production of natural gas.

19. The first liquefaction plant in the world was commissioned at Arzew in Algeria to supply this contract with gas production coming from huge gas reserves found in the Sahara. Today there are liquefaction plants across the world in Egypt, Trinidad, Algeria, Malaysia, Qatar, Nigeria and Australia. A number of additional projects in other countries are being planned and constructed.

20. In Britain there is a number of existing LNG sites, all of which have been in operation in excess of 30 years. In these plants natural gas is taken from the National Grid (formerly Transco) network, liquefied into LNG, and stored in large tanks similar to those being built in Milford Haven, to ensure that there is enough gas available to meet the peak demand of UK householders and businesses during the winter. When required, it is warmed up into gas and transferred into the National Grid (formerly Transco) natural gas national transmission system.

21. LNG is already stored in Wales at Dynevor, Aberdare, South Wales. Other sites in the UK include Avonmouth (Bristol), Glenmavis (Airdrie, Scotland), Partington (Manchester).

22. There is a new operational import LNG terminal at Isle of Grain (Rochester, Kent) and a further LNG terminal is being constructed in Milford Haven (South Hook LNG).

23. Regasification terminals exist throughout Europe in France (two), Spain (four), Italy (one, with two under construction), Belgium (one), Greece (one).

24. Since 1945, there has never been an incident at a liquefied natural gas (LNG) import terminal that has affected members of the public or the environment.

25. No ship carrying LNG has ever lost cargo from its containment. There have been over 45,000 ship journeys.

CONSTRUCTION OF THE FACILITIES

26. Dragon LNG received its final planning consents to allow construction to begin during 2004.

27. The tanks being built are two-wall tanks, with the first wall made out of nickel steel that prevents low temperature failures. The outer wall is made out of concrete.

28. The LNG tanks will be roughly 42m high and 82m in diameter. They are well insulated to keep the LNG at \(-161^\circ\) in stable liquid form.

29. So far the construction of the two outer concrete walls of the tanks has been completed and work has started on the refurbishment of the jetty and is well advanced with the civil works for the process area.

30. The facilities are expected to be finished by the end of 2007.

31. The LNG Terminal will have a design life of 30 years but to allow for a future extension of service life the main components that cannot easily be replaced, such as LNG storage tanks or jetty structure, will have a design life of 50 years.
32. The LNG Terminal will be designed under a modular concept allowing expansion to increase future throughput if the market requires this.

33. Transco will extend the NTS to Milford Haven and has identified a number of investments which are required for this extension. Primarily, this involves the construction of a new 128 km high pressure pipeline connecting Milford Haven to the existing network at Dyffren Clydach, reinforcement of a section of the existing NTS pipeline downstream of the connection and conversion of an existing compressor station to allow gas to flow in either direction (the connection pipeline).

34. The LNG Terminal will be subject to the Control of Major Accident Hazards (COMAH) Regulations, and a safety report will be required by the Health & Safety Executive (HSE) before the plant can be operated. The safety report will consider all aspects of management and operation of the plant.

35. The LNG Terminal has been designated as an economic key point with priority 1 status by the UK National Security Services and the DTI. This designation is determined unilaterally by the UK governmental bodies and stems from the fact that the Dragon LNG import terminal is expected to play an important role in the UK gas supply.

**IMPACT ON THE PEMBROKESHIRE ECONOMY**

36. The number of people working on the Dragon LNG site is expected to peak at 400-500 although the numbers will vary weekly. At the time of this written evidence there are 155 people on site of which 81% are from the UK and 62% are local.

37. Dragon LNG and its contractors (Whessoe Oil and Gas and Volker Stevin), have made a commitment to recruit locally where this is feasible; however, it needs to be recognised that there is a skills gap in the area. In order to assist in meeting this skills gap, Dragon LNG is investing in training. One example of this type of investment by Dragon LNG is a link-up with the Prince’s Trust to establish a “Get into Construction” programme for young people in the area.

38. Dragon LNG’s contractors have signed up to the Blue and Pink book agreements. This ensures that everyone working on the site will be paid equivalent wages, irrespective of where they come from. There is no ‘cheap’ labour used on the site.

39. Once operational Dragon LNG is likely to employ 35 people with up to 15 people employed providing services to the site. These numbers have yet to be confirmed but this is our current expectation. Dragon LNG will initiate a local recruitment programme for the operations team during 2006.

40. Contracts worth in excess of £30m have been placed with two local companies—Ledwoods (Pembroke Dock) and Rhyals (Milford Haven). There have been 20 local companies working on the site.

2 December 2005

*Witness: Mr John Burley, General Manager, Dragon LNG, gave evidence.*

Q735 Chairman: Good morning. Can I welcome you to the Welsh Affairs Committee.

*Mr Burley: Thank you.*

Q736 Chairman: For the record, could you introduce yourself, please?

*Mr Burley: I am John Burley, General Manager of Dragon LNG.*

Q737 Chairman: Could you begin by giving us some background about Dragon LNG and the plant at Milford Haven?

*Mr Burley: Yes, of course. Dragon LNG is a company that has been formed and has three shareholders: BG Group, Petronas and Petroplus. It has been formed in order to construct and operate the LNG import re-gasification terminal at Milford Haven. Its role is not to purchase and sell natural gas, it is there merely to construct, operate and own the import facility that is there. We are in the middle of construction of the terminal at the moment. We received planning consent in 2004. We are building two tanks for the storage of LNG—liquefied natural gas—and we are refurbishing a jetty that was there.*

Q738 Mr Jones: Good morning, Mr Burley. Could you tell the Committee how much of the gas presently consumed in the UK comes from indigenous suppliers?

*Mr Burley: At present the vast majority of gas comes from indigenous suppliers. That is changing over time but only a very small percentage is currently imported. I could not give you the specific percentage but I imagine it will be less than 5%. That position is likely to change in the future. We have all read in the press as the North Sea production starts to decline there is a need to then replace that natural gas from other sources, and one of those alternative sources is to be able to import natural gas as liquefied natural gas.*
Q739 Mr Jones: In broad percentage terms, what sort of contribution do you think the Dragon facility will make to the UK’s gas supplies?

Mr Burley: The Dragon facility will provide about 5% or 6% of the national supplies. It is capable of importing that volume of natural gas through Dragon LNG.

Q740 Mr Jones: Presumably that gas will go into the network. Is it possible to say how much of that will be consumed in Wales and how much in the rest of the UK?

Mr Burley: It is not directly possible to give exact figures. The way that the infrastructure works in the UK is that natural gas is put into the pipeline network and that is used throughout the UK, but that includes Wales. In the past Wales has been on the extremity, particularly South Wales, of the gas pipeline network. That has constrained some developments that would otherwise have gone ahead because of the need for natural gas. Now that there is an import terminal in Wales that will relieve that bottleneck, if you like, in the system. Some of the natural gas that we import will be consumed in Wales. I am aware simply from reading press coverage and industry knowledge that there are a number of companies looking at potential power from natural gas. As I mentioned earlier, South Wales has been on the extremity of the system and, therefore, to help relieve that extremity it is necessary to provide additional pipelines. In terms of why LNG in Milford Haven, partly it is related to the port which has got a long history of working with the energy industry and it is a deepwater port ideally suited for the sort of shipping the LNG industry needs. It is partly related to physical geographical location and the benefits of the port there but also in order to help relieve the natural gas infrastructure in the UK and provide natural gas to South Wales as well and provide that extra benefit.

Q741 Mr Jones: What other LNG facilities exist in the UK at the moment?

Mr Burley: Actually, liquefied natural gas has been in the UK for over 30 years. It has been in five locations throughout the UK, including one in that area of Wales. Liquefied natural gas is not a new product in the UK.

Q742 Mr Jones: Where are these other facilities?

Mr Burley: One is in Bristol, Avonmouth, and as you go over the Severn Bridge you can see the tanks. Elsewhere they are in Scotland and northern England. They are spread across the country. A more recent development has been the refurbishment of one of those at the Isle of Grain to import natural gas by ship and two projects in Milford Haven, one of which is Dragon LNG and another project going ahead, South Hook LNG. Liquefied natural gas is not a new phenomenon to the UK.

Q743 Mr Jones: What sort of a lifespan would these facilities be expected to have?

Mr Burley: The lifespan is in excess of 30 years. It is designed to operate for 30 years with current equipment but the expectation is it will probably last longer than that and all of our facilities will last longer than that. Certainly if you look back over the current history of the industry, which in its modern state stretches over 60 years, a number of the facilities that started out at that early stage are still operating today. To give you a sense as to that, over that 60 years it has built up and now operates in about 20 different countries around the world and many countries throughout Europe, France, Italy, Spain, Portugal, all have LNG import facilities.

Q744 Mr Jones: Do Dragon have proposals for any other sites in the UK or Wales specifically at the moment?

Mr Burley: No, Dragon LNG does not. We have been set up purposefully to construct and operate this particular facility.

Q745 Nia Griffith: Perhaps if I could just follow on the geography for the moment. North Sea gas, as we understand it, is in the north and the east and presumably all of the infrastructure is there to bring things in from that side, so what is the advantage in having this one site in Wales, apart from the benefit to South Wales itself? It seems that there is a huge pipeline going across at immense expense, why is that necessary? Why was there not infrastructure on the other side that could have coped?

Mr Burley: The pipeline that is being built is to provide for the import of the LNG that is coming from natural gas. As I mentioned earlier, South Wales has been on the extremity of the system and, therefore, to help relieve that extremity it is necessary to provide additional pipelines. In terms of why LNG in Milford Haven, partly it is related to the port which has got a long history of working with the energy industry and it is a deepwater port ideally suited for the sort of shipping the LNG industry needs. It is partly related to physical geographical location and the benefits of the port there but also in order to help relieve the natural gas infrastructure in the UK and provide natural gas to South Wales as well and provide that extra benefit.

Q746 Nia Griffith: Can you explain exactly what liquefied natural gas is? Is it the same sort of gas as we have had from the North Sea?

Mr Burley: Yes, I am happy to do that. I think there is a lot of confusion. People see the letters “LNG” and do not really understand what it is. It is simply natural gas, the same product that you get from the North Sea, the same as consumers use in their homes, 80 million homes throughout the UK, and it is transported across the country. The difference is it is cooled down to transform back into a liquid and that takes place at source locations around the world and then transported as a liquid. The reason for cooling it is simply to be able to transport more of it to make it more economic and to be able to transport more. It is then stored as a liquid at minus 160 degrees and when we want to put it into the Grid it is literally just warmed up. There is no real process that takes place, simply we pass water around the outside of the pipe work and that warms up the liquid, turns it back into natural gas and then it is pumped out into the pipeline network. It is the same as the natural gas that we are used to today.
Mr Burley: I think that is a matter that is being addressed by National Grid. That is part of the pipeline infrastructure. That pipeline is not transporting liquefied natural gas, it is just transporting natural gas as an enhancement to the existing UK gas pipeline infrastructure. I am not aware that people have concerns. I am not aware of the specific concerns because it is a matter that is being addressed by National Grid.

Q751 Mark Williams: You have touched on the safety issue there and I think in your submission you mentioned the contribution that liquefied natural gas would make to security of supply.

Mr Burley: Yes.

Q752 Mark Williams: Could you outline more immediately security plans and existing security issues relating to the plant and pipelines?

Mr Burley: The terminal has been designated by the Home Office as an economic key point and that, therefore, has a number of security implications. That means that the security arrangements for the site are determined by the Home Office. In fact, all gas facilities in the UK, port facilities and onshore terminals, are designated economic key points, it is not unusual that that is the case. What it means is that the Home Office determines what security arrangements are at the site and those are then applied on the site. It really relates to the type of fencing and the security arrangements at that site.

Q753 Mark Williams: The pipeline itself?

Mr Burley: The pipeline has no specific security arrangements that are necessary; it is simply an enhancement to the existing pipeline infrastructure throughout the UK, of which there are many thousands of kilometres. Once the pipeline is buried the risk to the pipeline is very limited.

Q754 Mark Williams: In your submission in paragraph 24 you mentioned that there has never been an incident at LNG that has affected members of the public or the environment. Have there been other incidents you may wish to relate to us that have not involved members of the public directly?

Mr Burley: You are absolutely right, we are not added benefit in that respect, it is a safe product to import.

Q748 Nia Griffith: Apart from what you have already mentioned, are there any specific advantages and disadvantages of LNG?

Mr Burley: There are several advantages, one of which is you diversify the sources of supply available for importing natural gas. It also allows us to bring natural gas from a wider variety of locations. Traditionally we bring it by pipeline from Norway and other parts of Europe but where the distances are just too great for that to take place we liquefy it and import it as LNG. That is the big benefit. One of the other benefits it provides to the UK is it provides a reliable source of energy to replace the declining production in the North Sea. It would be worth mentioning, because I know it is a concern, that the safety of the industry is paramount and over 60 years it has had an exemplary safety record throughout the world, certainly in re-gasification, so it has an added benefit in that respect, it is a safe product to import.

Q749 Nia Griffith: I think you have explained that re-gasification process very well. Could you enlighten us about the concerns in Cilfrew where there is some sort of valve proposed and there are concerns about the safety?

Mr Burley: Sorry?

Q750 Nia Griffith: There are some concerns in a small village called Cilfrew near Aberdulais, near Neath. You say you have got a very good safety record but could you explain what are the issues there.

Mr Burley: Immediate. There is a 24 hour control room on the site. It is manned by the operators. Whilst the system is inherently safe in the sense that it does not need manual intervention to deal with any problems, there are trained and skilled operators on the site as well.
Q756 Mr Crabb: As a consortium did you look at any alternative locations, either in Wales or the UK, for this project?

Mr Burley: A number of locations were given some consideration but Milford Haven was ideally suited for the reasons I have mentioned: port facilities, access for the shipping, the fact it was a brownfield site and there is an opportunity to regenerate that site and refurbish the facilities there. For us it was an obvious choice.

Q757 Mr Crabb: What kind of assistance or inducements were provided either by central Government or any other tier of government to enhance the attractiveness of Milford Haven?

Mr Burley: There were no additional enhancements or inducements offered by local, central or regional government to Dragon LNG. We are not being provided with a grant of any sort for the construction of the LNG terminal. We went through the normal planning process that any industrial or home development would undertake, no specific support.

Q758 Mr Crabb: Given your experiences with the project, how effective and efficient do you think the institutional arrangements are that we have in this country for granting planning consents and hazardous substance consents to LNG products? Could you comment on the interface you had with the DTI, the Welsh Assembly, local government and any other statutory consultees?

Mr Burley: When we went through the planning consents there were over 38 statutory consultees who were included as part of the planning process. It was an extremely wide consultation that took place over a number of years. In our case the process started in 2002 and we received our planning consents at the end of 2004. It was over an extended period of time with a wide variety of consultees as part of that. It is the normal planning process we have gone through and that has worked successfully. You will be aware that there has been a subsequent request for a judicial review and, of course, that is taking rather an extended period of time to come to fruition. Other than that, the process was very extensive in terms of the number of consultees and parties involved.

Q759 Mr Crabb: Given the extraordinary letter from the Treasury Solicitors to the Court of Appeal three weeks ago which made it clear that contrary to information contained in the court’s written judgment HSE had not, in fact, carried out a risk assessment of a major release of LNG from a ship tied up at the jetty, are you able to tell this Committee whether any such assessment has been made and, if so, by whom?

Mr Burley: We certainly undertake risk assessments. I am conscious that there is an oral hearing at the Court of Appeal as part of the request for judicial review. With that pending it is difficult for me to give as full an answer as I would like today but I am happy to do so as a follow-up once that process has been completed. Yes, risk assessments were undertaken.

Q760 Mr Crabb: For the record, you are satisfied that adequate risk assessment comparable to the rigour and quality of risk assessments for the landside risks have been undertaken for the marine risks and that work has been done?

Mr Burley: Marine risk assessments have been carried out.

Q761 Mr Crabb: Would that be work that you could make available to this Committee as part of the inquiry?

Mr Burley: It is not normal for risk assessments which are carried out as part of COMA submissions to be made publicly available, that is not the norm in the UK. It is not particularly an LNG or energy industry question, it is just a wider issue.

Q762 Mr Crabb: One final question on this. What potential is there for the court hearing to delay the scheduling of the project?

Mr Burley: We hope it will not delay the scheduling of the project. As I say, we are in the middle of construction at the moment. We are confident nothing untoward did take place and we went through the correct processes for receiving planning consent, so we do not envisage any difficulties arising.

Q763 Mr Crabb: You do not see a risk that those planning consents and hazardous substance consents could be overturned?

Mr Burley: As I say, we are comfortable that we went through all the right planning process. Whilst, inevitably, clearly it is a frustration and a diversion we are confident that everything was done correctly.

Q764 Albert Owen: Apologies for being late. Going back to the safety and planning issues, how volatile a cargo is LNG compared to aviation fuel because one of the big issues with aviation fuel is obviously combustion and fire and the berthing of vessels whereas with crude oil it is the impact it has on the marine environment, particularly you can set it alight easily? Where does LNG come in the volatility of cargoes?

Mr Burley: It is a very different type of cargo. It is much safer than other petroleum products. To give you an example: if you had a glass of LNG as a liquid you could stub out a cigarette in that. That gives you an idea that it is a stable product. Once it vaporises and warms up and transforms into vapour it is the same natural gas as is used in homes throughout the UK. It is a product that members of the public in terms of natural gas are used to and familiar with.

Q765 Albert Owen: If there was an incident in the port and there was an accident at a berth it would be likely to damage the marine environment rather than to be an explosion?
Mr Burley: No, it would not damage the marine environment in the same way as if you had oil pollution. What would happen is literally it would pool and over a period of time it would vaporise off. As it warms up it vaporises. Natural gas is lighter than air and, therefore, it would not leave any lasting impact on the water or the immediate habitation around that area.

Q766 Mr Jones: There are risks of pool fires and flash fires as far as an LNG spillage, is that correct?
Mr Burley: There is a risk, as with all LNG, and that is why we undertake risk analysis to make sure that is managed out of the process and risks are contained and managed properly.

Q767 Nia Griffith: Can you tell us a little bit about how many jobs will be created both in the construction process but also in the longer term?
Mr Burley: Yes. During the construction process, in terms of the team on site during construction of our site, we will have at the peak in excess of 400 people. We have made it a real focus to try and attract as many of those from the local area and at times up to 70% have come from the travel-to-work area. We cannot always get the skills that we require and there will be specific circumstances when we have to bring skills in from outside the area during the construction period. We are endeavouring to work with a number of different organisations to help skill up in the area, working with the Prince’s Trust and talking to a number of other organisations to help enhance skills and training in the area. That is the order of magnitude in terms of the current construction. There are knock-on effects during that period. We have got a significant number of subcontractors working on the site from local companies. At the last count there were in excess of 20. Particularly in two cases we are spending in excess of £30 million with two local subcontractors. That in itself generates significant work and employment opportunities elsewhere in the local economy. During the operations phase, which is clearly different, the manpower levels are lower and on our site we would anticipate 35-40 people. We are still reviewing that at the moment and as part of the process we will go out to recruit operators and train those up during the course of this year. In addition to that, we are aware, as I mentioned earlier on, there are other economic development knock-on effects as a consequence of having the terminals built at Milford Haven and we talked about some of the power station proposals that are around, so I hope it will have some long-term economic development benefits for the area.

Q768 Nia Griffith: Are you suggesting that those 35-40 jobs are likely to be local jobs?
Mr Burley: That would be our ambition and certainly over the long-term I think that is right. Perhaps in the first phase we will have a variety of experienced people on site and we will build up to that. That is certainly our aspiration, to make those local jobs.

Q769 Nia Griffith: If I could turn to the contractors who have been working for you. Could you put that in context for us in terms of what percentage they represent of the money you have spent? You have given us the number of contractors but how does that look in that context?
Mr Burley: The actual terminal itself will cost us about £200 million to construct but the vast proportion of that is in materials, specialist steel that has been imported that is simply not possible to get in the local area or to get much of it in the UK. Some of it does come from the UK but not all of it. A large proportion of the spend is on equipment and steel that in some cases has to be imported. In terms of the manpower levels and that expenditure, as I say up to 70% has been from the local travel-to-work area and a lot of fabrication is taking place within the local vicinity. Of that which is non-equipment, if you like, it is an extremely high percentage.

Q770 Mr Crabb: There has been quite a dramatic fall in unemployment in Pembrokeshire in the last year, particularly male unemployment. Are you aware of any studies which have tried to assess what proportion of this fall in unemployment is the direct responsibility of LNG? Is there an LNG effect?
Mr Burley: Certainly we would like to think there is. I am not aware of any specific studies that have investigated that. As you say, the trend in the UK has been in the opposite direction. I think there is a clear expectation and a linkage between the work on the LNG site and by the very nature of being able to employ as many people from the travel-to-work area as we can we have had a direct impact on those figures.

Q771 Mark Williams: More generally, what has been public reaction to the construction of the site? I suspect we touched on some of that just now but what are some of the concerns that members of the public in the area have raised with you? As a company, how have you gone about responding to those concerns?
Mr Burley: They probably separate out into two areas. One is the LNG safety questions that have been raised and a number of people have had concerns about that. The way we are addressing that is by getting out into the community and taking opportunities to help explain what LNG is and what is going on at the Waterston site. We take as many opportunities as we can, one of which is today, to help inform on the project. We also go out to speak to a variety of Milford Haven users, the Rotary Club and a number of other different groups, to help improve knowledge and understanding over a period of time. The other area is probably more of a construction impact to do with the construction period that particularly affects the village of Waterston. We have regular meetings with the village through the liaison committee that has been established there over many years now. In fact, we did make some significant changes to the plans for construction. We reopened the railroad that had been disused in order to bring aggregate in for the construction process and that has taken over 4,000
heavy goods vehicle journeys off the road which would have had a very significant impact on the village. We have also tried to amend the entrances to the site so that limits the impact on the village. Vehicle movement is probably the main impact and we have tried to address that through the opening of the railroad. We have introduced rules where we use heavy goods vehicles only between the hours of eight and four thirty during the day and only Monday to Friday. That is what we aim to achieve but that is not always possible, inevitably there are instances when we have to bring in vehicles outside of those times and in those situations we endeavour to provide information to residents who will be affected by that by fliers through their doors to help advise them of any specific situations. As always, there will be instances when someone arrives 15 or 20 minutes earlier than we wanted them to and they are talked to and we try as actively as possible to limit the amount of movement. We target to have only 20-25 heavy goods vehicles arrive at the site a day but recently that has been down to about 12. As you can see, we are making a lot of efforts to try to limit the impact on Waterston village.

Q772 Chairman: If I could end by asking a final question. You may have answered this already in your earlier response to Mr Mark Williams. How would you characterise your relationship with the local community? What precise processes of consultation have you had and what are the outcomes of those consultations?

Mr Burley: The principal consultation at the outset was that which took place as part of the planning consent. To bring it up to date, we do work with the liaison committee of the village. We are a new company which has been formed so it is a slow process to get out there to improve people’s understanding of what is happen at Waterston for Dragon LNG. It is a programme that we are undertaking and community affairs is a key focus for us to get out there and explain to people what liquefied natural gas is. It is a focus of our business to try to help improve understanding.

Q773 Albert Owen: Just on the link between employment and community issues, you mentioned a number of august bodies, including the Rotary Club, and I am sure there are big interests there, but what about the future? Do you have any links with the schools? Do you plan on any links for career paths with colleges and schools because I think looking to the future is important, particularly if you want to maintain a skill base locally?

Mr Burley: We are working through the Darwin scheme which was set up in Pembrokeshire to help improve science education in schools. Last year we helped to refurbish a mobile science unit that they use to go out to the schools. In fact, since October last year when we triggered that over 80% of all 10 year-olds have benefited from access to that facility and the broadband access that is on that bus. Most schools do not have access to broadband. This unit was able to take science education to those schools and help them to understand. That is an example where we try to help improve understanding. We are working with the Prince’s Trust to help set up a Get into Construction scheme. We are conscious that we can help in some way to improve skills levels and people’s prospects. We are working with the Prince’s Trust which specifically set up a Get into Construction Scheme which started this year and they have started rolling that out for people generally between 16-24, that sort of age group, where we are focusing skills training. Certainly as we go out this year and start recruitment of operators and staff we will recruit those and they will be sent away to receive training on other LNG facilities around the world and will be incorporated into the operations teams of those facilities so they will get real life experience of working in those facilities. Over a period of time we hope to build up a strong skills base to help enhance the employment prospects for people. We are very conscious during construction of construction safety. Everybody who comes on to our site undertakes a two hour safety induction for the site. It is important that we raise people’s expectations when they arrive at the site to the standard that we expect from everybody working on that site in terms of construction safety. Hopefully when people move on from our site they will take those higher standards and expectations with them to other sites. We can only hope that will provide benefits elsewhere.

Q774 Chairman: Do you have a good relationship with your local Members of Parliament, Assembly Members, councillors, the Welsh Assembly Government?

Mr Burley: We certainly have a relationship with them and people have been very supportive in terms of being open and communicative. Clearly they express the concerns of members of the public. We work with Assembly Members, local councillors, MPs and other elected representatives to help improve understanding. There is an open invitation to any Members, and I extend that to the group here today, to come and visit the site, to see what we are doing and get a feel for what is taking place on the site. Yes, we try hard to build that relationship to help improve understanding.

Q775 Chairman: Given what you have described in terms of your concerns about safety and the environment and so on, would you that you have a relationship that could be described as a partnership with the local community? Would you say that the locally elected representatives champion LNG?

Mr Burley: Where we have had the opportunity to sit down and talk to people and explain what liquefied natural gas is, people walk away with a lot more understanding and confidence about what is taking place and at that point they have the opportunity to speak to their friends and colleagues in the community and build the confidence. We are a newcomer to the community, both as an industry and as an organisation, so it is taking time to build those relationships but they are incredibly important
to us because we are going to be there for a very long time. We try to do that through a range of open communications with people and small sponsorship of groups within the village. It is important to us that we help to build that partnership over a period of time.

Chairman: Thank you very much for your evidence today and for the written evidence that you have sent us. If you feel that in light of the questions today you would like to add something further in a memorandum we would be very pleased to receive it. Thank you very much.

Witnesses: Mr Richard Waite, Engineering Director, and Dr Brian Burnett, NDA Regional Director, Nuclear Decommissioning Authority, gave evidence.

Q776 Chairman: Good morning, bore da. Welcome to the Welsh Affairs Committee. For the record, could you introduce yourselves, please?
Mr Waite: I am Richard Waite, the Engineering Director of the Nuclear Decommissioning Authority.
Dr Burnett: Brian Burnett. I am the Regional Director of the Nuclear Decommissioning Authority for region two which includes Wylfa Power Station.

Q777 Chairman: Can you begin by giving some detail of the work of the National Decommissioning Authority and its role in the nuclear power sector?
Mr Waite: Certainly. The NDA was formed on 1 April 2005 under the Energy Act 2004 as an NDPB—a non-departmental public body—with its main and primary purpose to deal with the civil nuclear legacy, and I will go on to explain a bit more about that in a second. Our headquarters is in Cumbria with four regional offices spread around the UK, one of which Brian looks after, as he has just said. Our key driver is safety, environmental protection and security that sits behind everything we do in our mission. We have something like 230 staff at peak split 50/50 between the headquarters in Cumbria and around our regions, and we are moving towards that peak hopefully over the next few weeks. We have an annual budget of around £2 billion which covers decommissioning and clean-up and the costs of our continuing commercial operations. We own the assets and liabilities of 20 sites which were previously in the ownership of BNFL and UKAEA and so on. That includes Sellafield, Dounreay and all of the Magnox stations and, indeed, the research facilities, Harwell, Winfrith and so on. We have 20 sites in total. As I said, our primary role is the safe and efficient clean-up of those sites to programme and cost targets bearing in mind that safety and environmental performance is crucial to all that we do. Those sites are operated under contract from the NDA by operating companies called site licence companies. Those site licence companies are directly contracted to the NDA but they are independently regulated by the various regulatory authorities, so the NII, for example, the Environment Agency and OCNS regulate those site licence companies directly, not through the NDA as such. That is a brief outline of what we do.

Q778 Chairman: Can you describe your relationship to the British Nuclear Group?
Mr Waite: British Nuclear Group are what one would recognise as a parent company for our site licence companies. So the site licence company, for example, that runs the Magnox stations, which is effectively owned by BNFL, as it is in itself, as I am sure you aware, is owned by BNFL. Our relationship with BNFL is one of we are the owner of the sites, BNFL is the owner of the site licence company and we have a parent company arrangement between ourselves and BNFL whereas our primary contract is with the Magnox Electric outfit that runs the sites themselves. That is where our primary contract lies.

Q779 Albert Owen: One of the 20 sites is Wylfa which is operated by BNG, and you have just explained the relationship, but what has been your specific role since April with regards to the decommissioning of Wylfa?
Dr Burnett: For each site we have a small site team of experienced people and their role is to provide contract governance, that is managing the contract between us, and they have an assurance role to make sure that the contractor complies with the contract and the other policy requirements that the NDA have, and as the line of reporting they are the point of contact with the site. It is important to recognise that what we do not do is direct operations on the site and it is very important that we do not get involved in any decision-making processes that might in any way affect safety because that is a matter for the regulators. It is a role of managing the contract, providing assurance and making sure that the contractor meets his contract, so that would be our role.

Q780 Albert Owen: Do you see any potential conflict between the owners of the site and them not getting involved in certain aspects of it?
Dr Burnett: There is a potential for conflict but the contract is set in such a way and the protocols are agreed with the regulators in such a way to ensure that does not happen. It is something that we constantly remind ourselves of because we are not the licence holder. They are a full scope contractor which means that they provide the programme of works, we provide the money and there is an incentive arrangement in the contract whereby they earn a fee against performance against a contract of work that they have put forward and we co-ordinate in a national sense. It is a very important area that we do not direct work that we are not licensed for.
Q781 Albert Owen: At present, what is the timetable for decommissioning Wylfa? You have just brought out this strategic plan, of which we have had the draft and the final. What is the timetable if it can be broken down into layperson’s terms?

Dr Burnett: We will generate until 2010 and there then follows a period whereby we remove the fuel which takes between 18 months and two years, so that takes us to about 2012. Then there is a period of preparation for care and maintenance where all of the facilities outside of the actual reactor core itself are stripped away and that takes us until 2025. The care and maintenance then continues from that date until final site clearance in about 2116. In that period you then come back and remove the core and its contents. That is the established plan reflected in our strategy.

Q782 Albert Owen: There has been some movement since your draft. You are a new body but you did say this would be some 250 years in total. Is 2116 still the end date or can that be brought forward?

Mr Waite: Shall I comment on that? One of the issues that we identified in our strategy was that we wanted to examine the acceleration of final site clearance and, indeed, we do have the commitment in our strategy now to create a business case by the end of this financial year site by site to see whether we can bring forward those end dates. We believe that final site-by-site clearance of that and all areas in the future gives us a number of difficulties in terms of maintenance of skills, socio-economic issues and intergenerational equity issues, and it would be far better if we could see a way to clear them earlier. We have talked about a so-called 25 year site clearance plan but that is a nominal figure. We are investigating during the course of this year what we can do on a station-by-station basis and we will create a business case to present to the DTI if we believe we can do it earlier.

Q783 Albert Owen: I presume you have been learning from sites such as Trawsfynydd?

Mr Waite: We are. We are learning not only from our UK experience but we have recently agreed some collaboration arrangements with EDF who have got some gas cooled operating stations that they have got advanced plans for as well and they are looking to clear their sites within circa 25 years. We are learning internationally as well as from the UK environment.

Q784 Albert Owen: Just one final question on this. During that timetable, and I know you have already engaged with the local community, what further issues do you need to discuss with them? For instance, the socio-economy issues are important and you were talking about retraining programmes already engaged on site but I am interested in outside, so what is your relationship with the local community?

Dr Burnett: We picked up the brief in April of this year. One of the first things we sought to do was to find a socio-economic baseline so we joined together with Anglesey County Council, the Welsh Development Agency and Anglesey Aluminium to do a baseline study for the island. We have done that. We did a public presentation of that. The results of that report will be publicly available. We regard that as a baseline for all of those bodies and any other bodies that are interested for the way forward. We now seek to work with the relevant bodies to look for opportunities to deal with the socio-economic issues from running down station staff. We still have some time to do that and a window of opportunity. We look for capital investment; we look for sustainable things to contribute towards. Over the next two years, I guess things will come forward and we will continue to develop that. The site contractor is a full scope contractor. Part of their contract is to develop these links and to look for opportunities for socio-economic investment.

Q785 Mark Williams: Have you any clear estimation for the costs of decommissioning, particularly in the Welsh context. Trawsfynydd and Wylfa? The latest figure UK-wide this year was 62.7 billion. In a Welsh context, where are we in your estimates?

Dr Burnett: The Wylfa whole lifetime costs are 1.7 billion. I am not sure of the Trawsfynydd figure but I would have thought it was of the order of three-quarters of a billion.

Q786 Nia Griffith: Turning to Sellafield, perhaps you can explain what sort of waste Sellafield receives?

Mr Waite: If I can explain the process in broader intergenerational equity issues, and it would be far better if we could see a way to clear them earlier. We have some collaboration arrangements with EDF who have got some gas cooled operating stations that they have got advanced plans for as well and they are looking to clear their sites within circa 25 years. We are learning internationally as well as from the UK environment.

Q787 Albert Owen: During that timetable, and I know you have already engaged with the local community, what further issues do you need to discuss with them? For instance, the socio-economy issues are important and you were talking about retraining programmes already engaged on site but I am interested in outside, so what is your relationship with the local community?

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high level waste inside the Sellafield complex prior to being taken into a vitrified cask, which is the long term storage and disposal concept that has been in place for some time now for dealing with high level waste. The whole cycle takes the fuel through from being fuel to dissociated plutonium, uranium and high level waste in that sense. That then gets turned into the glass blocks which ultimately will get disposed of or stored, depending on the government’s agreement with the CoWRM recommendations which are coming along in the summer, as we know.

Q787 Nia Griffith: What happens currently with it once you have it in vitrified form?

Mr Waite: It is stored. There is a vitrified product store in Sellafield where the glass blocks are effectively encased in stainless steel and the stainless steel canisters are stacked up on top of each other in a series of cells and stored there until such time as we decide collectively in the UK what we are going to do with them, which could be longer term storage still or ultimate disposal in some kind of repository. Obviously, that is where CoWRM are potentially heading.

Q788 Nia Griffith: What sort of timescale do they need to be stored for?

Mr Waite: There is a cooling period in Sellafield. I cannot remember the exact numbers but it is of the order of a small number of years. From memory, before you can start shipping it out. It is effectively cooled to be able to be handled and put into a repository. I cannot remember the exact number but it is not weeks or days. It is certainly more than that.

Q789 Nia Griffith: There have been some leaks of the CoWRM report which was supposed to be coming out in July. What would you see as potentially the most logical way to store things in the long term?

Mr Waite: During the CoWRM public consultation period last year we offered our views in that we would like to see some form of deep geological repository as a final resting place for this high level waste, primarily because that is where all the best practice seems to be heading. The Finns and so on are heading in that direction. Also, it gives a geological barrier to the fission product release and so on and we believe a safety case can be created to protect the environment for the time required. We made those recommendations to CoWRM. CoWRM, as you probably already know, have released their draft report. It came out a week or so back. It suggested that that is what they are going to recommend but their formal recommendations will not come out until the summer. If they do recommend deep geological disposal, we would welcome that. The key issue for us thereafter is the timing and availability of that repository because clearly the storage regime we have in place at the moment is linked to how long the material has to be stored vis a vis the availability of the repository.

Q790 Nia Griffith: Are there any suggestions as to where that might be?

Mr Waite: It is far too early. It would be premature to speculate. We do not even know what the process will be for site selection because I do not think anybody has designed it yet. I believe the government has to decide upon the CoWRM recommendations in the summer before any of that is considered so I see it as very premature to be even thinking about sites.

Q791 Nia Griffith: You mentioned about 140 tonnes per year coming to you from Wylfa. Is that a correct figure?

Mr Waite: It is the average number. The fuel that has been sent to Sellafield since 1971 from Wylfa is around 5,000 tonnes. If you divide the time between 1971 and now, it comes out at about 140 tonnes a year on average.

Q792 Nia Griffith: That is currently all still stored at Sellafield?

Mr Waite: No. The vast majority of that has been reprocessed, the plutonium separated, the uranium separated and the high level waste vitrified as a result. That is an ongoing process. The vitrification process does not finish in Sellafield until 2015. That is the current target and we will stop vitrification at that time.

Q793 Nia Griffith: Of the 140 tonnes that you get, you say you vitrify some parts of it. What percentage of the volume is that and what happens to the rest?

Mr Waite: It is a very small percentage of high level waste. It is of the order of less than 2% from memory. The vast majority is recovered uranium because this is uranium metal fuel. The main construct of that is uranium 238 and that 238 is recovered during the dissolution process. It is separated out from the dissolved liquor and it is transformed into powder form for storage in drums for potential disposal or potential reuse. That is another strategic issue that we have identified in our strategy document that we are currently working on, the issue of whether separated, recovered uranium is for reuse or for disposal.

Q794 Nia Griffith: What volume do you receive from all of the nuclear power stations?

Mr Waite: I do not have that at my fingertips. Dr Burnett: The plant at Sellafield reprocesses around 800 to 1,000 tonnes a year, if that is helpful.

Q795 Nia Griffith: Can you tell us a little bit about the life span of Sellafield? Is it going to go on for ever? Does it have a life span and is there a proposed last date for receiving waste?

Mr Waite: Yes, there is. The current plan for closure of the Magnox reprocessing facility is linked to the time it will take after closure to decommision that plant, clean it up to meet the overall commitments that have been entered into by the UK, to meet the OSPAR Convention requirements for near to zero radioactive discharges into the north east Atlantic by 2020. When you work back from 2020, you come up with a date whereby you have to effectively stop operations. Otherwise, you do not have enough time...
to diminish the discharges. That current date for B205, the Magnox reprocessing facility, is around 2012/2013, which then drives back into the two years that Brian mentioned in terms of the flow of fuel from Wylfa needing to come at around 2010. You can see from 2010 to 2012 and through to 2020 there is a programme of activities all linked together to ensure that those discharge requirements are met. As I said earlier, the plant is an ageing plant. There are increasing burdens on asset care and maintenance that are quite significant. Any potential extension of that plant, setting aside the regulatory commitments and so on and the international commitments to reduce discharges, would be quite expensive and also burdened with some risk.

**Q796 Nia Griffith:** You say it would be very problematic to extend the timetable if Wylfa was given an extension. Are you saying it would be problematic to be continuing to receive waste from them after 2010?

**Mr Waite:** Yes, very.

**Q797 Nia Griffith:** You cannot see an easy way of extending it?

**Mr Waite:** There is no easy way. It is not just Sellafield. Sellafield is the primary problem but there are other problems with extensions which we can discuss if you wish but Sellafield’s problem is those facilities which are ageing, our need to decommission them and clean them up to meet the various international commitments that we have. That drives our current timescale, coupled with the fact that they are ageing and taking some looking after in terms of the costs and associated activity of keeping them maintained.

**Q798 Nia Griffith:** Looking to the future, if there were a new generation of nuclear power stations, would you say there would also have to be a completely new generation of dealing with the waste? In other words, new facilities completely?

**Mr Waite:** New build, as I am sure you are aware, is not our domain. In terms of the decommissioning or waste side of it, it is not necessarily the case that you have to reprocess fuel. Other countries and we have a concept where you can store the fuel until you have decay and heat drop-off to the point where you can consider direct disposal in a repository. That is the assumption, for example, for some of the plants in the UK, the more modern plants, that the fuel will not be reprocessed so you do not need a Sellafield type facility in terms of reprocessing. What you will need is a store to store the fuel until such time as you decide that you are going to dispose of it. There are options around fuel disposal or fuel handling that do not necessarily mean reprocessing would have to be continued or replaced.

**Q799 Nia Griffith:** If you do not reprocess, does that mean that you have to store for longer?

**Mr Waite:** It depends on how long it takes to put the repository together so the repository availability timescale is crucial in that. Again, there is a timescale whereby the fuel has to be stored to allow it to decay and cool off. It is in the order of years to allow it to be handled or packaged. You would have to build a plant to condition it; you would have to have containers to put it in and so on. You would have to store those containers and then those would need to be disposed of in due course. That is indeed our plan for some of the later arisings from advanced cooled reactors. At the moment that fuel will be stored and directly disposed of in due course.

**Q800 Nia Griffith:** Would you see it being stored at the sites where it has been used or would you see it being brought to somewhere like Sellafield?

**Mr Waite:** The current arrangements for the Advanced Gas Reactor stations, if we move away from Magnox for a second, is that the fuel will be stored at Sellafield. It will be transported to Sellafield rather than stored at the site. It will be stored at Sellafield until such time as we decide whether it is going to be direct disposed or whether there is some other solution such as long term, dry cask storage. There are various solutions around. We have commissioned—again as part of our strategy which is on our website—a national spent fuel review this year. We are looking at all of the options over the course of the coming year with all the key stakeholders, regulators, NGOs, etcetera, to say, “Let us re-examine whether or not long term storage and disposal is the right thing to do or are there more beneficial options for the UK that we could consider?” That is again being done in the public domain.

**Q801 Albert Owen:** Before going into some of the greater detail on the possible extension of Wylfa, can I go back to the response you gave to the lifetime cost of decommissioning to 2116, 1.7 billion? A lot of percentage of that will be for programmes to enhance the area socio-economically.

**Dr Burnett:** It is 2125. We start the final clearance in 2116.

**Q802 Albert Owen:** A lot of those programmes would be similar to some coalfield regeneration programmes?

**Dr Burnett:** There is not a significant budget in there for socio-economic generation.

**Q803 Albert Owen:** Where will that money come from?

**Dr Burnett:** To fulfil our remit? We are still in the process of consultation and working out what our remit means in terms of how much we will spend. We certainly have no underpinned plans to spend so that number does not include any socio-economic expenditure.

**Q804 Albert Owen:** BNG told us that the decision for an extension on Wylfa rests with yourselves. That is what they told us in their submitted evidence. I understand you have touched on some of the considerations and you call them problems. I call them challenges because we have a fixed timetable. In that fixed timetable, you say obviously we have the international obligations of 2020 but within that
have you been flexible in the sense that, yes, you produce 140 tonnes? One of the reasons for a request for an extension is the unique situation of Anglesey Aluminium which takes most of the electricity produced at Wylfa. Have you looked at possibly running it down in a different manner—i.e., keeping one reactor going where half of that could be used at Anglesey Aluminium and the other half sold on the market, thereby producing less fuel, which could be handled under a different timetable to the one you envisage now?  

**Dr Burnett:** There are two issues there. It is currently UK policy to reprocess Magnox fuel. The type of fuel Richard was talking about for advanced gas reactors and pressurised water reactors is an oxide fuel so it is a different fuel type. The issue about closing down the plant at Sellafield is when you receive the last fuel element. If we were to extend Wylfa, we would have to extend the life of 205 and associated plants with all the costs, problems and challenges that that presents. Running it down more slowly does not help you. It is the despatch of the final amount of fuel and the defuelling cycle. We will clearly optimise the closure of the reactors within the safety envelope permitted by the NII, to achieve the maximum return on the asset which is an operating power station and thereby the socio-economic benefit. We will finesse it as best we can but the critical thing is the despatch of the last fuel element.

**Q807 Albert Owen:** We have heard those figures before but what additional revenue in two years would be from Wylfa Power Station? You have a contract of a quarter of that going at a fixed price. Let us say that would have to be negotiated but to the grid at today’s prices. I do not expect you to speculate on an exact price for the future.

**Mr Waite:** Indeed, if it is an net benefit in terms of the overall life cycle costs of dealing with waste arisings and so on. We are required to identify such things and put them up to the DTI for endorsement. We are progressing one right now on Wylfa for potentially extending the current closure date from April 2010 to December. That is progressing through due process, looking at the electricity generation revenue versus the cost of extension, bearing in mind it does not breach some of these boundaries that cause us the larger difficulties around OSPAR and so on. This is an example, if you like, of us voluntarily seeking out an opportunity for making additional money out of this. In parallel with that, we are also being asked by the DTI to carry out a feasibility study on further extensions beyond 2010, where we do take account of the revenue that would be generated, the market price that you have to assume in terms of the different scenarios and so on; but also offset that against the various costs of potential extensions of Wylfa, Springfields and Sellafield. We are currently doing that study. We can talk to you about where we are on it today. Some of the information we are sharing with you today is from that study. We are going to make that publicly available in due course.
when we have finished that bit of work for the DTI. At the moment, it would be fair to say it is looking unlikely that an overall positive business case would be generated when you take account of the costs of Wylfa, Springfields and Sellafield operational extensions and all that they mean against even the optimistic views of electricity pricing. It is not looking positive. We have not finished the work but we can talk about some of the underlying figures.

Q809 Albert Owen: I would like to get at what likely additional production there could be from that two year extension.

Dr Burnett: There are two or three variables here. How much station output can one assume? We have sought advice from BNG about what they would estimate would be the output at that time. That figure is obviously subject to large variation. We have also sought advice from the DTI on what electricity price one should assume at that time. We are all aware they are very high at the moment. They are likely to come down. If you put those two things together, the two year income from Wylfa is around 380 million. If you were to continue with the Anglesey Aluminium contract which you alluded to, that would reduce to around 330 million but that is just the income.

Q810 Albert Owen: You have the income aspects and those ongoing costs that you would have to bear in the business case. Additional to that for the wider local economy, there would be possible closures and job losses that could be added to that equation? I know it is not a matter for you.

Dr Burnett: It is a matter for us in so far as we have to have proper regard for the community. The figures for the run-down are published in our lifetime plan. They are published in the “tribal” report which you are familiar with. Yes, the impact of that is known and the impact on the economy can be calculated.

Q811 Albert Owen: If there was closure, if you could not get an alternative source, there would be somewhere in the region of 20 million per annum of lost revenue. You would be starting the decommissioning process in 2010. If you were to extend that, there would be no job reductions at Wylfa for those years?

Dr Burnett: That is a reasonable assumption, yes.

Q812 Mr Crabb: There have been reports in the Welsh press recently about Wales being considered as a possible site for deep storage of nuclear waste. Is this something you have been involved in?

Mr Waite: The CoWRM report thus far has only set draft findings. The government has to decide in the summer whether or not it is going to accept the formal recommendation of deep geological and our understanding is that only thereafter will a process begin, of which we have no visibility, with regard to some kind of site selection mechanism. It is too premature to talk about specific locations in my view at this point in time.

Q813 Mr Crabb: As far as you understand, these are unsubstantiated rumours?

Mr Waite: As far as we are aware, yes. We are not involved in that in any case.

Q814 Mark Williams: This Committee, as part of its investigations, visited the Argonne Laboratory in America and we heard about pioneering work to reduce the life span of hazardous waste down to between 100 or 200 years. Is such research being undertaken here? If not, what are your links with America and can some of the technologies they are using be employed here?

Mr Waite: One of our remits under the Act is to ensure that we commission sufficient research and development to support our overall mission. That is not only spending money ourselves; it is also looking to establish collaboration agreements with other organisations that may well be spending money on certain techniques such as the one you mention, whereby we can tap into that for the benefit of the UK taxpayer. We have recently signed up to an agreement, for example, with EDF in France, where we are going to share information about how to handle their gas reactor decommissioning. We might be able to benefit from that. We are close to signing one with the Department of the Environment in the US who clearly are the people involved in the Argonne work as well. With regard to that particular activity out there, we are familiar with it. We have arrangements through one of our organisations where we are keeping tabs on progress, as indeed we do on many R&D streams. It is fair to say that the technique that you are talking about, as far as we can see at the moment, is very much one at bench test level. It is pretty much experimental. It is the transmutation process that has been developed under the guise of the urex, uranium extraction, process, where they take uranium out but leave the plutonium and heavier isotopes in there. They simply bombard them with neutrons and transmute them into more stable elements, thereby reducing the overall hazard over time. It is a very interesting technology. We are keeping tabs on it. In terms of it becoming industrialised, with the timescale that we would require to make an impact on our programme, we think it is pretty unlikely that we will be able to treat any of our high level waste through that process. Our timescales are to finish reprocessing and vitrify our stocks by something like 2015. Having said that, if somebody does produce a pilot plant and we can tap into that, we would be more than interested.

Q815 Mr Crabb: What sort of budget are you talking about on research and development?

Mr Waite: We fund a direct portfolio with an organisation called Nexia, which is our only direct spend on R&D. That is circa nine to 10 million a year. The larger spend is for our site licence companies. Our site licence companies commission work as well and that is running at around 70 to 80 millions at the moment. There are significant areas in technology development where we will continue to spend on R&D to minimise waste forms, to
look at better ways of treating waste, to look at accelerating decommissioning timescales, improving safety margins and so on. As I said earlier, one of our key remits under the Act is to make sure that we are at the front end of all that R&D.

Q816 Nia Griffith: Did you say “Nexia”?
Mr Waite: Yes. Nexia Solutions are owned by BNFL. They are resident at the Sellafield site. They have, from memory, some 800 employees involved in various forms of operational R&D and examination of nuclear materials and so on for a number of customers, not just the NDA, so the MoD, British Energy and so on make use of their skills. We use them to keep tabs on international developments such as the one mentioned by your colleague.

Chairman: Thank you both for your evidence today. If you feel, in the light of the discussions and the questions, that you want to add anything further, we would be very happy to receive a memorandum.
Tuesday 13 June 2006

Members present:

Dr Hywel Francis, in the Chair

Nia Griffith
Mrs Siân C. James
Mr David Jones
Mr Martyn Jones

Albert Owen
Hywel Williams
Mark Williams

Witnesses: Malcolm Wicks, Member of the House, Minister of State for Energy, Mr David Wagstaff, Director, Strategy Development and Delivery, Energy Strategy Unit, Ms Clare Harding, Assistant Director, Coal Policy and Benefits, Energy Industries and Technology Unit, Department of Trade and Industry, and Mr John Williams, Deputy to the Director and Strategic Policy Adviser, Wales Office, gave evidence.

Q817 Chairman: Good afternoon. Welcome to the Welsh Affairs Committee. Please introduce yourselves for the record.

Malcolm Wicks: I am Malcolm Wicks, Minister of State for Energy in the DTI, accompanied by my colleagues Clare Harding, also John Williams from the Wales Office, and my colleague David Wagstaff, who is from DTI.

Q818 Chairman: Can we all raise our voices; this is probably the worst room in the whole of the Palace of Westminster for acoustics, so do not be afraid to shout rather than whisper.

Malcolm Wicks: I have never heard Welsh people having to be asked to raise their voices, Chairman, but I assume that applies to those of us not in that category.

Q819 Chairman: You can be an honorary Welshman for today!

Malcolm Wicks: Thank you.

Q820 Chairman: Minister, can you give us any information on when the Energy Review will be published, and to what extent it will reflect regional energy policy as well as national energy policy?

Malcolm Wicks: The current plan is for a statement before the summer recess, with an accompanying publication. As you know, the DTI has UK responsibilities for energy strategy, and that will be reflected in the review. We are, of course, aware of differences between England, Wales and Scotland, but it will be a UK review.

Q821 Chairman: Could you explain that? Will that review also take account of the views of the Scottish Parliament and the Welsh Assembly Government?

Malcolm Wicks: Yes. We have been in touch with the devolved authorities—I myself at ministerial level and my colleagues have too, of course. What I was rather implying was that in terms of the overall strategy that we are developing, the policy framework in which commercial players can operate, we have taken a UK perspective. We are obviously aware within that that different parts of Great Britain have different energy resources, not least renewable energy. Obviously, we are deeply aware of that.

Q822 Hywel Williams: Good afternoon, Minister. A case in point is that your Secretary of State has said that the Energy Review will be planning for reductions in energy consumption. We were in Cardiff a couple of weeks ago and the Minister there told us that the Welsh Assembly Government was planning for an increase in energy consumption. Is that the case, and, if so, how can these conflicting views be reconciled?

Malcolm Wicks: What we are certainly aware of is our need to reduce dangerous emissions of carbon dioxide. We have got to reduce them very rapidly over the coming decades. Indeed, the most challenging target of all is right up to the middle of this century, where we wish to see CO2 levels reduced on 1990 levels by 60%; and we have targets in the intervening period. It in large part follows from that, in my judgment, that we do need to reduce energy demand. Obviously, however, if we can replace some of our energy, as people are doing, by renewable sources, then that is not an issue because they are not CO2 emissions, but it is sensible in some sectors to think in terms of a reduction in energy demand. How do we do that? We do it by taking seriously energy efficiency and applying that determination to the different sectors, including to the housing sector. The theory on this is not that difficult to grasp of course but putting it into practice is always a bit of a challenge.

Q823 Hywel Williams: Coming back to my point, given the overall UK reducing of emissions, it would be possible therefore for them to increase in Wales even though the trajectory elsewhere was on the way down.

Malcolm Wicks: In order that I can understand, Chairman, may I ask what kind of consumption you are talking about?

Q824 Hywel Williams: I asked the Minister in Cardiff: “Are you expecting as a result of economic development, overall energy consumption in Wales to increase in future or decrease?” He said it would increase. I understand that your Secretary of State has said that on a UK basis the expectation was that it would decrease.
Malcolm Wicks: Certainly in terms of fossil fuels, we need to get a grip on the emissions issue there. Clearly, if in some sectors energy demand is increasing, but maybe through carbon capture and storage in future you are stripping out the CO₂, then the issue is not so much whether demand is going up or down; it is about emissions going up or down. There are two challenges in the United Kingdom. One, on a global level, and, clearly, the most important, is in simple terms about safeguarding our planet from CO₂ emissions; and the other one is about energy supply and energy security. In large part both of those point towards more sources of energy that are cleaner and greener. Obviously, in any developing economy at different times certain components will be seeing an increase in demand. For others we need to make sure we see a reduction in demand.

Q825 Hywel Williams: So in policy terms there is no difficulty at all in having different targets in Wales as we have in England and Wales or the UK in general? Malcom Wicks: I am sure, for example, that in the housing sector the target has to be greater energy efficiency. I think probably we need to firm that up and talk about that meaning energy reduction, if we are serious about carbon emissions, as we must be.

Q826 Hywel Williams: Moving to another point, the Government has a target to reduce carbon emissions and has targets to increase the amount of energy generated from renewable sources. If it is not possible to reconcile those two, which one takes priority? Malcolm Wicks: I think we see the development of renewables as a means to an end in terms of reducing carbon emissions. Unless I have misunderstood the question, do they not reconcile?

Q827 Hywel Williams: Is nuclear power, for example, counted as a renewable? Malcolm Wicks: I do not consider nuclear to be a renewable. I do consider it, when it is generating 20% from renewables some time in future, the electricity, to be a clean source of energy, but it is not strictly speaking a renewable because of the uranium that is required, which is not a renewable.

Q828 Hywel Williams: Reducing carbon emissions by taking the nuclear option would not necessarily meet the other targets of increasing the amount of energy generated from renewables. Malcolm Wicks: That is right, because I do not consider nuclear a renewable, and our target for renewables is about the renewables which we would understand—wind, solar, tidal, et cetera.

Q829 Hywel Williams: If you had to put your eggs in a particular basket, which one would it be; renewables or to reduce carbon emissions? Malcolm Wicks: If I put all my eggs in one basket I think they would be smashed sooner or later! The name of the game here is not to put all our energy eggs in one basket; the name of the game here is to maintain a diversity of supply in the United Kingdom, and that implies for example being cautious about any new dash for gas in the next few decades. We will need gas, and we will need to import a great deal of it of course, but that is one basket I do not want to put all our eggs into.

Q830 Hywel Williams: So you would not foresee any conflict at all in reaching both targets? Malcolm Wicks: No, not at all. I think, Chair, that one of the things that occasionally bedevils this debate is proponents of nuclear, or proponents of wind farms or whatever, saying, “our source of energy is the only sensible one and somehow it can be almost 100% of our requirements”—or that is the implication—and the other is a really nasty thing, and we are going to attack it”. You have nuclear nutcases attacking windmills and you have advocates of renewables attacking nuclear as if this is some world cup match where we have to take sides. It really is a bit more serious than that.

Q831 Hywel Williams: I am concerned about the possible conflict between policy. Malcolm Wicks: No, I do not see any conflict at all. The fact of the matter is that we are in a very challenging time here in Great Britain. I suppose the island has always been, until recently, self-sufficient in terms of energy. Once, we would have gathered in the wood and the twigs—and then there was the arrival of King coal. Coal was still very important, but since the mid-sixties—the early administration of Harold Wilson and the first Beatles single—we have had resources from the North Sea and the wider UK Continental Shelf in terms of gas. We have just now become a net importer of gas; 10% of our gas is now imported. By 2020, not 10% but 80% or 90% could be imported. In a “do nothing” scenario, that is what will happen. We need to ask ourselves some serious questions—not for gas because we do not have to import it—but how we can become rather more self-sufficient—not totally of course as the projections now suggest. To do that, we need to build up 100% of supply. If we can get 20% from renewables some time in future, the question mark over whether we should replace nuclear to maintain about a fifth or so, go more or go less—those issues—we have got to build to 100%. That is why I get a little frustrated—not you, but when some people suggest it is all about one source or another—lots of eggs in lots of baskets.

Q832 Hywel Williams: Will the Energy Review address the possibility of introduction of options to buy only green electricity? Will that be something that you will be considering so that some people might opt to say, “whatever electricity I am buying, I would like it to be labelled ‘green’”? Malcolm Wicks: At the moment the customer can buy from a green company. You can buy green energy. It must be very difficult for those people as they walk around the country and go into different buildings and so on—to be very curious about this. I do not know whether this worries you or not, but 19% of our electricity up there is coming from nuclear. I think you are all sitting in a reasonable place and I would not worry about that, but that is
the reality at the moment. Some people talk about the nuclear debate as if we do not have it at the moment; we have had it for a very long time of course. It would not be for the Government, by the way, to say they were going to interfere with the commercial market so that people can buy green and some people can buy nuclear. This would be for the commercial sector.

Q833 Hywel Williams: I am asking you about an option to buy only green electricity. These people, for whatever reason, might not want to buy electricity which they would—

Malcolm Wicks: As I say, you can do that at the moment. There are some companies that will allow you to do that. I assume it means all the rest of us get rather more nuclear as a result, so there is an ethical issue there that the opponents of nuclear might wish to discuss.

Q834 Mr Martyn Jones: Minister, all this talk of eggs in baskets tends to confirm that we have a very complex energy problem facing the UK.

Malcolm Wicks: Yes.

Q835 Mr Martyn Jones: It would demand, I suggest, a long-term strategic approach.

Malcolm Wicks: Yes.

Q836 Mr Martyn Jones: Probably developing new technologies and providing a stable market for newer technologies. Those new technologies may not come for many years: is the Government brave enough to make those difficult decisions now? Obviously there is a financial implication as well with new technologies.

Malcolm Wicks: It would be feeble of me to reply “no”, would it not—that we are not brave enough, even on this humid afternoon? There is nevertheless a quantity of courage within me to answer that question in the appropriate manner. It is a serious question. I am not renewables-neutral; I am pro-renewables. To remind us where we are at the moment, we are in a situation where maybe only 4% of our electricity this day comes from renewables. That seems a pretty paltry performance, but actually there is—no pun intended—a rising tide. We are moving in the right direction. Every year that goes by sees an increase. We have a 10% target; in other words, we would like to see 10% of our electricity coming from renewables by 2010. It is not easy to hit that target, but we are certainly moving in the right direction. At the moment we have an aspiration that it could be as much as 20% by 2020. That is where we are. As you know, with the Renewables Obligation we have quite an interesting mechanism in place to make the generating companies source so much of their electricity from renewables. That is why large companies are backing wind farms and so on. In terms of technology, where we are is that onshore wind is very close to proving itself commercially. We are seeing more of it, and we will see it on quite a significant scale. Offshore wind is the next one in the pecking order, with some difficulties commercially at the moment—prices of raw materials have increased and so on. After that—and obviously at the risk of some generalisation here—you have to nuance this answer more carefully—you have a number of technologies, many of which are still pretty expensive. It is a familiar issue, as you know. If a new technology survives the R&D stage, it then needs to prove its commercial worth. Therefore, for example, photovoltaics, which is a very important renewable technology, is still pretty expensive, although in some countries it is coming down in price. It is a very important technology and we have been backing that. It is the usual commercial issue. If the scale is there commercially, then the price will come down. The first television set was a very expensive item; they are not so expensive these days. I would not say photovoltaics is at an infant stage; it is struggling to young adulthood or something! Marine technology is a very interesting one. It seems an obvious one for these islands. Marine, tidal and wave power should surely be able to play a part? It is pretty early days. We have some very good entrepreneurs in this country developing those. They have not been tested for very long in the water, as a matter of fact. We are backing them with a new 50 million marine fund. Then there is a whole array of weird and wonderful examples of ideas about renewables, which do need support. I do not think it is for the Government to back particular technologies as such; but it is for Government to have devices like the Renewables Obligation and to have the R&D funds to bring some of these new technologies to life. A question for the review, which we seek to answer—but advice from this Committee would be helpful—is whether the Renewables Obligation is too blunt an instrument at the moment. Is it simply one that has brought on the wind farm? Is it disaggregated enough or sophisticated enough to bring on others? That is an issue that we are addressing. I am not sure what the answer will be yet.

Q837 Mr Martyn Jones: We may touch on that later, Minister. I would like to move on to regional policy. The Head of Policy at the Institution of Electrical Engineers told us that the UK Government should support Welsh national initiatives to promote research, development and demonstration activity in Wales. Can you tell us what projects you are funding and the extent of that funding?

Malcolm Wicks: I think that through general programmes of support for renewables there will be a number of projects. John Williams or others of my colleagues may be able to name specific ones.

Mr Wagstaff: To be honest, we give the money to specific projects, but we do not categorise that by geographical location; it is more likely to be characterised by the sector or the kind of technology. It is possible, for example, that a particular technology is being developed simultaneously in various parts of the UK. We can certainly find out how much of that is going on in Wales; but it will be a geographical answer rather than a regional policy answer.
Q838 Mr Martyn Jones: We know that you are helping with work in photovoltaics at Bangor University and also Technium OpTIC in St Asaph. Malcolm Wicks: Sharp Electronics is a major company in Wales which now has plans to expand, I think not least because of the extra 50 million that the Chancellor gave for micro-generation projects.

Q839 Mr Martyn Jones: One area in Wales where we are not seeing any help given is the Centre for Alternative Technology at Machynlleth. I am sure you have heard of it, but they do vital work in science-based education in renewables, and they tell us they do not have a lot of success in getting support from the DTI. I do not know if you know about that or have any plans to support them.

Malcolm Wicks: I know about the Centre but perhaps I should write to the Committee about that. Given all the excitement and interest in renewables, you would hope there would be commercial opportunities for companies to back centres of excellence.

Q840 Chairman: Would you welcome the Centre for Alternative Technology and the new Welsh Energy Research Centre writing to you about their work? I am rather surprised! I understand why you gave the answer you gave in terms of the sector, but there are some interesting innovative examples in Wales which perhaps ought to be highlighted; and perhaps we should move beyond this fairly crude way of identifying innovation by sector rather than by region and nation.

Malcolm Wicks: I would certainly welcome contact with them. From a DTI point of view, anything we would support would be because of the competence—and I am sure there is great competence of the sector—wherever it was in the United Kingdom.

Q841 Chairman: So that we do not lose the thread of this, obviously we are talking about the UK, but, as a Select Committee, we have been very conscious of some innovation elsewhere, particularly in the United States, right across all sectors. We were particularly struck by the green policies of the Green Cities’ Alliance, with Denver, Seattle and these cities. Does the DTI pick up on these innovative practices internationally?

Malcolm Wicks: Yes, we do, partly because we are conscious that the challenges that face us in terms of climate change are, by definition, global; and partly because we are always on the lookout for learning more about R&D and good ideas. They are sometimes quite close to home. The Mayor’s Office here in London, the GLA, for example, have been quite ambitious in relation to carbon issues and clean-energy issues.

Q842 Mr David Jones: Minister, you touched earlier on the Renewables Obligation, and you conceded that it had been described as a blunt instrument. You also acknowledged that this has led to maybe a disproportionate development in wind power at the expense of other renewable technologies. What does your Department propose to remedy this and fine-tune the Renewables Obligations, so that all our renewable eggs are not going into the basket of wind power?

Malcolm Wicks: Can I say that I think we need more wind power in Britain, and not less. It is still pretty early days. If we are going to hit our renewables targets, we are going to need more. Where they should be is always controversial, and there are matters of planning and so on. Blunt instruments have their uses, do they not? I think it has been very useful in bringing forward onshore wind; but I am now asking myself whether we should be slightly more sophisticated in terms of the RO, in terms of giving opportunities for other sources of renewables. Where that would lead us I am not sure at the moment, but it will be part of our report in July.

Q843 Mr David Jones: Do you anticipate that the Energy Review report will come up with proposals that fine-tune the Renewable Obligation?

Malcolm Wicks: What I know is that it is an issue we have taken evidence on and people have written to us about; and we are looking at it very carefully. As usual, there are arguments both ways, because, clearly, if you were in the onshore wind business you would not want too much disruption there. It is something we are looking at, but I cannot pre-judge at the moment what we will say about it in the review.

Q844 Mr David Jones: You have touched on regional policy. How would you respond to the suggestion that there should be regional competition as between England, Wales and Scotland, to provide an incentive to meet carbon reduction targets? Do you think there is any scope for that?

Malcolm Wicks: Competition?

Q845 Mr David Jones: Yes. Malcolm Wicks: Certainly within a framework of a UK energy strategy, where many things are not devolved, this is one area where there is a UK obligation, and I think that is right and proper. Obviously, there are significant things that are devolved in Scotland for example, but it is important that we maintain a UK energy strategy for fairly obvious reasons. Within that we need a rich variety of players to help us develop the clean energy sources that we need, so in that sense interest from the Welsh Assembly, the Scottish Parliament, local authorities and NGOs is something I welcome.

Q846 Mr David Jones: How do you accommodate that? If, for example, the Welsh Assembly wanted to strike its own distinctive path how would you accommodate that within the fabric of the DTI—Malcolm Wicks: As long as that did not, as it were, interfere with the development of the UK energy strategy and did not involve taking powers from the UK Government that properly belong here; then I think we can be very relaxed about it. I mentioned what we are doing here in this capital city of London in terms of the role of the GLA and the Mayor’s Office, and their determination to try to make
Greater London a greener place in terms of energy. That is something that we encourage and can readily accommodate, because it will help us with our targets and our climate-change objectives.

**Q847 Mr David Jones:** You refer to the powers that “properly belong here”: clearly, therefore, you have some sticking points. What powers would you contemplate devolving to the Welsh Assembly Government, for example?

**Malcolm Wicks:** For example, at the moment the Welsh local authorities have planning jurisdiction for the power plants under 50 megawatts. You can argue about it, but that seems to be a reasonable cut-off point. It seems to me to be sensible that for larger power plants, that should properly belong to the UK Government.

**Q848 Mr David Jones:** But the Assembly is pressing for more devolution of powers above 50 megawatts.

**Malcolm Wicks:** Yes.

**Q849 Mr David Jones:** Do you resist that?

**Malcolm Wicks:** I would be reluctant to concede it. Our officials are in discussion about this.

**Mr Wagstaff:** Would it be possible to make a point about the climate-change programme review, because when you are talking about the different policies in different regions and different nations of the UK there is quite a large section in the document that was published by Defra in March which does have a breakdown of devolved administrations and there is quite a lot of good information there about what is being done in Wales. It is not competition in the sense that you meant, but it is nonetheless a distinctive approach from the various devolved administrations, so there is quite a lot of information that might be helpful in there.

**Q850 Mark Williams:** The Tripartite Group of your Department, the Wales Office and the National Assembly was expected to report on energy consents two years ago. We have still not heard of the report. Why has there been that delay?

**Malcolm Wicks:** I do not think I was aware it was meant to be two years ago. I have certainly had one or two discussions about it, but certainly whatever—the two years thing—it is clearly ongoing. I do not know whether my colleague from the Wales Office knows more about that.

**Mr Williams:** It is important to remember that since the Tripartite Working Group was established, the underlying landscape of energy has seen some significant changes. The UK, for the first time, has become a net importer; there has been more volatility in prices. Now, particularly, the UK Government is undertaking the Energy Review. I think that Andrew Davies, when he gave evidence to you, said that, quite sensibly, it is best to await the outcome of that review before progressing with the work of the Tripartite Working Group so that it can be fully informed of the outcome of the review.

**Q851 Mark Williams:** So you put the delay down to that rather than to any fundamental disagreement between the National Assembly, the Wales Office or your Department?

**Mr Williams:** I do not think there is any fundamental disagreement. The Assembly has made a bid for a transfer of functions, which it can do on anything it wants, and the UK Government is considering it in a collaborative process with the Welsh Assembly. I have been involved in a small part of the Tripartite Working Group, and I can attest that the underlying issues are indeed extremely complex and have taken a great deal of working through. That is still in train.

**Q852 Mark Williams:** If there is a correlation between that and the Energy Review, would you anticipate that the report’s findings would be subsumed into the Energy Review, or can we expect the report—or when can we expect the report if it is not to be subsumed in the Energy Review?

**Mr Williams:** I do not think that they will be included as part of the Energy Review; it will come out after the Energy Review is done so that it is fully informed by the review’s findings. I cannot give you a firm date, I am afraid.

**Q853 Mark Williams:** Can you give me any date, given that this issue first came to light at the end of 2004, and here we are in the early summer of 2006?

**Mr Williams:** I have personally been involved with the group for about a year now, but—

**Q854 Mark Williams:** How often does this group meet?

**Mr Williams:** I think it has met some six or seven times.

**Malcolm Wicks:** We can send a note on that. Clearly, there is an issue here. As Energy Minister, I feel strongly that our country as a whole needs a clear energy strategy. We need to develop a framework in which the market can operate. The market is telling us it needs a long-term strategy. Within that there are some quite difficult and one or two controversial issues to settle. This is not an “any other time” energy policy; this is a time when Britain is on a cusp of just becoming a net importer, when the world out there is not getting any easier in terms of sourcing material. There is a huge global demand for energy. Not at the moment, but a year or so ago, China’s energy demand was increasing by 15% per annum. On top of that energy supply and energy security issue we have major objectives in terms of planning and climate change. I just think we need some clarity about the overall UK position on this. Although I am very concerned, as I said in answer to the other question, that we have a number of players in terms of getting to where we want to move, in terms of overall objectives we need some clarity from this place.
Mark Williams: I think the eagerness you display is also shared by the National Assembly, which is why the request was initiated in 2004, which I believe was widespread.

Q855 Albert Owen: Good afternoon, Minister. I do not want to upset you, but I do want to ask some questions on nuclear energy, particularly the Welsh dimension. You are fully aware of the status of Wylfa nuclear power station on Anglesey, which is due to close in 2010. You are further aware that the Welsh Assembly Government and stakeholders have requested an extension. Can you tell us when a decision will be made on that?

Malcolm Wicks: As you know, Mr Owen, I am pretty up to date on that issue, and I have met with you and the two companies involved. It is a very difficult situation because the aluminium company very much depends for its energy source on Wylfa; and yet Wylfa, like other power nuclear power stations of its type, needs to be decommissioned, because it is old, relatively soon, within the next few years. Although further work is being undertaken, the Nuclear Decommissioning Authority, the national body charged with this complex task— which might take fifty years or so in terms of the element of nuclear waste—will be a little loath to extend the project; and the costs involved are now really very considerable. The situation we have—and Mr Williams might correct me if I have the details wrong—is that officials from the Wales Office and my own officials are working with the companies to see a way forward. At the end of the day, what the aluminium plant needs is a source of energy, a source of electricity. It does not have to be nuclear, but obviously the economics of this are very important.

Q856 Albert Owen: The NDA has told us they are going to produce a report. Some of the conclusions of that may go into the public domain. Will you make a decision after that or alongside it in regard to the extension?

Malcolm Wicks: There is a sense in which I am not sure it is my decision as such, because you are talking about the NDA and private companies; but I hope we can bring this matter to a conclusion as soon as possible. I am reluctant to let this interfere with the huge strategic challenge of nuclear decommissioning, and I would also be loath to involve the NDA or anyone else in huge costs, which perhaps could not be justified.

Q857 Albert Owen: I understand that. I have heard your response in relation to the decision, but is that likely to be linked with the Energy Review or are you going to decouple it?

Malcolm Wicks: I think decoupled. I do not see it as an Energy Review issue.

Q858 Albert Owen: You mentioned also Anglesey Aluminium, which consumes 12% of Wales’s electricity. You talked about negotiations that are ongoing with your Department, the Welsh Assembly Government and the Wales Office. What are the alternative electricity supplies you are looking at collectively with the companies?

Malcolm Wicks: There is a general connection of course with the National Grid. I do not know the capacity of that, whether that would mean some technological improvements, but that is one possibility. Whether there is a suggestion of a new power station being built—I do not mean nuclear—to tackle this problem—do not forget, Mr Owen, that we are not in a situation now where I sit here as the Minister for Power, and all of this stuff is nationalised, and it is kind of in my gift, as it were, to make a wise judgment. We are talking essentially about commercial contracts here, but if the Government in Wales can facilitate that, the discussions to look meaningfully at the options—that is our goal and that is what we are doing.

Q859 Albert Owen: But you do accept that it is quite a unique circumstance in the Welsh economy, the Anglesey link?

Malcolm Wicks: I do. I know that part of the world. I know Anglesey and I know the importance of those plants to the local economy.

Q860 Albert Owen: On a more general issue, and again not wanting to upset you but just putting the question to you: many people have suggested that this Energy Review is a nuclear review. How do you respond to that?

Malcolm Wicks: Partly by saying it is not a kind of 19% review—in other words, nuclear is 19% of our electricity and obviously a smaller proportion of our total energy supply in this country, when you look at oil and so on—so it would be a bit daft, would it not, to have a partial review like that? It is a 100% review within the context of climate change. Within that, given the importance of nuclear now, given that nuclear has many advantages in terms of clean sources of energy, it would be foolish for us not to look at that very seriously. The Prime Minister has charged us to do that, and you have heard recent remarks by the Prime Minister. On the other hand, there are many public concerns about nuclear. There are huge issues about decommissioning, which we were discussing in terms of the legacy and waste. There are public fears in a terrorist age about the safety of nuclear. We have got to make a judgment. There is also the economics of it. Would commercial players come forward to invest in a new generation of nuclear? How does nuclear stack up against coal or gas? All of those issues are ones that my colleagues and I have been working on.

Q861 Albert Owen: So the difference between this review and a previous review with regard to nuclear is that the nuclear industry is asking for long-term stability so that private companies can invest: is that a fair analysis?
Malcolm Wicks: I think what is fair is that all the major companies that we have been talking to, and potential investors, are calling for long-term clarity on energy strategy, whether it is nuclear or any other form. The fact of the matter is that a lot of our power plants at the moment, the nuclear ones certainly but many of the coal-power plants, are old, and dirty and need to be replaced. Britain needs to invest a huge amount of money in power plants over the coming years. I think 30% of the power plants need to be invested in over the next few years. The industry, wisely, is calling for long-term clarity so that they can make investment decisions. That would certainly go for nuclear, if we go that way, and it goes for renewables and clean-coal technology and so on.

Q862 Mr David Jones: Minister, you mentioned that one of the issues that had to be addressed was whether commercial players would come in to build the new generation of nuclear power stations. One of the factors that they will have regard to in making that decision—probably the most important factor—is whether or not they have a guaranteed market and guaranteed price for their electricity over a sufficiently long period to make the exercise worthwhile. Would that not require some sort of government support or guarantee; and what consideration has your Department given to that?

Malcolm Wicks: No, it does not require that, and the nuclear industry is not going to get that. I just do not think that is where we are. Where we are, I think, is in an intellectually quite interesting position. On the one hand, there are some clear public-policy imperatives around climate and around energy supply and security, and other ones around fuel poverty, for example—but in a situation where we have a liberalised market, a privatised market in this country. It is about the commercial players understanding the public-policy framework over a very long period so that they can make investment decisions. What is important for government to do is to find ways of encouraging and incentivising clean forms of energy. I do not think it is for us to favour nuclear as opposed to renewables or the other way round; but if we produce that framework, based on the price of carbon—and we now have the EU’s Emissions Trading Scheme, which puts a price on carbon and enables players to trade—that is conceptually the way ahead in trying to incentivise clean forms of energy. It is not for us to intervene and say that nuclear energy should always have at least this price for twenty years; that would be absurd.

Q863 Mr David Jones: My concern is that during the course of our inquiry we visited power stations where turbines are not turning simply because of the vagaries of the price in the electricity market. Is that not going to be a disincentive to potential developers of nuclear power stations if they do not know whether the market can rely upon a guaranteed price—

Malcolm Wicks: Surely, that would have meant that there would have been no investment at all in the energy market because there has not been that guaranteed price, has there—

Q864 Mr David Jones: I just wondered whether those power stations we visited would have been built had the developers in those days been aware of the fact that the market would be so volatile.

Malcolm Wicks: What key players in the market place are telling us is that they do need the long-term certainty and some clarity about carbon so that we incentivise clean forms of energy that reduce emissions. They need that kind of framework, and I am confident that they will come forward and invest. Whether it is nuclear or something else will be essentially a commercial judgment. Although it would be foolish for an energy minister to predict energy prices, we are into an era of quite high prices in terms of the traditional fuels, not least gas. Therefore, the economics of nuclear doubtless look more favourable than they did a few years ago.

Q865 Nia Griffith: Obviously the Welsh Assembly Government has expressed a desire to make Wales nuclear-free. In the event that the Energy Review decides to go for new nuclear build, would you or would you be able to respect that wish in any way?

Malcolm Wicks: It is not where we are at the moment because my difficulty is that we are in the final weeks of the Energy Review and we need to make our final judgment on the nuclear question. It is not an easy question. It will be a judgment about what our country as a whole needs. We will make our judgment to the Prime Minister. The issue you raise is an important one, but I think it is a bit along the track. The situation at the moment is that the UK Government does have responsibility for power stations above a certain level in Wales.

Q866 Nia Griffith: Following on from that, many people in Wales have raised this issue: what would be the situation if Wales was defined as a geologically suitable area for a long-term repository of nuclear waste products? How would that fit with the Welsh Assembly Government responsibilities and the DTI responsibilities?

Malcolm Wicks: Our nation or nations as a whole have a duty, a very practical duty but I think an ethical duty, to finally get to grips with the legacy of nuclear waste. My own view is that governments and parliaments of different political hues and colours have dodged this issue for thirty or more years, and I think it is a disgrace. It is not taking responsibility seriously. People may not like the idea of the stuff, but it is a bit pathetic of any of us to say we do not think we should deal with the issue. We have to deal with the issue. We are awaiting a report of the expert committee known as the CoRWM Committee which is charged with looking at this issue of the long-term solution to nuclear waste. It is a very complex issue, and they have produced some preliminary findings already and will report by the end of July to the Secretary of State for Defra. It is a complex issue, and I do not think Government can
immediately say where it is going to go; but I think Government needs to signal its absolute conviction that we need to tackle this problem, and that is what we will do. We do not know where it is going to go yet, but it has to go somewhere. With energy policy you cannot just have everyone presenting you with a series of negatives—"no, we do not like nuclear" or "no, we do not want a wind farm here" or "we do not like the idea of this or that" or "we certainly do not want to have the waste here". Some responsible people need to come forward and say "yes" to a few things; otherwise, one day the good people of Wales and London will wake up and the lights will not go on and the showers will not work. There is a need for some collective responsibility.

Q867 Nia Griffith: Minister, you referred to the fact that we are in a very different situation from the time when power was decided by the government and there was government investment. Are you saying that in the event of new nuclear build it would be fully financed by the private sector and that there would be no taxpayers’ money going into that initial build?

Malcolm Wicks: Yes. The only qualification has to be that given that some nuclear waste lasts for a very, very, very long time, then the state would always have an ultimate responsibility for that; but there has to be means of getting the economics of nuclear right if that is what we want to do, to make sure that the investors can be paying for the final disposal of nuclear waste.

Q868 Nia Griffith: So you would be including that in the initial costs. You would be asking them to include something towards waste disposal.

Malcolm Wicks: One has got to look at that if that is where we are going, yes.

Q869 Mark Williams: Following on from that, I appreciate this very fluid base and that the economics are ongoing and changing all the time. What costs are we talking about decommissioning-wise in the UK? What kind of figures is the Department working on at the moment?

Malcolm Wicks: Something of the order of 50-60 billions over maybe 50 years; but it is set out in the NDA’s strategy. I am advised that the cost of the nuclear legacy is about 63 billions, so I am roughly right, but there are certain unknowns. I doubt whether that would be the definitive figure. This, by the way, is not to be paid this year—it is over a 50-year period or something of that order. The public spending earmarked for this year might be 2 billion but again I will check on that. I would rather that these figures were absolutely accurate rather than me just trying to remember. It is of that order. It is very significant.

Q870 Albert Owen: My colleague Nia Griffith asked a question about the industry paying for it and there being a level playing-field—is what you are trying to say—with renewables for the future if the Review were to come out pro-nuclear, with everything taken equal. When we talk about decommissioning, on the other side of the argument for renewables, there is a renewable obligations paid, which is £1 billion a year now, so there are costs in developing renewables as well from the state as well as from industry. Is that correct?

Malcolm Wicks: I think conceptually where we need to move to—and “we” might be not just Britain but the European Union and you could see the EU Emissions Trading Scheme developing maybe—although it has hiccups and problems at the moment—into a more international emissions trading scheme. There is no particular reason why only members of the European Union need be members one day. I am not talking about next year. It is where we need to move to; a place where any technology, any scheme that reduces carbon emissions, could be similarly recognised and incentivised. As a policy goal that is where I would be at the moment. Therefore, that would be the famous level-playing field, and it would be treating the micro wind turbine on one’s dwelling in the same way as maybe clean-coal technology or carbon capture and storage, or nuclear, et cetera. Conceptually I do not think that is a bad place to try and think through. Whether there are any practical impediments to that, we need to think through yes? That is where we probably want to be. Within that context I do not think it is inconsistent to say that in the early days of renewables, when you are trying to get them out of the laboratory, as it were, into testing and into the market place, that you do not do special things through Renewables Obligations and grant aid, through the Marine Fund and so on—for renewables I am talking about. I do not think that is inconsistent with the long-term objective we might want to set ourselves.

Q871 Mrs James: I would like to turn to coal and clean-coal technology. When the Committee visited Tower Colliery we were told of many new potential developments for coal that were being hindered by the absence of any real investment. Why does UK coal continue to be the poor relation of energy sources?

Malcolm Wicks: Obviously, one needs to distinguish—as I think you have by implication—between British indigenous coal, which is here, and coal as a fuel source. My colleague Clare Harding, who is our expert, will correct me if I get this wrong and may want to come in at the end of my answer. At the moment, maybe 30% of our electricity a year is fuelled from coal—the average annual position. In winter it is much more. Interestingly enough, this past winter, which was difficult with gas prices being so high and the tight situation we are in—I think, Clare, for a couple of months maybe 50% of electricity was coming from coal.

Ms Harding: That is correct; from December 2005 through to March 2006 coal contributed an average of 50% of the generating . . .

Malcolm Wicks: Most of our coal is imported.

Ms Harding: The majority of the coal is imported, including the generating . . .
Malcolm Wicks: Yes, my colleague is confirming that so far I am getting a B-plus and not necessarily a very competent A-minus! Most of our coal is imported. There is the conundrum, if you like. I have asked myself this question several times of colleagues and experts because it does not seem to make sense that importing coal often from as far away as Australia is economically more sensible than exploiting our natural resources—but that does seem to be the situation. Can I ask Clare Harding to deal with the point about the relative costs of imports as opposed to indigenous?

Q872 Chairman: Can we make sure that we raise our voices because some people are having difficulty in hearing.

Malcolm Wicks: And at this end actually as well—but I heard that, Chairman.

Ms Harding: With regard to the price of coal for generating, I have had some figures before me this morning which suggest that the price of imports over 2005 were in the order of 1.60 per gigajoule, which is how coal for generating is priced. It was even higher than that in 2004. The price that is being paid for UK coal is in the order of 1.30 per gigajoule.

Q873 Chairman: You are getting quieter!

Ms Harding: That is where my Welsh blood does not come in! At present UK coal is earning prices which are significantly below what it costs to bring imported coal in. This is a reaction to recent changes particularly in gas prices, which have upset the energy markets world-wide; and also the increase in demand for coal in China and India, which have driven coal prices upwards.

Q874 Mrs James: Is it sensible to turn our back on this source of energy really, Minister? We have millions of tonnes of coal here in Britain. We know where it is and how to get at it; and in a long-term energy strategy should we be finding ways of using it?

Malcolm Wicks: That would seem to be common sense, and the lay person would say just what you have said; that there is all this stuff still under the ground, and surely, it is a British resource, and with clean-coal technology—because we need to bring that into the story here—surely there must be a future! The hard-headed people in the commercial world will say: “We have a duty to the customer in terms of price and at the moment the price is not right and it is cheaper to import.” That is the difficulty. I would hope that there could be some future for British coal by bringing into play clean-coal technology. I would hope that, but I suppose the less Romanic person would turn your question around and ask if it is really sensible to buy one source of coal that is more expensive than another; and who should pay that cost? Government has worked quite a lot with Coal Investment Aid to support certain pits and so on. It does not seem to have worked in terms of a long-term viable strategy—and who would pay the cost; should it be the customer?

Q875 Mrs James: Sorry, I might have misunderstood Ms Harding’s figures. She quoted £1.60 per gigajoule. Is it not £1.30 per gigajoule of British coal?

Ms Harding: I can confirm that is indeed the way it is. It is the conundrum that faces particularly the deep mine sector at present, that they are tied into contracts at prices which are below world prices. If they were able to get more for their coal, they would be better able to invest and continue to produce coal for the future. The open cast sector’s production cost is in the order of £1.24 or £1.28 per gigajoule, that is a very average price, so they are cheaper than the world market consistently.

There is a considerable supply of shallow coal that could be mined in this country if there were access to it.

Q876 Mrs James: I am very hesitant about that because of the environmental issues.

Malcolm Wicks: Perhaps, Chairman, it might be helpful if we send you a note to clarify that because the detailed arithmetic is important both in terms of the costs of British coal as opposed to other sources. The trend is quite interesting in the last 10 years and the issue we have said around long-term contracts which is a particular problem at the moment.

Q877 Nia Griffith: Minister, as you said, certainly in our journeys around Wales, the installations that we saw were ageing and had not received significant investment since the 1960s and 1970s. As far as the issue of coal is concerned, in my own constituency, the Cynheidre Fawr seam was prepared for exploitation because there was an enormous amount of money invested just before the Thatcher Government decided to close down the mines altogether. It just seems to me if this price differential is now in favour of UK coal and what is against our coal is the fact that there are contracts which have to be worked through, then is there not a case for some investment and development of this coal? The people from Tower Colliery were quite clear that if there were financial assistance for exploration and identification and getting the start-up cost, if you like, then really coal is a winner. Given on the world market coal is not going to go down in price, it seems it is a win-win situation if we were to exploit the coal.

Malcolm Wicks: The question would be, who would fund that? As I say, there has been quite significant Coal Investment Aid. Clare, how much, if I can ask through the Chairman?

Ms Harding: £3 million has been awarded to Tower itself to keep it in operation despite the fact that it will reach exhaustion in 2007 or 2008. We felt it was important that the remaining coal should be worked at all possible.

Q878 Nia Griffith: That is a very important point. Supposing they got £1.50 a gigajoule instead of £1.30, then they would have money over for investment. Given you have not got that at the minute, the crucial things I think from the point of view of the future of our industry is we should
develop new seams before the skills disappear and the workforce should be trained up so we can exploit new seams.

Malcolm Wicks: It seems to me the future for British indigenous coal has to be about whether by developing, making use of clean coal technology and by doing the right deals with the generating companies—it is not for Government to do that—there can be a future on its own merits. I do not think any companies, of a kind of new seams. to keep on trying through coal investment aid to keep this pit or that pit open. We are at a very interesting time in terms of coal in Britain. We had the sad news yesterday that Haworth Colliery elsewhere in Britain, not in Wales of course, has been mothballed. That was sad news. There are other signs, I think, with some companies, of a kind of new entrepreneurship and new hope, so we are at a critical point. I would caution against an idea that another £50 million here or whatever is the answer to this problem. I think we have to look for other solutions.

Q879 Nia Griffith: Would you not agree, given the specific situation we are in, a subsidy at this stage might possibly then have payback in the future?

Ms Harding: If I may, I would quote the example of Aberpergwm Colliery which was prepared for investment that then stopped, I think, in the late 1980s. But the same aid package, the Coal Investment Aid, has been given to Aberpergwm; £3.5 million was given to support the reopening of that colliery. As a result of the seed capital that represented (it is paid up to 30% reimbursement of the investment as it goes forward), Coal Investment Aid having supported the initial stages of that investment, the company has now attracted significant new financing which should enable that project to go forward and should enable that mine to come into full production within the next 12 to 18 months. That will be an opportunity for people to move possibly from Tower into another deep mine with good long-term prospects. There is also the Margam coking coal prospect adjacent to the steel works in Margam for which I understand Corus have been awarded a licence in principle, and the project is currently in planning with the local authorities. Again, it is a project which could result in a new deep mine and a continuation of deep mining in south Wales. In that case, it is coking coal and the likely developer will be the end-user and, therefore, there is not a case for any intervention in investment in the project.

Q880 Mrs James: It is very interesting because earlier in your answer to me, Minister, you mentioned the huge amount of investment that you have already made. Surely to goodness, with the situation with energy in the world, all the problems we are all facing and the huge demands of North America, India and China, we have already started supporting coal and we need to continue the support. Andrew Davies told this Committee that in broad policy terms we have supported the development of deep mining and now we must keep the faith and continue with that.

Malcolm Wicks: Yes, but with indigenous oil and gas there was no direct government subsidy. As I say, I think part of the answer lies in issues around putting a price on carbon and developing clean coal technology.

Q881 Chairman: At the risk of being provocative on this, there are two things that occur to me. This Government has made a commitment to support the British car industry. It may have economic, political or commercial reasons behind that, but it occurs to me that when you answered the question about the long-term future of the coal industry, you answered it entirely in terms of commercial reasons rather than putting it into the context of long-term energy supplies. We are now facing a situation, as you acknowledge, that most of our coal is coming from abroad. It is quite conceivable those prices, because of the global situation, could rise whereas we have a security of supply here in south Wales, but we may not be able to access it. If the investment does not occur in significant amounts now, then we lose the skilled labour force. Why is it that you are not treating coal in the same way as the other sectors which are measured in terms of security of supply? You quite rightly point out that we do not want to be over-supplied with oil and gas; the same argument surely applies to coal?

Malcolm Wicks: Yes, but with indigenous oil and gas there was no direct government subsidy. As I say, I think part of the answer lies in issues around putting a price on carbon and developing clean coal technology.

Q882 Chairman: Previously, the governments in the 1970s pioneered clean coal technology; the British coal industry was a world leader. We are now trading behind in terms of clean coal technology. The Labour governments of the 1970s encouraged it. We are not exactly pioneers in this field any longer.

Malcolm Wicks: We have £35 million for a carbon abatement programme which will be sponsoring a number of quite small-scale projects to develop this kind of technology. There are now one or two commercial plans to exploit clean coal technology in this country. One of the companies, Eon for example, has aspirations in this area, so I think it is quite a lively time in this area. I am just reluctant to go with what might seem to be the easy but expensive option of saying a new public spending programme is the answer to the British coal industry. I personally do not think it is. I think it is more complex and challenging than that. If you were calling for more public spending, and I do not think your Committee will, you would have to balance...
that against public spending maybe on other forms of renewables which might also hit some of these topics.

Q883 Nia Griffith: Excuse me, Minister, could I take up the point of Ms Harding, your senior adviser. There does seem to be a good return now, given the way the prices and money markets are going on this one. That investment in Aberpergwm now seems to be bearing fruit and, therefore, it may not be just a bottomless pit of public money, it may be that you are getting a return on that public money?

Malcolm Wicks: Yes. I guess some people would say that is a strategy that has been tried now for a number of years and so far does not seem to have been producing results. I think I would return to the idea that if we can get the framework right, then commercial operators can make commercial judgments about this.

Q884 Chairman: Tower, with respect, has been a remarkable success. I do not think this Government would deny that or the previous Conservative Government. They supported Tower as being in its time a remarkable achievement, did they not? Why do you not reflect on this Government's commitment to public-private partnership in other sectors such as health and transport and so on? Why do you not experiment a little more in coal?

Malcolm Wicks: We will reflect on all these issues with the Energy Review drawing to a conclusion, but I wonder whether your Committee would urge us to put our public money there rather than in, I do not know, marine renewables, biomass or heat pumps? If we are looking to the future, where would the priorities lie?

Chairman: We are coming to that now.

Q885 Mr David Jones: I think, Minister, to answer your last rhetorical question, this Committee is probably more concerned about security of supply than almost anything else. As you rightly said, we are now entering an age where we are increasingly reliant on imported coal and imported gas from countries such as Russia, which had no compunction at all about turning on the taps to Ukraine last winter, and from the Persian Gulf, which is not exactly the most stable corner of the world. When we visited the United States we found a very buoyant coal industry, very optimistic, which was having enormous government funding for clean coal technology. You mentioned a figure of £35 million, which frankly pales into almost nothing compared with the investment in the United States. I am sure the answer is much more complicated. We went to a power station called Torei and they told us they were burning lots of imported coal, but that they would sort, some pump priming money, into the coal technology industry as something that would be beneficial in the long term if only to do something to secure security of supply?

Malcolm Wicks: I do remember the recent history of coal and politics, Mr Jones, and, of course, we are now where we are because of actions taken by a previous Conservative government.
people who might be listening to us here today, why can the Government not do something about that, or is your choice to allow the markets to rule? Could you give us an answer? Are you in favour of letting the markets rule—it seems to me to be what you are saying—or can the Government do anything at all about that? Apparently, it is simple situation: there is cheap coal on the doorstep and people want to burn it. That is what is happening.

Malcolm Wicks: Obviously not terribly adequately, and you can nod at this stage, but I am trying to give four or five answers to very similar questions that have been put to me. I have been trying to put forward the argument that we have had coal investment aid and that has helped Tower Colliery and so on. I guess the objective commentator would say it has not, nevertheless, secured the long-term future that we are all looking for. What I am arguing now is we probably should not be looking at, even if we could afford it, another public expenditure programme. We should look at producing the right framework for all forms of clean energy, which would allow commercial judgments to be made.

Q891 Hywel Williams: When we visited Aberthaw, they also told us that they used to burn tallow, but apparently the regulations have changed and they are no longer allowed to burn tallow. Is there any prospect that they might be allowed to use it, if it was a fuel they wanted to burn? Secondly, they told us that the agricultural industry can, in fact, burn tallow. Could you clear that up?

Malcolm Wicks: I do not think we can at the moment. We will have to come back to you on that one, I am afraid.

Q892 Mark Williams: Turning now to the issue of biomass, I am interested in how the recommendations of the Biomass Taskforce under Sir Ben Gill are being addressed and delivered in Wales?

Malcolm Wicks: There has been a government response to the Biomass Taskforce which, Chairman, I think your Committee will have had copies of or we can make sure Defra will send you those copies. We see biomass alongside the other renewable technologies as a very exciting prospect. There are different uses, one of which, of course, is the development of biofuels and, as you know, the Department for Transport certainly here has said we would like in the future 5% of the fuel we use for our motor cars to come from biomass. I think that is a very clear indicator of how the market might go in terms of biofuels. There are, of course, all sorts of other uses which we think will be exploited in the future.

Q893 Mark Williams: In the Taskforce report they envisage a million hectares, eight million tons of energy crop or your 5% figure. Where are we on those figures now? Are we meeting those targets? How far have we got to go to achieve it? On the targets that the Taskforce envisages, they talked in terms of one million hectares or producing eight million tons of energy crop.

Malcolm Wicks: The Taskforce has only recently reported, yes?

Q894 Mark Williams: Where are we, though, as a starting point then?

Malcolm Wicks: I mentioned where we are on biofuels, not where we are but where we hope to be. In terms of the rest of the Taskforce’s proposals, it is obviously very early days.

Mr Wagstaff: I have got a figure here, which I think comes from the report itself, which said in 2003 in terms of heat generation biomass energy was about 1%. As the Minister said, there is much more detail in Ben Gill’s report itself.

Malcolm Wicks: There is an issue also in terms of the power stations, DRAX I think it is, in terms of co-firing using biomass. There are arguments about what would be an appropriate percentage for co-firing, given other issues around the Renewables Obligation. I have recently asked colleagues to review that to see whether or not we are in the right place on that.

Q895 Mark Williams: We took evidence from the Institute of Grassland and Environmental Research which is in my constituency. Dr Valentine, who has done a great deal of work on biomass there, felt very strongly that biomass was not reaching its full potential because of, and I quote his words, “ignorance of the potential, it was perceived as complex or high risk, a lack of policy clarity and a fragmented approach from Government” on biomass. How would you respond to that criticism?

Malcolm Wicks: I think I would respond to that criticism by acknowledging that, although some of these ideas have been around for a very long time, in terms of government this is still very early days. We are committed to it, hence we established the Taskforce after all. We have issued our own response to the Taskforce and in the Energy Review we are looking at some of those issues. It may be helpful, Chairman, if my colleague, David Wagstaff, could mention some specific developments in Wales.

Q896 Mark Williams: That was my next question, so yes, please.

Mr Wagstaff: This is not an exhaustive answer, but certainly there are one or two things we are supporting in Wales. Our capital grants scheme has supported the western bioenergy development which is at Port Talbot, I think, and that is to the tune of about £4.6 million. There is also the Wales biocluster heat project which is just under half a million. There are a couple of things there. I am sure if you want to know more detail, we can provide it for you.

Q897 Mr Martyn Jones: When we were at Aberthaw, Minister, we saw the Renewables Obligation was skewing the use of clean sawdust there. I know you are aware of the issue, that is also a feedstock in the chipboard and wood panel industry. Given that we are talking about biomass, which Mr Williams has asked questions about, how can we use the Renewables Obligation Certificate or some
other method or mechanism to make sure that what we are using is genuinely renewable biomass grown specifically for the purpose? I am sure that is what is intended in the first place, but we have an unintended consequence in the wood panel industry at the moment.

Malcolm Wicks: As I have said, because I work with complexities here, although every week that passes, I am aware of more complexities, I have asked my colleagues to do a relatively quick review on the co-firing issue because, on the one hand, you will get power plants saying, “We would like to increase and benefit from the Renewables Obligation the amount of biomass that we can use”, bits of products from timber manufacturing for example, so some of it points that way. You have other people saying, “No, this will skew the Renewables Obligation. This was not meant to support traditional power plants, it was meant for all sorts of other things, marine technology and so on”. Then, of course, more recently I have been introduced to the very important perspective about the implications for some of those producing furniture and so on who now feel they cannot use that material because it is being used for biomass. It is not an easy place to be which is why we are looking at it. No doubt we will do our best to make a wise judgment, which will please at least one-third of the audience and a fewer proportion of MPs.

Q899 Mrs James: I am now coming to something else I am particularly interested in, wave and tidal power. Representatives from the Welsh Energy Research Centre agreed that while the UK could be a world leader in developing wave and tidal technologies, that we were “in danger of missing the boat” unless we take the lead now. How will you avoid this danger?

Malcolm Wicks: I will not repeat the phrase “missing the boat”. As I said earlier, this is an example of one of those technologies which is more the other end of the continuum from, say, onshore wind. It certainly is a technology that has enormous potential that needs encouragement and not just pats on the back; it needs financial support. DTI have been providing financial support in the past and recently we have announced £50 million for, I think what we call, the “Marine Development Fund” for this very purpose. I am aware within Great Britain there are a number of centres of excellence and certainly great innovation and entrepreneurship at different stages of development. In Fife Ocean Power has very advanced technology which has been tested in the water for a number of hours or a number of days but not yet been fully tested. I think that is where we are. I do not think at the moment you can necessarily say, “Yes, in the next few years this will prove its commercial worth”. I think what you can say is there is a lot of excitement, a lot of interest, huge amounts of skill and technological brilliance. We have just got to try and ensure we will do our very best to help bring these things into the commercial market because obviously it is right that if Britain can become a world leader on marine renewables, that would be the right ambition for us to have. I think at the moment, yes, we have got the Renewables Obligation but also this grant aid and I think we are doing our best.

Q900 Mrs James: Witnesses identified several areas where the Government needs to act in order to effectively harness wave and tidal energies, not least in providing a clear lead addressing ambiguities around offshore planning and promoting long-term investment. What steps is the Government taking to address both these issues?

Malcolm Wicks: Defra, our colleague department, are addressing some of the issues around planning, for example, with the Marine Bill and the concept of marine spatial planning. The idea that just as we had onshore planning for a number of generations, or a century or more, we now need to look at the traffic of different kinds and different uses of our seas. Ben Bradshaw of Defra is leading on those issues and we need to make sure that as the voice of renewables of different kinds, offshore wind, that what we are talking about now, the marine technologies, are part of that planning issue because there is a lot of competition out there for the use of the seas. All sorts of interest groups have beaten a path to my door to plead their case, and not just to plead their case but also the case against others who want to use the seas.
Q901 Mrs James: One of my particular interests is tidal lagoon schemes, and previous witnesses have highlighted the fact that, in spite of the technical feasibility of tidal lagoon schemes and a combination of misunderstandings and comparing apples and pears of the costs et cetera, saying that the technology is too expensive at this moment in time, it has significantly delayed any government approval or support for them. Having finally completed a correct appraisal of schemes, such as the tidal lagoon in Swansea, what is the Government planning to do to make up for lost time? How will the DTI help restore investor confidence in those people who would have been happy to invest but hearing it was too expensive and the technology was untried have now backed off?

Malcolm Wicks: I look at my note here, I would not pretend to be an expert on tidal lagoons. It is one of those ideas that seems sound. I think the difficulty, as ever I am afraid, is that independent assessments have been commissioned by both my Department and the Welsh Assembly suggest the economics of lagoon schemes are not favourable. However, if claims favouring the economics of the scheme by tidal electric are correct and the project is sound, we would, of course, expect the commercial sector to come forward. If something is feasible economically, then you would expect the investment to flow from that. The other thing I would say is that we have worked closely with the Welsh Assembly Government to review the economics of the Swansea Bay scheme, which I am advised do not appear favourable at the moment. I think that is where we are. Again, Chairman, if it would be helpful for us to send you a fuller note on this, I will. All of these things, in my experience, are always heavily contested of course; someone will do one analysis, and someone will then say, “No, the arithmetic is wrong” and so on and it should be given a fair chance. In the framework within which we are operating, if something appears to the advocates of the scheme to be favourable, you would expect the investment to be there in the marketplace.

Q902 Mrs James: My understanding was the investment was there, that there was significant evaluation, and that evaluation was undertaken by respected and well-known organisations?

Malcolm Wicks: Which scheme are you talking about?

Q903 Mrs James: This is the Tidal Electric scheme which has created a huge amount of interest locally in Swansea.

Malcolm Wicks: I think I had better write on that one. I know it is an important idea, but I think I had better write on that one.

Q904 Nia Griffith: If I could thank you, Minister, because you have agreed to meet with Sian and me on Monday on this very issue. Could you perhaps confirm that if there is a company such as Tidal Electric, who can give us assurances that they are doing this on private money, then would it be something that the DTI would look favourably on?

Malcolm Wicks: I just need to be cautious here because of planning issues, do I not? I think it is right that I am. I am favourable towards renewable energy and I am struck by the fact that there are a range of schemes, ideas and technologies that are now coming forward and I am terribly encouraged by that. It is for others really to look at the economics of it. In terms of a particular scheme, then there is our old friend, planning law, and decisions around that and public opinion and so on. The particular issues in Wales, the Devolved Administrations, some issues in England, so I do not think it would be sensible for me to say, “In the right circumstances I support scheme X” because one might need to be involved in a judgment about that later.

Q905 Mr David Jones: I am grateful to you for your offer of a note, Minister, and when you submit your note, possibly you could consider the proposal that has been made recently for a larger scheme off the coast of north Wales which would be for a tidal power station that would generate over 400 megawatts which, of course, would be entirely within your Department’s competence. Possibly, when you address the Swansea Bay issue, you could ask your officials to consider the north Wales proposal as well?

Malcolm Wicks: I will try to touch on that. Again, I should make it clear in terms of where we are, the respective roles of government and the commercial sector, it is not for me, as Energy Minister particularly, to say “Someone has told me about a new offshore wind thing or a new heat pump, are you in favour of it or not?” That is not where we are.

Q906 Mr David Jones: I think that the proponents of that proposal fully accept that. I think that their concern was that there was a DTI report that was very unfavourable, in fact dismissive, of tidal power which has to a certain extent been rectified now and taken on board the report of WS Atkins. If you are preparing your note, possibly you could incorporate a note on the Swansea Bay proposals.

Malcolm Wicks: I will see what I can say on that. Chairman: We are gradually moving around the investment was there, that there was significant evaluation, and that evaluation was undertaken by respected and well-known organisations?

Q907 Albert Owen: An exciting project that stirred up a lot of interest in Wales and proponents of it suggest that it could contribute some 5% of the UK’s energy needs. It is carbon-neutral, totally renewable and the kind of scheme the Government is looking for in its review. Has there been an official submission from the Welsh Assembly Government and will you be making a decision in the written review?

Malcolm Wicks: I have had a meeting with some of the key players, very much for me simply to inform myself about an idea which, I understand, has been around for some while that has been controversial, and probably still is, but which now has some quite powerful players supporting it. Yes, the review team is looking at it, but again, at the risk of repeating myself rather, it would not be in any case for us to say “Yes, that is great and here is a cheque”, rather
a large one, or “No, we do not like it”. It is not like that. It is a question of whether in the right circumstances the thing would be acceptable in terms of planning law. There are environmental considerations. I think possibly different environmentalists will argue it both ways: some would say it will enable a greater sort of diversity of species to blossom, or whatever that species do, and some say “No, it would be a threat to existing bird life”, maybe. So obviously, as ever, these things are controversial, but I am interested in it because 5% is a very considerable proportion in terms of what we are about, but I think I need to be a bit cautious at this stage.

Q908 Albert Owen: I fully understand the reasons you have given but, all things being equal, this is the kind of scheme you are looking for for the future energy needs of the United Kingdom, a barrage that can produce 5%. Secondly, going back over some of the questions you were asked, this is an idea from the Welsh Assembly Government that has regional implications. What I am trying to ask you is (a) is this the type of scheme that you would think is acceptable for the future in the green Energy Review, and (b) the fact that the Welsh Assembly Government’s proposal adds a bit of weight?

Malcolm Wicks: Certainly, the representations I have had add weight, yes, because, as I say, some powerful players are really very interested in this. I do think, Mr Owen, through you, Chairman, we are going to need some boldness about both energy supply and climate change. To hit our targets does not involve a series of very cautious steps; it needs some major step changes in terms of how we use and stop abusing energy and in terms of the investments we need to make. I am encouraged when people come forward with ambitious ideas. Whether they are acceptable to local public opinions is another matter, their environmental impact is something I do not have the expertise to judge on, but the fact that interesting and sometimes exciting ideas now are coming forward either in terms of small-scale micro-generation or the larger-scale projects is something I find encouraging, of course I do.

Q909 Chairman: You are in the home straight now, you will be pleased to know. We want to move on to wind energy, and Dr Constable of the Renewable Energy Foundation expressed some concern about the fact that UK energy policy seemed to be regionally tailored and he said this: “[energy policy] tends to regard renewable energy resources . . . in Scotland and Wales for example, as common UK properties to be exploited at will. While we accept of course that the overall national good may be seen as having weight in this context, we are concerned that particularly in relation to renewable energy resources, this breaches what we take as a golden rule of sustainable development, which is that a development should benefit all parties at the relevant proximate level; and that distal benefits . . . should not be invoked . . . carelessly”. How would you respond to that criticism?

Malcolm Wicks: Is he or she arguing that essentially the wind turbine should simply fuel the electricity for the immediate community? Is that the gist of that argument?

Q910 Chairman: It could be.

Malcolm Wicks: Yes. Two kinds of answers really that maybe point in either direction, but that is all right. One side is we need a UK energy strategy. We need to think about our countries together. We have grid networks that reflect that and also, of course, one is aware that, take the contentious issue of existing nuclear power stations, they are often in communities which do not have around them large urban areas using all the electricity that is produced and they feed in perfectly properly to the national grid. There are particular issues I think in northern Scotland and the islands, the Western Isles and the other islands, the Shetlands that have a huge wind resource but, of course, much of the demand for energy, increasing demand, is coming from around here in southern England. We need to think through the implications of that for transmission. I think the only other I would say that points in the other direction is that we are going to see quite often small-scale local generation in the future, micro-generation. In the next 20 years or so, we are going to see thousands of energy flowers blossom in terms of micro-wind turbines on our dwellings and, I hope, on our schools, maybe as a way of educating our children about their relationship to energy, and energy’s relationship to the planet, on village halls and so on. That development of local generation, often on quite a small-scale level, raises interesting issues about the grid system and local wiring systems that we need, so I understand that but I think these two things are complementary. In other words, we need to produce power to feed into the National Grid, but we also need more forms of local generation using micro-wind turbines, photovoltaics, heat pumps and the rest.

Q911 Chairman: I think you may have answered the next question, but could we have your observation on this question of broad strategic terms and the balance between overall national good and principles of sustainable development, in particular with regard to wind energy in Wales? There seems to be a sense in Wales amongst certain people that wind power seems to be the only way forward in terms of renewables. In renewables in particular, it was described to us by one witness as why it is we seem to have gone for wind energy, and the answer was it is low-hanging fruit and it is easily accessible because the development has been undertaken.

Malcolm Wicks: Yes. I think why onshore wind is proving itself is because it has now got a reasonable history behind it, there has been a quite a lot of investment in other countries, in Scandinavia and so on and it is a proven technology. It is, therefore, an obvious one for the developers to look towards. I will not repeat the earlier discussion, but the challenge now is to make sure we can incentivise other forms of renewables that have a chance of proving themselves. I do not see the future of
renewables as simply about windmills, I see it as about encouraging biomass and these other technologies. I do not see the climate change challenge as one which we face up to simply through renewables, frankly. I know there is a school of thought that thinks with lots of nice renewables and more energy efficiency that solves the energy problem. Well, no, sir, that is not the only way to solve the energy problem, it will not fully do it, which is why we have to take nuclear seriously as an option, it is why we need a lot of investment in carbon capture and storage—another select committee of this House has produced a very useful report on that—it is clean coal technology and the rest. There a whole menu of issues we need to grapple with if we are to meet the challenge of global warming.

Q912 Mark Williams: Large wind farms such as the Rhyl Flats area come under your authority as they are schemes over 50 megawatts. When we were in north Wales, we came up against significant opposition to that development. Do you feel arrangements are adequate for consultation with local people on such large schemes and ultimately come forward in your authority?

Malcolm Wicks: I am just looking at my note on this, but I am aware of this. Maybe I have been in correspondence with you, Mr Williams, on this and other people. I am aware of concern, as you say, opponents claiming that the consent for the project should be revoked because the consultation process was flawed. We have rejected such claims. We granted the consent after a full and proper consideration of all the issues brought to the attention of the Secretary of State during a consultation process. That is our position on that one. We do not think there is any scope for reopening that particular argument.

Q913 Mark Williams: Do you feel the avenues for local residents to make their views are robust enough?

Malcolm Wicks: I do, but there is no point in being complacent about things. If there is room for improvement, we will want to discuss those possibilities.

Q914 Mr David Jones: Actually, Minister, I am the chap you have been in correspondence with over the Rhyl Flats. You will recall that one of the concerns I expressed on behalf of my constituents was in connection with the statutory notice that appeared in local newspapers, which described the development as being on the Rhyl Flats whereas, in fact, it is not on the Rhyl Flats, it is on another identified area of the seabed called the Constable Bank. In fact, it is not only described as that by me, but it is also described by RWE npower website as being on the Constable Bank. The concern, of course, was that residents were misled into thinking that the development was in an entirely different location from where it is. In fact, it is a few miles off the coast of Rhos-on-Sea in my constituency and quite a long way from Rhyl. You indicated that the co-ordinates of the scheme would have been apparent to anybody who had inspected the application, but would you not accept the criticism that in the case of large-scale windfarm developments such as this, it is essential that the statutory notice that appears in the local newspaper should, as far as possible, accurately identify the location of the development? Would you not accept the criticism that in this particular case it was not a sufficient indication of its location?

Malcolm Wicks: I do not think I will accept that is why we have to take nuclear seriously as an option, it is why we need a lot of investment in carbon capture and storage—another select committee of this House has produced a very useful report on that—it is clean coal technology and the rest. There a whole menu of issues we need to grapple with if we are to meet the challenge of global warming.

Q915 Mr David Jones: The question was do you think that the statutory notice should, so far as possible, accurately identify the location of the proposed development?

Malcolm Wicks: Yes, of course.

Q916 Mr David Jones: Would you accept that in this particular case it did not?

Malcolm Wicks: No, I will not accept that.

Q917 Mr David Jones: You will not accept that?

Malcolm Wicks: I do not think I can add usefully to the correspondence we have had on this matter.

Q918 Mr David Jones: You would not consider a review of the consent application?

Malcolm Wicks: No.

Q919 Mr David Jones: Would you agree that to give misleading information in statutory notices does nothing to improve the confidence of the public in the consent process?

Malcolm Wicks: I am aware that there was a consultation process. As with all these things some people will be pleased by the outcome, some not pleased, and you are ably representing those who did not like the result.

Q920 Mr David Jones: You are not listening to me.

Malcolm Wicks: That is your argument, I know.

Q921 Chairman: Could we come back to the wider picture of wind energy.

Malcolm Wicks: Yes.

Q922 Chairman: Would it be a useful suggestion that some of the heat could be taken out of the arguments or the public feeling if DTI—

Malcolm Wicks: It sounds like a combined heat and power project you are suggesting, Chairman! We can discuss that if you like.

Q923 Chairman: You have not lost your humour at this late stage. Can you provide some facts and figures about the contribution that wind energy can make and put it into a more sober context?
Malcolm Wicks: I suppose in principle it can make a huge percentage contribution. At the moment we are trying to hit a target of 10% by the end of this decade. At the moment, I think I am right in saying that of the new developments coming forward, most will be wind energy. To hit that 10% target, you will mainly do it through wind energy, but if I can be more specific in writing, I will be. After that, up to 2020 when we would like maybe a fifth of our electricity to come from renewables, I am not sure it would be very sensible for me to try to produce a proportion out of the air.

Q924 Chairman: It would be helpful if you could write to us and also write to us with some facts and figures on the distinction between base load provision of energy and other provision of energy, and also the difference between capacity and output.

Malcolm Wicks: Yes.

Q925 Hywel Williams: Can you tell us broadly what considerations are given to the visual impact of large-scale developments offshore. There is a proposal at Gwynt y Mor, for example, and it has been alleged that would have a detrimental effect on tourism. How heavy does that sort of consideration weigh, do you think, when planning consents are considered?

Malcolm Wicks: I am satisfied that there is a very rigorous process of consultation in terms of planning law which looks at all the things you would expect to be looked at: the environmental considerations, some of these considerations about other users of the sea, shipping, some of the shippers sometimes have concerns about particular projects, all of those issues and then, of course, the general visual impact will obviously be taken into account.

Q926 Hywel Williams: This is a comment really. We did meet some people from the tourism industry who are extremely unhappy with the potential visual impact and felt their particular industry, which is a key local industry in Mr Jones’ constituency, and mine for that matter, was affected by a windfarm. They felt locally they were not being taken proper account of. I am telling you that as a comment. That is where that particular question comes from.

Malcolm Wicks: I know from decisions I have had to take about England, if I can introduce that foreign country into our considerations here, when I agreed with the inspector there should be a windfarm at Romney Marsh, many people applauded the decision but other commentators called me a vandal. I had no reason to second-guess the inspector on that, I looked at it carefully. Again, I agreed with the inspector for Winash near the Lake District in the Yorkshire Dales, I agreed it should go ahead. Some so-called environmental groups thought I was being totally irresponsible. You cannot get these things right except, it seems to me, it is possible to maintain the stance to say we are pro-renewables but we will judge each one on its merits.

Q927 Hywel Williams: Certainly, that is the stance that I take, being very much in favour of renewables but wanting to carry the population’s views.

Malcolm Wicks: All the time remembering, Mr Williams, the obvious point I made earlier which is not just a rhetorical point, it is a rather serious point. I am not talking about your scheme, because I do not want to make a judgment about that one, but those people looking offshore who are onshore, saying they do not like that will be living in homes and staying in hotels where they will want hot showers in the morning and want the lights to go on. All of us, as Members of Parliament, cannot find ourselves in a position where we will oppose any development that is going to secure our energy in the future. From time to time, we have got to say “yes” to things.

Q928 Hywel Williams: Just to refer back to the question that the Chairman asked you earlier on about publishing or providing full information. Again, perhaps this as a comment. As much information about facts and figures before planning consent is considered would seem to me to be a very good way forward. Is that the stance that you and your Government take, that full information, as full as possible, should be provided beforehand?

Malcolm Wicks: During the planning inquiry?

Q929 Hywel Williams: Yes.

Malcolm Wicks: Of course.

Q930 Mr David Jones: One concern, Minister, on the question of offshore windfarms is that, as you know, the Scarweather Sands Programme for south Wales is not being pursued because of economic difficulties, developers have decided it is not economically viable in the current climate. Do you think it wise to continue issuing consents under the Electricity Act for further applications when the current stock of consent is not being utilised when proposals such as Scarweather Sands are not being pursued by the developers because of those economic reasons?

Malcolm Wicks: I am certainly concerned and interested in why a number of schemes are not being forwarded at the present time. In terms of offshore wind, some of the economics have moved in a wrong direction, partly because of tax credit policies in the United States putting a lot of resource into the development of offshore wind in the United States. In any case, the prices of some component steel have gone up at the present time, so I am obviously concerned about that, but I do not think that would lead me to the conclusion that we need to look at the whole consents issue and queuing.

Q931 Mr David Jones: I am wondering whether you ought to allow the current stock of consents or granted consents to be used up before you grant any more consents for other projects?

Malcolm Wicks: I will think that through, but I think not probably because, given some do not proceed to fruition, you probably need other people coming along behind them.
Q932 Mr David Jones: There is an extant consent there that has not been exploited?
Malcolm Wicks: I will think through what you are saying. We need to give consent to some things, Chairman, and I look forward to your Committee’s recommendation on what you do support as well as the individual concerns of constituencies about what you are going to oppose.

Q933 Chairman: I hope you do not think we are being negative.

Malcolm Wicks: Not at all, after two hours I was not implying that.

Q934 Chairman: We are almost at an end. Could I thank you very much, Minister, and your officials and Mr Williams from the Wales Office for the comprehensive way in which you have answered our questions and, I should add, with patience and good humour. I suppose, as you said, with the combination of heat and power! Malcolm Wicks: I hope the loud voice was appropriate, Chairman. Thank you very much indeed.

Supplementary Memorandrum submitted by Malcolm Wicks MP, Minister for Energy, DTI

Annex

DURING THE EVIDENCE SESSION ON 13 JUNE, THE MINISTER UNDERTOOK TO PROVIDE INFORMATION ON THE FOLLOWING AREAS

1. THE FUNDING OR SUPPORT THAT GIVEN BY THE DTI FOR THE CENTRE FOR ALTERNATIVE TECHNOLOGY IN MACHYNLETH (Q839); AND A DETAILED (GEOGRAPHIC) BREAKDOWN OF DTI RESEARCH AND DEVELOPMENT FUNDING FOR RENEWABLE ENERGY IN WALES (Q837)

The DTI does not keep figures on particular spend on renewable energy research and development in Wales. As was mentioned to the Welsh Affairs Committee the DTI tend to award research grants within particular programmes on the basis of fit against a range of criteria rather than geographical location. The data the DTI keeps on programmes would usually be based on the registered office of the lead applicant rather than where in the UK the research was actually being carried out. The lead applicant would then distribute the grant to collaborators as milestones within the project are met.

In sourcing data in relation to the Welsh Affairs Committee’s request the DTI has noted a number of organisations in Wales, which are participating in specific R&D projects supported by the DTI and the Research Councils. For example in the renewables area there are a number of Supergen consortia that include Welsh academic institutions:

— UK Sustainable Hydrogen Energy Consortium includes University of Glamorgan;
— Photovoltaic Materials includes University of Wales, Bangor; and
— Bioenergy includes Institute of Grassland and Environmental Research.

There has also been funding to Cardiff University on fuel cells from EPSRC.

There have also been a number of specific R&D proposals funded by DTI in the photovoltaics area in Wales, particularly:

PV Field Trials
- Machynlleth Domestic PV Field Trial Project
- Optic Project—LSBIPV
- St Mellons—DFT2
- Steelstown Housing—DFT2

Solar-photovoltaic elements of the Technology Programme
- Capacity Ten Seven (ICP Solar)
- Electra-Clad (ICP Solar)

2. THE FREQUENCY OF MEETINGS OF THE TRIPARTITE GROUP ON ENERGY CONSENTS, AND THE TIMETABLE FOR IT TO REPORT ITS FINDINGS TO MINISTERS (Q854)

The tripartite group has met six times since it was formed in August 2003. There is no specific timetable for the group to report its findings to Ministers, but it will aim to complete its work as soon as possible following the publication and full consideration of the outcomes of the Energy Review.
3. A Breakdown of the Costs of British Coal and a Comparison with Overseas Markets (Q876)

UK-produced coal currently costs coal-fired electricity generators less than imported coal does.

Import V. UK Deep Mine Output Prices 1995-2007 (£/Gigajoule)

(‘ARA’ = ‘Amsterdam/Rotterdam/Antwerp’, i.e. imported coal, here at UK delivered prices)

(“ARA” = “Amsterdam/Rotterdam/Antwerp”, i.e. imported coal, here at UK delivered prices)

The table above (taken from a paper by UK Coal plc) shows that until 1999, UK-produced coal commanded a premium over imports. The market was unsettled in 2000–03 (UK Coal Operating Aid was available 2000–02 to support UK producers through this). Since 2003, import prices have exceeded those for UK-produced coal. They peaked sharply in 2004 owing partly to higher coal prices and partly to higher freight costs. They have since fallen back, but current forward ARA prices suggest that they are likely to remain relatively high by historic standards for the coming years.

The table below (also based on UKC information) compares average prices and delivered costs for UK deep mined and opencast coal with those for imports delivered to UK power stations:

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK Output (£/GJ)</td>
<td>1.06</td>
<td>1.10</td>
<td>1.25</td>
<td>1.34</td>
<td>1.50</td>
</tr>
<tr>
<td>UK Delivered (£/GJ)</td>
<td>1.16</td>
<td>1.20</td>
<td>1.34</td>
<td>1.44</td>
<td>1.59</td>
</tr>
<tr>
<td>ARA equivalent ($/tonne)</td>
<td>43.6</td>
<td>72.18</td>
<td>60.63</td>
<td>63.50</td>
<td>68.80</td>
</tr>
<tr>
<td>Import Delivered (£/GJ)</td>
<td>1.32</td>
<td>1.83</td>
<td>1.60</td>
<td>1.68</td>
<td>1.78</td>
</tr>
<tr>
<td>Average delivered import price paid by Drax (based on data in its 2005 Annual Report)</td>
<td>1.85</td>
<td></td>
<td></td>
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</tbody>
</table>

The delivered import price will reflect the UK port of entry and consequent port-to-plant delivery costs as well as the underlying ARA price, which will itself vary according to the amount of coal on the market and the level of demand for it.

The problems facing UK coal producers include:

(a) Current contracts at prices which do not enable them to meet all the present costs of maintaining access to reserves for future production, nor to fund major new investments from retained earnings. We understand that some forward contracts (e.g. for 2007–09) include a link to international market prices (subject to caps and floors) which will in effect give a delivered price for UK produced coal which is slightly lower than the delivered import price, but these contracts are not yet active. Producers argue that UK output should still command a premium to recognise the benefits of the more flexible supply chain they offer, which helps generators to minimise their on-site coal handling costs, and of maintaining access to close-to-market supplies, which may be less vulnerable than imports to world market volatility and speculation, as well as to currency movements.

(b) Lack of certainty about future output, owing to risk of further closures in the deep mine sector and to lack of planning permission for replacement sites in the surface mine sector. The generators cite past unreliability of supply owing to such events as a significant issue for them when negotiating contracts with UK producers.
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(c) Lack of longer term contracts to underpin longer term investment projects. A three year contract, even if on a rolling basis, does not represent sufficient collateral to secure commercial funding for a project which could take eight to 10 years to reach full production.

(d) Their customers' confidence that they will always be able to secure supplies on world markets, albeit at potentially volatile prices, especially when bought “spot” or when (as in 2004) the market is subject to exceptional pressures. It should be noted that in the first quarter of 2006 total UK coal imports were 11.36 Million tonnes (up 10.2% on the same period in 2005). Steam coal imports were 9.69 Mt (up 10.8%), of which 54.2% (5.25 Mt) were from Russia and 30.5% (2.95 Mt) from South Africa. In the same quarter, total UK production was as follows:

<table>
<thead>
<tr>
<th></th>
<th>England</th>
<th>Scotland</th>
<th>Wales</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Mine</td>
<td>2,931,912</td>
<td>0</td>
<td>140,945</td>
<td>3,072,857</td>
</tr>
<tr>
<td>Opencast</td>
<td>250,346</td>
<td>1,818,072</td>
<td>306,542</td>
<td>2,374,960</td>
</tr>
<tr>
<td>Total</td>
<td>3,182,258</td>
<td>1,818,072</td>
<td>447,487</td>
<td>5,447,817</td>
</tr>
</tbody>
</table>

In comparison, UK output in Q1/2002 was 4.9 Mt deep mined (Wales 0.16 Mt), 3.4 Mt opencast (Wales 0.3 Mt), making 8.3 Mt in total, while steam coal imports were 5.0 Mt, including 44.5% S African, 28.6% Colombian and 9.7% Russian.

4. The tidal lagoon scheme at Swansea, the DTI’s assessment of the financial viability of that scheme, and the proposal for a tidal lagoon scheme in North Wales (Q901–903)

I have since giving evidence before the Committee met with two members of the Committee, Sian James and Nia Griffith to discuss the matter of a proposed tidal lagoon project in Swansea Bay. I hope that these discussions were helpful and the DTI’s position is now clear. However, for the record and to avoid some of the confusion that seems to exist around the subject of tidal lagoons, I would like to make some clarifications.

I think it is widely accepted that tidal lagoons are technically feasible being the application of available and well understood technology. This form of low-head hydro is classed as a renewable and so is eligible for support through the Renewables Obligation.

The Committee will appreciate that Government does not endorse individual projects to investors but provides support to all renewables through the Renewables Obligation, with individual technology choices left to the market. Where the DTI does consider individual projects is under the planning process as would be the case for the Swansea Bay project.

All such electricity generating projects are assessed on a case-by-case basis under due process and as such it would not be appropriate for me to pre-empt the outcome of any application for consent. I can confirm that the DTI has had discussions with Tidal Electric Ltd, the company promoting the Swansea project, regarding consents and has provided guidance on making an application and also indicated that an application for consents for the project would be considered. The bringing forward of the project is now a matter for the developer. I am not aware of any similar discussions having taken place regarding a 400MW project off the coast of North Wales.

The Committee also raised the independent assessment that DTI had previously commissioned on the project. We had been asked to publish this report by the Lords Science and Technology Committee and have now done so. The company Tidal Electric Ltd has also issued a rebuttal of the report, copies of both documents are enclosed. I hope the Committee find this additional information helpful.

5. The regulations regarding the use of tallow as a fuel source at power stations (Q891)

The Waste Incineration Directive does not ban the use of tallow as a fuel. Installations may burn tallow provided they comply with regulatory requirements. If, as is usually the case, the tallow is waste within the definition given in the EU Waste Framework Directive, the regulatory requirements allow for a permit to be issued under the Pollution Prevention and Control Regulations 2000 incorporating the requirements of the EU Waste Incineration Directive.

6. DTI involvement and support for biomass research in Wales (Q896)

While the research and findings of the recent Biomass Task Force related only to England, DTI will be working with all stakeholders in Government, industry and the Devolved Administrations in formulating a UK-wide strategy for biomass, which will address the issue of support for research. This strategy is intended to be launched in January 2007.
7. **Information in Relation to Wind Power that the DTI Makes Available to the Public on:**

   (a) *The distinction between base load provision of energy and other provision of energy; and*

   (b) *The difference between capacity and output (Q924).*

   Information on wind power, including the provision of energy, capacity and output, is published in the Digest of UK Energy Statistics (DUKES). A copy of DUKES 2006 will be published on 27 July 2006 and will be made available from the Libraries of the House and the DTI’s own website.

8. **The Information Provided about Wales in the Climate Change Review (Q849)**

   Regional policies are published in the UK Climate Change Programme (UKCCP) 2006, section 4, chapter 3. A copy of the UKCCP 2006 has been made available to the Libraries of the House and is also available on Defra’s own website at [http://www.defra.gov.uk/environment/climatechange/ukccp/pdf/ukccp06-all.pdf](http://www.defra.gov.uk/environment/climatechange/ukccp/pdf/ukccp06-all.pdf)

   *26 June 2006*
Written Evidence

Written Evidence from David Evans

ENQUIRY IN WALES

1. Congratulation on your appointment as Chairman of the Welsh Affairs Committee.

2. I have, over the last two years, been following the proposal for a tidal lagoon to generate electricity, in Swansea Bay. I have no commercial or financial relationship with either Tidal Electric Ltd. or the Environmental Trust. That could change some time in the future.

3. I did ask the Environmental Trust, some months ago, to see if they could arrange a briefing for Welsh MPs, on the project. I understand that you did in fact receive such a briefing.

4. More recently Lord and Lady Anderson have asked me to keep them informed and Alan Williams MP has been very helpful. He has in particular obtained information from the National Audit Office, copies of which I have enclosed.

5. A full written submission is currently being prepared for your Committee. If will, in large part, be based on the study carried out by Consultants W.S. Atkins, the largest multi disciplined Consultancy in Europe. They were supported by a number of other major Consultants, a list is enclosed.

6. I shall not argue the case here, however I would say that the conclusions of the study were that the lagoon system was technically feasible and economically viable. No major obstacles to building the lagoon were foreseen and there would appear to be no significant environmental impact. Prior to building, a full and detailed environmental impact study would be undertaken.

7. However, I have become deeply concerned about the say that the DTI and WDA seem to have handled the matter. They have been extremely hostile to the concept. Their arguments have been based on work that they have claimed to have done, using their own specialist Consultants, who have advised them that tidal lagoons are not viable. They have claimed that the work was carried out in 2002. This cannot be, given that, the Atkins report, the only detailed and definitive work, was not submitted until September 2004.

8. Up until May 2005, the DTI and WDA had refused to reveal the identity of their Consultants. They did however appear at a meeting at the DTI in May of this year. The Consultant representing the WDA is a sole proprietor from North Wales whose speciality is waste water treatment. The DTI used a retired gentleman, who worked on the Severn Barrage project some years ago. Whilst I feel sure that both of these Consultants have great strengths, neither, however, seem to have an technical, commercial or information technology back up. Against this, the team behind the Atkins report have a combined turnover in excess of £3 billion and over 60,000 employees, covering every discipline required, in great depth.

9. The two letter from the NAO would seem to suggest that the claimed work have never in fact been done. Indeed the DTI clearly states in the second letter that they are NOW commissioning a piece of work to assess all the available information. Indeed it was only after Alan Williams asked the NAO for clarification, given the content of their first letter, did the DTI change its position.

10. I also enclose an extract from NATT’s journal, July–August 2004 issue. Again there is a statement by Andrew Davies AM referring to an in depth appraisal being conducted by the WDA. This was made nearly two months before the Atkins study was submitted! I have already mentioned the Consultant that the WDA used to carry out their assessment. As the meeting in May 2005, he was clearly well out of his depth, he was unable to defend his position against the Atkins team. Neither Consultant produced any actual evidence to support their opinions.

11. I find the whole picture very disturbing, particulary given the importance of tidal energy to Wales. We have the second largest tidal range in the World, a source of continuous, predictable and indestructible energy.

12. It is evident that the tidal lagoon proposal for Swansea Bay has not been given a fair hearing to date. Statements made seem to have been made on guess or whim and not on proper analysis.

13. May I wish you and your Committee good fortune in your deliberations, particulary as the timescales placed upon you seem unusually tight.

1 November 2005

Written Evidence from Roger Sheppard

I make the following submission as an individual. I have no connection with any lobby group or formal organisation. I am in contact with many people from across the length and breadth of Wales, within the broader United Kingdom, Europe, and other countries worldwide. I am not employed by a pressure or lobby organisation, I speak totally on my own behalf as one who wishes to defend Wales from needless,
ludicrous and unnecessary industrial development. Development in our rural archaeological and historically rich upland and wild areas are now showing recovery from the near devastating exploitation of past administrations and pursuits of profit driven by lust and market forces.

I fully agree and endorse the need for meaningful and substantial alternative energy generation in order to ensure that the vulnerability to climatic change is minimised for future generations. I also subscribe to significant energy-saving and energy-efficiency strategies provided that the benefits do not outweigh or do not involve impacts, which would impinge on the local populace having the pleasure of use and being enabled to enjoy the richness of their local environment.

Tourism is steadily growing into a major contributor to the economy and well-being of Wales. These new energy initiatives must not diminish the ability of expanding the many tourism opportunities presented with the prospect of the creation of meaningful employment for our young people. We must always be fully aware that tourism adds an average of some £6 million daily to the economy of Wales. An annual income approaching £2.2 billion is not to be ignored by our political representatives.

The daily demand on the National Grid for electrical power by business and household consumers in Wales is approximately 1,700 MW. This requirement rises to around 2,000 MW at winter peak. There are many signs that whilst commercial consumption is stabilising and in some areas reducing, the demand for energy in the domestic sector show a substantial increase in consumer requirement. Although a massive overhaul of energy policy by Government and the supply chain must be undertaken. Yet current figures show Wales to be a net exporter of conventional and nuclear generated electricity.

The United Kingdom, although understood to have significant oil and natural gas reserves is also a major energy consumer in the European family. The UK is the largest producer of petroleum and natural gas in the European community. Nevertheless, after a long period of being a net exporter of both fuels, experts predict that the UK will become a net importer of these vital fuels by the end of the decade. Fresh reserves have not kept pace with the development of existing fields. The reliance on fossil-fuelled generation has historically been paramount in the United Kingdom. We in Wales, historically and with our world standing in the production of raw material along with a successful manufacturing sector, relied heavily in the past, upon our considerable coal stocks paying little regard to the Research and Development (R & D) of enhancement technology. The obvious reason being there was no identifiable profit in R & D.

The remaining stocks of fossil fuel are admittedly diminishing, yet Welsh coal reserves remain at a credible 250 million tonnes. Some in Cardiff Bay would have it that these are insufficient reserves and not worth exploiting. The statement addressed to me as fact and proved after investigation disingenuous. A rather large insufficiency to be ignored I would submit. I find it hard to believe that Cleaner Coal Technology (CCT) would be discarded in order that other less efficient and speculator driven technologies be contemplated whatever the reward to the opportunist.

Clean Coal Technologies (CCTs) make possible the use of coal in an environmentally acceptable and economically feasible manner. They meet numerous regulations with regard to emissions, effluents, and residues. In some situations, CCTs can present the likelihood of satisfying even more stricter parameters and at an acceptable cost.

Wales is crying out for meaningful, well-paid employment, providing security to young families and above all the dignity of independence from the social security benefit system. The revitalisation of the coalfield will achieve this. Imagine the effect that 10 new technology deep pits would have on the stimulus of Welsh energy production, manufacturing potential and the expansion of employment.

I accept the seriousness and urgency of need to address the issue of climatic transition but in a manner that will not overburden localities. Especially those assessed as being traditional areas of high volume mineral recovery and manufacturing. Everyone has a part to play in producing the requisite amount of new and technologically sound energy sources. My home at Coed Hirwaun is but 2.5 kms from the mean high water mark of the Bristol Channel. This coastline is witness to the world’s second highest tidal rise and fall. Many hundreds of billion tonnes of energy filled seawater flow from the Atlantic Ocean and into the Bristol Channel twice in any 24-hour period. Generation from this source is of sufficient strength and reliability to not only light but also give power to many homes and businesses around the periphery and into the hinterland either side of the Bristol Channel. This natural form of energy will cause minimal disturbance to the environment and ecology, additionally causing little or no long-term, needless distress to communities.

Unlike some other technologies such as wind and to a lesser extent wave, both being weather dependent, tides are based on the gravitational pull of the moon and the sun on the Earth’s oceans. Tidal patterns can be predicted far into the future ensuring security of supply of reliable power production.

As water is 800 times denser than air, a tidal turbine is significantly smaller than an equivalent wind device attempting to generate the same amount of power. The tidal solution involves deploying turbines in a sub sea environment with nothing visible above the surface thus the environmental impact is minimal and there is no interference with surface shipping. The blades of the tidal turbine are slow moving (rotating at approximately 15 rpm) with minimal effect on marine life. Studies also show that the turbine sites could act as a “harbour” for marine life in a similar way that wrecks on the seabed support a unique marine environment.
A particular system being developed known as the Rotech Tidal Turbine (RTT) has significant advantages over other tidal stream schemes. In the development of this technology, the developer is focussed on ultimately generating electricity for the commercial market at a commercially realistic target price, in the region of 2.5p to 3.5p per kWh.

Tidal stream energy is a particularly attractive form of renewable energy because it is predictable; the technology to be used is invisible from above the ocean’s surface; it is environmentally benign; it is built on existing technology systems and procedures of other commercial sectors, including the oil and gas industry (fabrication and installation). The technology of tidal power is UK led and British driven. Reliance will not be on redundant and cast off technologies from mainland Europe.

Port Talbot is the home of the worlds’ most technologically advanced 525 MW power plant. The system provides the highest efficiency electricity production along with the lowest levels of emissions from a combined cycle gas turbine (CCGT) power plant anywhere in the world on the Energy Park site at Baglan Bay, Port Talbot. The most significant factor is the ability to attract significant new investment to this region of South West Wales and the creation of thousands of new jobs in the long-term on the largest single area of industrial development land in the UK. The system provides high efficiency electricity production with low levels of emissions. The efficiency of the turbines is said to be close to 60%, giving 30% savings on fuel bills. The possible savings in energy are highlighted by the UK’s requirement of a climate change levy designed to discourage excessive energy consumption. The power plant has one gas turbine, one steam turbine and one electrical generator with an installed capacity of 480MW. The plant shows a combined heat and power (CHP) resource, a heat recovery steam generator (HRSG), steam supply systems with supplementary heat recovery, “black start” (ie starting with no electrical input) capability and connected ancillaries such as cooling towers, a water treatment plant and supplementary steam supplies.

The site also includes an aero-derivative power generation system that also has a black starting capability. This is effectively a small, extra power plant.

The Baglan Bay project was welcomed by the local authority and populace for the potential for regeneration and employment it brought to the locality. Hundreds of temporary jobs were witnessed during construction phase and a substantial number of permanent jobs resulted.

In its current form, PV was developed in the 50s for the space programme. Photo-Voltaic Solar was prohibitively expensive for commercial applications at the time.

However, during the 60s and 70s the potential for use of solar energy for remote off-grid applications was recognised. Increased production and improved manufacturing processes resulted in lower costs and greater demand.

Although Photo-Voltaic Cells can be manufactured from a wide variety of materials Hybrid PV combines Mono-Crystalline and “Thin Film” technologies that produce one of the most efficient silicon cells available. Yet the recovery on initial expenditure has yet to prove to be commercially beneficial for the household consumer in northern Europe. The systems are normally custom designed to fit individual needs. An former service colleague who, living on the south coast of England applied to his local Liberal Democratic-led council for planning permission to erect two PV Solar Panels in order that he could heat his household water by these means. The application was refused because the panels would not be within keeping of the ambience of that particular seaside resort!

Energy from water can be obtained in several ways. The most successful of the possible techniques involves using the kinetic energy obtained by water in falling large distances to drive turbines and generators to produce electricity. Hydroelectric power plants convert the kinetic energy contained in falling water into electrical energy. The energy in falling water is ultimately derived from the sun, and is therefore constantly being renewed. Energy contained in sunlight evaporates water from the oceans and deposits it on land in the form of rain. Differences in land elevation result in rainfall runoff, and allow some of the original solar energy to be captured as hydroelectric power.

Hydropower is currently the world’s largest renewable source of electricity, accounting for 6% of worldwide energy supply or about 15% of the world’s electricity. The amount of energy that can be generated in this way depends upon the volume of water falling and the distance through which it falls. For this reason, most hydroelectric stations are situated in mountainous regions. At present in Wales some 1,700 MW of electricity are generated by hydroelectric power.

The greatest restriction to extension of hydroelectric power is the lack of suitable sites. Not only is it necessary to find a site where water falls as far a distance as is possible from the power station but also to find a site where, if possible, rainfall maintains sufficient water in the reservoir to replace that which generates the electricity.

I feel sure that every member of the committee is aware of the Ffestiniog Power Station, the UK’s first pumped storage hydroelectric power station and situated on the shores of Tan-y-Grisiau reservoir. I submit a masterpiece of engineering and recycling technology that has been in commission for almost half a century. Another example of hydroelectric generation found in Wales is the so-called “Electric Mountain” or Eliden Mountain and 20 year old Dinorwig power station near Llanberis, close to the shores of Llyn Padarn subtly blending with the magnificent backdrop of towering mountains and breathtaking scenery. The pump storage system of producing electricity at Dinorwig relies on falling water turning turbines. To put it simply,
high-pressure water enters the system from a high source at Marchyn Mawr, turns the turbines and exits under low pressure into a retaining reservoir at Llyn Peris. The whole generating complex is deep within Eldin Mountain in a cathedral like cavern of massive proportions. More than 10 miles of tunnels were constructed within the nucleus of the mountain and transit tunnels constructed to Marchyn Mawr and Llyn Peris. In order to contain the amount of water needed to operate the turbines both lakes needed to be enlarged. During full operation the water level will fall and rise 55 feet daily. Llyn Peris was enlarged through removing large quantities of slate quarry waste from the lake rather than by constructing dams at both ends of the lake. The stream, Nant Peris, entering the lake was diverted around it to enter the lower Llyn Padarn. When the valves are opened and water falls from Marchyn Mawr there is an enormous surge in pressure. To counteract this, another shaft was built to a surge pond high upon the mountain.

Dinorwig can produce electricity (1,320 megawatts of power) in 12 seconds, should a sudden surge in demand occur, unable to be met by power stations already connected to the grid. Most conventional power stations take 12 hours to start up from cold and 45 minutes to switch to the grid if they are on “hot standby” or “spinning reserve”. If necessary, Dinorwig can generate a continuous 1,680 megawatts for five hours.

When operating, the volume of water passing through the tunnels at Dinorwig would supply the requirements of London for a whole day. When the extra power is not needed the turbines have a reverse capability and water is then pumped back to Marchyn Mawr where, when the need arises it can be re-used. We, the public have difficulty in recycling our plastic containers.

Which brings me to not only the most contentious and divisive means of renewable energy generation but also the most inefficient, that of on-shore wind power.

For some peculiar reason best known to themselves many politicians and wind factory developers refuse to differentiate between Installed Capacity and Yield. The Welsh Assembly Governments TAN 8 asks for 800 MW Installed Capacity which, at a minimal load factor of 30% as claimed in the small print by the British Wind Energy Association (BWEA), would yield 240 MW maximum. The best production figures I can access are those issued by a department of government which show an average of less than 25% yield. Unfortunately because of the intermittency of wind it will come in random dribs and drabs. A considerable amount of the energy generated will be at night when it is not really needed so this 75% inefficiency rating will be seen to grow in magnitude.

Another fallacy generated by the wind developer and his support is “If we don’t have wind we will have nuclear” this drivel has been uttered repeatedly in newspapers, radio and television interviews and at countless public meetings. Solely for economic reasons, the Installed Capacity of a new build nuclear power station would probably be about 2,000 MW. Because of technical constraints, nuclear is usually ‘base load’ generation and is rarely shut down except for predictable maintenance. It yields about 90% of Installed Capacity. Thus the new build nuclear power station would generate around 1,800 MW. Therefore in order to displace a modern nuclear station there would be a need for 1,800 x 240 or 7 3/4 times the TAN8 megawattage of 6,000 MW Installed Capacity of wind-power ie 3,000 2.0 MW turbines. Reality and a passing interest in basic mathematics will show a far greater number of 400 /500 ft wind towers would be required to achieve the outage required. When there is no wind there would be no electricity, so the conventional power stations would have to operate on “spinning reserve” still producing CO₂ and other emissions in order to kick in when the wind drops. However, the wind not being predictable there will be a lapse before the conventional power station runs up to full operating capacity. At the very least there will be a generation shortfall resulting in, if not blackouts “brown-outs”. Recollect the E.On statement with regard to the requirement of at least 80% of “shadow power” to balance wind vagary, even when it is only around 20% of total generation and you can see just how ludicrous a proposition this is. Either these people have green pea-brains—or they are part of a wicked conspiracy to destroy our power industry and economy.

Wind power stations will never be “green”, the reality is that the unreliability and unpredictability of wind makes it totally incompatible with the very real needs of a modern society that insists receiving instant energy at the flick of a switch. Are we in Wales really being asked to accept that 10% of our power requirements are completely subject to whether northern Scandinavia is under a high or low-pressure weather system? In order to safeguard the security of supply whether on or off shore, conventional fossil-fuelled stations have to be running on line, expending resources and emitting the deadly CO₂ gases which then helps enhance climatic contusion. Our Danish and Irish colleagues should be held continually in mind by misadvised ministers and misguided officials of the catastrophic effects of reliance on wind-generated energy. They, [the Danes] were forced to and continue to buy nuclear generated energy from Sweden, who themselves gave up on wind energy many years ago.

I acknowledge that topography and climate make Wales and indeed the Celtic Fringe suitable for the development of a multifarious selection of renewable energy projects. Coincidentally, these qualities are precisely those that make our country so attractive to a wide and diverse type of tourist, the horseperson, walker, mountain-biker the family cyclists and the just plain nature lovers all of whom we would wish to welcome to the unspoiled uplands. However, I feel that our historical, religious and archaeological heritage would be forever desecrated by this manifestation of wind power stations. Is it truly inevitable that the unique beauty of Margam Country Park amongst many other genuine treasures would be irrevocably compromised and visitor numbers drastically reduced by the industrialisation of the hillsides with power stations and their attendant ancillaries, many hundreds of miles of transmission lines? The erection of scores
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of additional pylons, the requirement for large-scale excavation, transportation of plant equipment and materials to sites. The intrusion by development into the many footpaths and tracks crossing the wild and undeveloped areas of the locality.

It has recently become customary for people of the Anglican persuasion to join with other religious orders to participate in pilgrimages. The highlands of south and mid Wales are the routes of two holy pilgrimage routes stretching from the east to the Cathedral city of St David’s in the far south west, what provision will be made for the preservation of this and other examples of our ancient heritage or is it all to count for nothing? Is it beyond the comprehension of those who choose to call themselves our elected representatives that far from attracting tourists, wind factories in fact deter the visitor, hence the closure of so called wind-power visitor centres in East Anglia, Cornwall and other locations within the UK and Europe? To give a personal analogy, as a child of pre-teenage years I spent hours on Port Talbot and other railway stations waiting, sometimes in the cold and wet, for steam driven trains to come thundering by. Suddenly I reached puberty and the rest, as they say, is history.

Environmental groups until recently used a Wales Tourism Board (WTB) survey in which they claimed that 86% (they like that figure) of those polled would return to Wales to view the “pretty” wind turbines. Unfortunately for them, being of an inquisitive nature I checked the facts with WTB. There was no mention anywhere in that particular survey of wind appliances, not even a tuba. The same organisations and wind developers on other occasions have used the same tactic with Scottish figures to support their backing of wind power generally, again to have their figures discredited. The claim being yet again 86% of people did not feel their visit disrupted by wind farms. These 18 people were 43 miles from the nearest wind turbine. Unfortunately many of these organisations do not accept the offer of good quality and substantiated technical evidence in their pursuits, so as a consequence they attempt to influence but not inform on the veracity of their particular cause. If your product is as good as you intimate surely you do not have to devalue the facts in the presentation.

At Annexe “A” I present photographic evidence of the destruction around the infamous Cefn Croes blunder. It has also come to light that within the planning permission agreement, there is no responsibility on the developer to fully restore this site to its past glory. The planning arrangements agreed by the Ceridigion County Council require only that the turbines are removed off site on completion. So the 39 Olympic swimming pool sized concrete bases remain, the roads remain and masses of underground cabling and construction debris will remain. So much for the “only true green means of renewable energy”. I would remind those concerned with the decision making process of this inquiry, that the conclusion that this defilement was to go ahead was made by a Minister of Energy in whose constituency exists a nuclear power station, employing and supporting many voters within his and neighbouring constituencies. We are given to believe that wind power is nature’s answer to nuclear generation. Am I to assume that the minister concerned was the only turkey on the farm to vote for Christmas?!

I would like to finish this submission with some extracts from the March 2004 edition of “Planning Policy Wales” which sets out the objectives of the Welsh Assembly Government:

Chapter 11

— Tourism is a major element in the Welsh economy . . . tourism can be a catalyst for environmental protection, regeneration and improvement in both rural and urban areas.

The Assembly Government’s objectives for tourism are:

— To encourage sustainable tourism in Wales, maximising its economic and employment benefits, . . . encouraging its development in non-traditional destinations, while safeguarding the environment and the interests of local communities.

— to manage change in the tourism sector in ways which respect the integrity of the natural, built and cultural environment to provide for economic growth, employment and environmental conservation.

(Annexes not printed)

9 November 2005

Written Evidence from Denise Idris Jones AM, Conwy Constituency

I represent the Constituency of Conwy.

The area in and around Llandudno is a high-density tourism location. Over one-fifth of all the tourism spend in North Wales is spent in this location.

The Gwynt y Mor scheme, sponsored by npower, envisages the erection of approximately 240 wind turbines in the sea off Llandudno. They are located, at the nearest point, eight miles off-shore.

These turbines will be 541 feet tall from sea level to the tip of the blade at its highest point. In normal atmospheric conditions, they will be visible from shore across the horizon.
Local environmental groups have held meetings in protest at the erection of these turbines. They assert that the present uninterrupted sea view will be spoiled and that tourism will be affected. Many owners of hotels and guest-houses have added their voices of protest and concern.

Whilst supporting the Government’s plans for power from sustainable sources, I would urge that large-scale plans such as the Gwynt y Mor scheme, which impinge on the beauty of our land and seascape, should be looked at again and replaced with schemes which do not impinge so drastically on our natural environment.

September 2005

Written Evidence from Cllr Stuart Anderson, Conwy County Borough Council

I can send an outline map diagram of the proposed North Wales integrated harbour/marina/offshore impoundment scheme, which is being discussed next Wednesday between RWE Innogy/npower and a small cross-County group including Conwy’s and Denbighshire’s Cabinet members for Environment.

Up here, after nearly six long and patient years pursuing the idea, we have developed a somewhat different “angle” on the OTI concept than the one promulgated by Peter Ullman of Tidal Electric, which we think you should be briefed about.

Unlike TE we doubt it will ever be as “economic” as offshore wind power. It will also be more restricted—for reasons explained in materials I can send. In the first instance it needs a pilot scheme, at a site where it is actually wanted for other reasons (harbour, marina, iconic visitor centre). I was present in June 2001 at a meeting with the North Wales Regional Director and Energy Officer of WDA, when Peter Ullman was offered help with a pilot study, which he turned down on grounds that he felt the scheme was already ripe for commercial launch. Quite ridiculous! There was also over-sensitivity about patent and intellectual property rights. This was also the reason he upset RWE/npower (then National Wind Power) in separate talks, to the point where they broke off communication. He is a pleasant enough chap personally, but underneath it all very possessive and “pushy” in terms of business attitude, and despite the sales talk gets upset and touchy when mere “locals” such as myself want a hand in discussing things to do with layout etc. He has also been maddening for the WDA to deal with—though the problem admittedly is a shared one in that respect.

In short, it’s taken a long time to get to where we are, and though we are grateful to Peter Ullman for his idea, we have modified it ourselves now to such an extent that we feel it is a distinct entity. We are working in close contact with Keith Williams and Professors Jim Poole and Roger Falconer from UOW Cardiff to take things further.

We would be happy to include Peter Ullman in a study—but strictly on our terms, and the WDA’s original ones, which were that information and results should be freely available to all parties.

One of the big and necessary adjustments we think we’ve hit on is the need for large turbine (and sluice) capacity—perhaps three or four times as much turbine capacity as Peter (or ourselves originally) thought necessary.

There seems simply to be no way round this snag, which also (incidentally) has equally big implications for a tidal barrage. The plus side (particularly relevant in relation to the barrage scenario) is that if you can uprate capacity, flows approximate to the natural ones but are just delayed by four to five hours. On the whole silting-up, and interference with wildlife eg wading birds’ habitat, should be a lot less. Also Jim Poole is in contact with a New Zealand firm that has experience with geotextile bag usage in exposed artificial reefs—they seem to be reliable and are also advising Bournemouth County Council over flood defence.

The findings from a pilot OTI would be important for future tidal barrage schemes, too. Since the demise of the Severn Barrage studies, there has been a bit of a conspiracy of silence on this subject, it being assumed that we know all there is to know already. We are sceptical about this! Two decades is a long time and engineering advances have been considerable since, especially in the realm of offshore use of materials, and in the necessary business of joined-up thinking in relation to flood defence.

There’s no doubt marine current turbine (MCT) technology is forging ahead—an excellent thing . . . But this has no side-benefit potential to flood defence, and we in Wales are supposed to be committed to the principles of sustainable development, which take social as well as environmental and economic factors into account—not to say, post-New Orleans—future resilience. Sixty per cent of people live along the coast in Wales, and they want to know that the government cares about the effects of future rising sea levels. If we can do things that protect us and reduce carbon dioxide emissions, surely we should be looking actively into doing so. Curiously, Rhyl may not be a bad place to start.

11 November 2005
Written Evidence from Alun John Richards

I am a life-long environmental campaigner deeply concerned about climate change. The evidence that this is caused, at least in part, by pollution from the burning of fossil fuel is as yet unproven, but whilst even a possibility exists that this may be the case, it must be urgently addressed.

The government clearly has no cogent energy policy and appears to have turned its back on the most obvious way to reduce emissions—use less energy. It has also singled out just one pollution source—electricity generation, and to this end has concentrated on probably the least effective, least reliable and amongst the most expensive, means of generation—wind.

Quite apart from the technical evidence as to the ineffectiveness of wind as a large-scale power source, the fact that developers massage statistics—cite installed capacity rather than actual output, confuse average demand with maximum demand, talk emotively about homes despite domestic consumption being just a fraction of total needs and spurious employment predictions—suggests that their case is defective. Unfortunately present fiscal arrangements mean that wind generation is more profitable than any other industrial activity, providing developers with great financial leverage.

Climate change is too serious a matter to have resources dissipated on such ineffectual measures while tidal and other means offer the probability of more effective and indeed cost-effective, ways of pollution attenuation. In the meantime nuclear and clean-coal technology offer fully developed technologies for so doing on a scale that wind never can.

In the meantime TAN 8 places such pressure on Local Authorities to ignore local wishes and people’s lives, livelihoods and property values, not to speak of the 50MW referral, as to call into question the legitimacy of the present regulatory framework.

In the interest of protecting the landscape, the public purse and the well-being of individuals, I commend a moratorium on further wind power development in Wales.

25 November 2005

Written Evidence from Dave Bradney

1. Structure of evidence: As requested I have numbered the paragraphs of this evidence (1 to 27). Where I have asked a specific question or made a specific request for action I have marked it thus: "***.........***" So it should be easy to locate all these requests by searching for "***" within the electronic version of this text. Should you require this evidence to be validated with a covering letter or complete hard copy, please contact me urgently. If validation is about checking that I am who I say I am, I am in the Ceredigion Electoral Register at the above address and listed in the Aberystwyth 2005–06 Phone Book.

2. Source of evidence: I have a first degree in biochemistry and a postgraduate diploma in journalism studies. I have worked most of my life as a journalist, on general and specialist publications. Since 1986 I have been an activist in the Green Party, standing in elections for the London Borough of Brent, the National Assembly for Wales (1999), the European Parliament (2004) and Westminster (2005). Within the Green Party I have edited the England and Wales Green Party’s newspaper, co-chaired its Regional Council and acted as Treasurer for Wales Green Party. I have lived in Ceredigion, in mid and west Wales, since 1991, and have worked as a journalist in Aberystwyth since 1993.

3. My evidence will be mainly about large-scale onshore wind-energy schemes—about their centrality or lack of centrality to the effective prevention of climate change, and about whether they provide the lowest-cost route for generating large amounts of renewable energy. When I say “cost” here I am talking about environmental damage, although I accept that financial cost is also a criterion that should receive some consideration.

4. I have been concerned about large-scale wind-energy schemes since 1998, when I was preparing to stand in the first National Assembly elections. As you may appreciate it is not easy for anyone in the Green movement to cast doubts on the desirability of renewable energy, but the unconvincing nature of the arguments and information available make rigorous questioning essential. Particularly when the damage that large-scale onshore wind installations inflict on the countryside and visual amenity is so manifest.

5. The core of this work for me was the consideration of the proposals for a large windfarm at Cefn Croes, between Cymystrwth and Devil’s Bridge in Ceredigion. This led to Wales Green Party taking a stand against the scheme, and to Ceredigion Green Party submitting a formal objection to it (see Annex A).

6. Cefn Croes was commissioned early this year, with 39 turbines of around 100m overall height on 750ha of remote upland plateau, dominated by peat bog. At the time it commenced to generate I believe it was the largest working windfarm in Europe, although now of course there are several larger—even much larger—schemes proposed and in preparation. But the exact position of Cefn Croes on the hugeness “league table” is unimportant—what I would suggest to you is that since it is big, modern, up and running and in Wales this is the model to have in mind when you are considering the current round of large-scale wind-energy proposals.

*** I recommend that inquiry members visit the Cefn Croes site, on a day when visibility is good! **
7. Future large-scale windfarm developments which are anticipated in Ceredigion include the Camddwr scheme, which would stretch along the ridge of the Cambrian Mountains between Strata Florida and the Teifi Pools in the north to Llyn Brianne in the south, and one or more contiguous developments in the Nant y Moch area north of Aberystwyth, which has been designated by the National Assembly as a TAN 8 Strategic Search Area (see comments later).

8. Throughout my involvement with these issues, I have been struck by two general observations. Firstly, that there is a group of people who speak and act as though building large onshore windfarms is the key to preventing climate change (which it demonstrably is not, as I will discuss later). And secondly, that this same group of people speak and act as though there has already been a Great Debate about how to tackle Climate Change, in which the countryside has already been specifically chosen to bear the brunt of the damage (clearly there has been no such debate, and therefore the countryside has not been designated in this way).

9. I have also been struck by the paucity and unreliability of the information available on a range of issues which are central to assessing the role which large-scale onshore wind-energy can and should play in an overall package of climate change prevention measures. I attribute this situation largely to the fact that the relevant information is to a considerable extent in the hands of the energy companies and their developers, who tailor the information which they see fit to release to suit the cases which they wish to make.

10. Select Committees of course have considerable powers to require the provision of detailed information, and so providing they know what questions to ask they are a powerful tool for getting at the truth. The establishment of your inquiry comes at a pivotal time in the expansion of the onshore wind industry in Wales, and the information that you gather and promulgate this year could prove crucial in the avoidance of any unnecessary damage to the Welsh countryside.

11. Accordingly, the core of my evidence will consist largely of questions to which as a single individual working more or less alone I have been unable to obtain credible answers. *** My sincere hope is that your inquiry will address the right questions and accept nothing less than rigorous and convincing answers—commissioning independent research whenever there seems to be a significant gap in the information available. ** In this way your inquiry will have done a great service not only to Wales but also to the fight against climate change, which in my opinion we have left so late to begin that we really cannot afford any false starts.

12. To conclude this introduction, here are some general points which I believe it is essential to keep in mind as part of any framework for considering the role of large-scale onshore wind installations in the prevention of climate change, in the international, UK and Wales contexts:

(a) To avoid the worst consequences of climate change, we need to reduce global carbon dioxide (CO₂) emissions by something like three quarters on 1990 levels. Broadly speaking this statement represents mainstream professional opinion within the science of climatology. Of course there are always contrarians.

(b) Renewable energy installations do not magically soak up CO₂—all they do is provide an opportunity to “retire” an equivalent amount of carbon-based generating capacity, while maintaining overall electricity generation at the same level. Therefore, the simple act of bringing a windfarm on-stream does nothing of itself to prevent climate change.

(c) Wales already generates roughly twice as much electricity as it consumes (**please confirm exact figures**). The excess passes across the National Grid—less the substantial transmission losses—for consumption in England. The generation of yet more electricity in Wales would therefore not seem of itself to be an objective that should be allocated a high priority.

(d) Already, onshore in mid-Wales, there is roughly as much installed wind-energy capacity as exists in the whole of England (**please confirm exact figures. **) To anyone who knows the industrial history of Wales within the UK—coal, steel, water—this should ring alarm bells.

(e) There is ten times as much wind energy available offshore as is available onshore (DTI figures, quoted in the Friends of the Earth publication “Wind power: your questions answered”).

13. Here are the main questions for which I would like the inquiry to seek convincing evidence. I have made no attempt to put them in any particular logical sequence.

14. Pay-back period analysis is obviously applicable to wind-energy projects. CO₂ payback is tricky, since any calculations depend on which particular carbon-based generation technology or mix of technologies is deemed to be cancelled out. Energy payback is a more straightforward way to look at this. Figures for the energy payback period of a modern wind turbine with a working life of 20–25 years are often quoted in the region of 6–8 months, but I find this implausible. If I had been told the figure was 3–4 years I would probably never have questioned it, but 6–8 months seems entirely beyond belief. Remember, this payback calculation has to include: the energy cost of extracting and processing all raw materials, manufacture of components, transport of components to site (typically from Germany), site preparation (digging huge holes, creating a network of wide, graded roads around the site and an access connection to the public highway, laying underground cables, office buildings, hydrological work), assembling turbines (huge concrete foundations, high-level work with large cranes), creating a powerline connecting the windfarm to the National Grid (the Grid Connection), site security, maintenance and decommissioning and disposal. All carried out in quite challenging, hilly terrain.
15. As I understand it, the energy output of each turbine is measured at the turbine itself, and it is on these figures that payment for the electricity generated depends. It has been suggested to me that transmission losses across the length of the Grid Connection are considerable, so that the power that is actually delivered onto the Grid is considerably less than the amount that left the individual turbines of the windfarm. If true, this would mean that much less electricity is being delivered to the National Grid than is being paid for.

*** Please would the inquiry establish what proportion of the surplus electricity generated in Wales is actually delivered onto the Grid connection? The energy output of each turbine is measured at the turbine itself, and it is on these figures that payment for the electricity generated depends. It has been suggested to me that transmission losses across the length of the Grid Connection are considerable, so that the power that is actually delivered onto the Grid is considerably less than the amount that left the individual turbines of the windfarm. If true, this would mean that much less electricity is being delivered to the National Grid than is being paid for.

*** Please would the inquiry establish what transmission losses should be expected across a Grid connection, eg the Grid Connection at Cefn Croes, which I believe is quite a long one? **

16. Roughly twice the electricity that Wales needs is currently being generated in Wales (see para 12c). (***please confirm exact figures **). It would seem unavoidable that the surplus is intended for use in England, but because electrical power is a perishable product much of it will have been wasted in transmission losses by the time it has been shipped across the National Grid to England.

*** Please could the inquiry establish what proportion of the surplus electricity generated in Wales is wasted during its transmission for use in England? **

*** Please could the inquiry establish how much electricity could be saved (a) in Wales and (b) UK-wide if electricity was generated close to its main centres of demand—eg if all electrical power was generated within 50 miles of its intended consumers? **

17. We are told that the purpose of renewable electricity generation is to reduce CO2 emissions, but as discussed in para 12b renewable energy installations do not directly absorb CO2, they merely provide an opportunity to make corresponding reductions in carbon-based generation. If it is public policy to pursue this transition, to assist with the prevention of climate change, a coordinated plan for achieving maximum effect through an orderly progression of incremental adjustments might be expected.

*** Please could the inquiry establish whether any plan for a transition from carbon-based electricity generation towards renewable electricity generation exists? If there is no such plan, is there any intention to create one? And if there is such a plan, why is its existence such a well-kept secret? **

18. Although windfarms do not directly absorb CO2, disturbing evidence has recently emerged that windfarm sites can EMIT large quantities of CO2. The expert committee responsible for monitoring environmental changes at the Cefn Croes site has been told that the consequences of partially draining the raised bog into which the turbines have been inserted have been “dire”, and that a “huge amount” of exposed peat around the turbines is gradually drying out and oxidising, leading to the emission of “huge” amounts of CO2 to the atmosphere. The news story which exposed this situation can be found at Annex B.

*** Please would the inquiry interview members of this committee to establish the nature and extent of the problem, and its likely progression? Please would the inquiry be sure to interview Becky Jones, the Environment Agency’s Senior Environment Officer for Ceredigion, who is quoted in the newspaper story? **

*** Please would the inquiry establish, if the present hydrological arrangements at the Cefn Croes site persist, what proportion of the supposed CO2 saving from the operation of the windfarm will be cancelled out by the release of CO2 from the surrounding bog? **

19. Leading on from para 18 there is a wider question—did the CO2 described above arise because the hydrological arrangements at the Cefn Croes site were poorly done, or does the Cefn Croes experience demonstrate that it is impossible implant large-scale wind-energy equipment into raised upland bogs without wrecking those bogs as a precious habitat and releasing “huge” amounts of CO2?

*** Please would the inquiry seek to establish whether it is practically possible to install a large, modern windfarm in a peat bog without creating major damage and CO2 emissions—taking evidence from independent engineers and ecologists as well as industry experts? **

20. Recently there were press reports of an incident in Scotland in which a rotor blade of a large wind turbine shattered, with large fragments being scattered across some distance. There have also been reports that in cold weather large chunks of ice can build up on turbine blades and fly off, landing some distance away. The incident with the broken blade is described at Annex C.

*** Please would the inquiry establish what the safety record of large, modern wind turbines is, as regards a) rotor breakage and b) ice hazards in cold weather? **

*** Please would the committee establish what the minimum safe distances from modern wind turbines should be, for (a) households, (b) pedestrians and (c) ridden horses? **

21. There are repeated reports of individuals who claim to have experienced serious psychosomatic illness in the vicinity of windfarms. This is often attributed to “low-frequency sound”, by the individuals affected or on their behalf. A number of General Practitioners are understood to be carrying out small-scale epidemiological studies, but as far as I know there is little academic research work being carried on this. An account of one such case of illness, in west Wales, can be found at Annex D.

*** Please would the inquiry do what it can to establish whether “low-frequency sound” (or whatever it actually is) from windfarms is a hazard to human health, taking evidence from independent doctors and acoustical engineers as well as from industry experts? **
22. It is often claimed that large-scale onshore wind installations are of major benefit to the local economy, by creating permanent (ie post-construction) employment.

23. The inquiry’s terms of reference include investigation of the division of powers over energy policy between the Westminster Government and the National Assembly for Wales, and it seems to me that this is a vexed question. In the Government’s proposals for a Welsh Assembly ("A Voice for Wales", White Paper, 1997), energy is not mentioned in the list of responsibilities (page 7) which the devolved assembly would take over from the Secretary of State for Wales; and in the fine print (Annex A) the only reference is to the “promotion of energy efficiency”. Immediately before the creation of the National Assembly, “Making the Difference in Wales: A Guide to the powers of the National Assembly for Wales” (Devolution Unit, Welsh Office, February 1999) gave a detailed account of the powers being transferred. A table under the head “Industrial, Economic and Social Development” allocates “energy efficiency” to the Assembly, and “regulation of the privatised . . . electricity . . . industry” to Whitehall. In the Energy Review (Performance and Innovation Unit, Cabinet Office, February 2002), Box 1.1 on page 16 states quite unambiguously that powers to promote renewable energy have not been devolved to Wales, and yet at that time work by the Assembly’s Economic Development Committee on this topic was already ongoing (Review of Energy Policy in Wales: Part 1: Renewable Energy, April 2002), and this work has continued strongly. All this is suggestive of the possibility that the National Assembly actually has no standing in the field of renewable energy (except as regards town and country planning), and has been carrying out considerable programmes of research and policy development work in this policy area on an ultra vires basis.

24. Another aspect of the division of powers between Westminster and the National Assembly arises in the town and country planning system, because of the operation of Section 36 of the Electricity Act 1989, which provides for renewable energy schemes with installed capacity of 50MW and upwards to be decided by the Secretary of State for Trade and Industry rather than through the usual planning process, which would provide for initial decision by the local planning authority, with the possibility of review and modification of that decision by the National Assembly for Wales. The DTI process does offer the possibility of a local planning inquiry, providing a statutory consultee indicates that this would be desirable, but even so it can be argued—and I would do so—that decisions on large windfarm schemes in Wales should be taken within the Welsh planning system. It can also be argued that the failure to transfer Section 36 powers to the National Assembly was no more than a technical oversight, arising during a period of legislative overload. However, this latter suggestion seems to me to be less likely.

25. Next there is the question of the National Assembly’s new planning guidance on renewable energy. Technical Advice Note 8 (TAN 8), and its associated Ministerial Interim Planning Policy Statement. I will try to keep this brief, because I am really not sure whether your inquiry will consider that TAN 8 falls within its remit. TAN 8 has come into being perhaps because of the Assembly’s strong interest—rightly or wrongly—in the development of renewable energy in Wales, but even if the interest was originating from Westminster it would still be the task of the Assembly to reflect it in some way through planning policy guidance. Stated very simply, as I understand it, TAN 8 designates a series of areas in rural Wales—called Strategic Search Areas—as being suitable to accept large-scale wind-energy developments, and seeks to diminish the grounds for objection to such schemes through the operation of the planning process. A TAN 8 draft was the subject of a consultation process last year, during which as I understand it the overwhelming response was adverse, including adverse reaction from a number of local authorities in Wales. Nevertheless the final version of TAN 8, as far as I understand it, was essentially unchanged. The stripping away of the public’s rights to scrutinise and object to proposed developments which are claimed to be in the national interest would appear to be undesirable, and doubtless reflects the Westminster Government’s impatience to “streamline” the way that the planning system handles major infrastructure projects. It is easy to imagine the TAN 8 approach being applied to nuclear power stations, airports and motorways. I have heard it suggested that the use of TAN 8 may be in breach of the UN’s Aarhus Convention, which covers public participation in decision-making and access to justice in environmental matters. The UK became a signatory of the Aarhus Convention early this year.
26. Finally—even though I am rapidly running out of the time I have available in which to compile this evidence—I cannot resist some general comments on future patterns of energy demand and supply in Wales. Currently it would appear that Wales is roughly 100% oversupplied with electricity (para 11c). However, in the future the closure of the Wylfa nuclear power station (approx 1GW) can be anticipated, and carbon-based electricity generation needs to be drastically cut back as part of a general package of climate change prevention measures (para 11a). After the closure of Wylfa, electricity oversupply in Wales might be of the order of one third above demand. Proposed and existing wind-energy schemes already offer substantial amounts of renewable energy, especially the proposed 750MW windfarm Gwynt y Mor, off the coast of north Wales. Tidal current generation would appear to offer considerable opportunities in particular locations around the Welsh coast and in the Irish Sea, eg Bardsey Sound. Tidal current schemes can be visualised as groups of stubby wind turbines, but under water. The crucial differences are: (a) water is roughly 800 times more dense than air, so much more power is available, and (b) the tides are highly predictable, unlike the winds. I am aware of tidal current generation development work off the coast of north Devon, but as far as I know there is no active development or exploration work in Wales. Joint ventures with the Irish Republic should be given active consideration. Tidal lagoon projects also offer generation opportunities, and I believe there are detailed proposals in the Swansea area and on the north Wales coast near Rhyl. Microgeneration seems to have been completely overlooked so far, and micro-hydro and small-scale wind schemes serving individual properties and small groups of properties should receive major encouragement. One major issue is the upgrading of Building Regulations, so as to oblige the building industry to incorporate energy-saving features and micro-generation features into all new dwellings, offices and factories. If it is true (Energy Review, 2002) that control of Building Regulations has not been devolved to the Assembly, this is an issue that this inquiry could focus upon, and on which inquiry members could follow up during their ongoing work as MPs. The most difficult aspect of the problem, I believe, is how to introduce a substantial stream of renewable energy into the transport consumption sector. For this I propose the skipping of any number of intermediate solutions in favour of developing the “hydrogen economy”, so that scattered renewable energy installations can be used to generate hydrogen, for storage on site and collection for individual consumption by hydrogen-powered vehicles. This would amount to a network of renewable energy “filling stations”, and would largely eliminate the need to transport automotive fuels. I realise that there are still engineering issues to resolve with the hydrogen economy, but I also know that several nation states (eg I believe Iceland, Finland and the US) are working on development and planning, so why not the UK and within it Wales?

*** In line with para 17, please would the inquiry investigate the feasibility of developing a plan for the progressive elimination of surplus carbon-based electricity capacity in Wales (leaving in place a sufficient reserve to cover predictable fluctuations in demand, and emergencies, of course), with matching increases in renewable electricity generation in England, and make detailed recommendations? Such a plan would minimise wasteful transmission losses, and at the same time offer rapid reductions in CO2 emissions from the electricity generation sector. **

*** Please would the inquiry explore ways in which the Building Regulations could be used to increase and maximise the incorporation of energy-saving features and micro-generation features into new-build dwellings, offices and factories, and make detailed recommendations? **

*** Please would the inquiry evaluate the potential of the “hydrogen economy” within Wales, taking detailed evidence on the ongoing planning and development work being carried out in other countries, and make detailed recommendations? **

*** In particular, please would the inquiry evaluate the potential of the disseminated generation of hydrogen fuel from renewable energy, as a means of creating a major route for renewable energy into the transport sector, and make recommendations? **

27. This concludes the evidence I have to offer (four annexes lettered A to D follow). Thank you for taking the time to consider this evidence, and I hope it will help you in your deliberations.

25 November 2005

Written Evidence from David H Insall


Scope of the Submission

2. This submission is entirely concerned with Item 3.d., “wind farms”, covering in particular the actual and predicted effects of the harnessing of wind power on the environment of Wales including:

(i) Wildlife—populations and their habitats.

(ii) Rural communities—the collapse of hill farming and social divisions caused by “wind farms”.

(iii) Impact on alternative sources of income for rural communities, especially tourism.

(iv) The corruptive effect of the quasi-subsidies on the entire chain of command, from the higher echelons of Government down to landowner and farmer.
3. It includes case history of the micro-situations witnessed at first hand by the author from 1993 to the present day. Much of the case history focuses on facts surrounding the proposed “wind farm” at Mwdwl Eithin, within the Clocaenog Forest Strategic Search Area in the County Borough of Conwy.

QUALIFICATIONS OF THE AUTHOR

4. The author has sustained a life-long interest in conservation of natural and cultural environments, including many years service as a conservation adviser to the Government of the Sultanate of Oman. He has also worked for over twenty-five years as a hill farmer and conservationist in North Wales. He is currently employed as an international environmental consultant in the private sector.

5. Unlike most of those opposed to large scale development of electricity generation from wind power, I own land judged to have a high wind resource and am therefore a potential benefactor from the current régime. I have chosen to reject a substantial offer of money rather than inflict lasting damage on the natural environment of his land. As a state pensioner with no occupational pension, I have foregone the offer of a predicted payment of £30,000 annually for up to 25 years, rather than allow wind farm developers to inflict severe environmental damage on my land.

CORRUPTIVE EFFECT OF FINANCIAL INCENTIVES—CASE HISTORY TO DATE OF THE PROPOSED MWDWL EITHIN WIND FARM

INVASIVE APPROACHES BY WIND POWER PROPORENTS

6. 1993. The Mwdwl Eithin project was first mooted in 1993 by a boundary neighbour of our farm, Blodnant. Unlike the other boundary neighbours, he was a multi-millionaire businessman who lives 19.5 km from the centre of the proposed development. He had sold a large electrical business and reinvested the money in farms, including the large hill farm of Bodtegir on our boundary. Having invited a developer to do a detailed survey he then approached me to ask me to participate.

7. His motive appeared purely financial, even suggesting that, if we had wind turbines on our land, I would not need to take up the appointment in Oman as an environmental adviser to help pay for our children’s education.

8. When I put it to him, he agreed that he would not be happy if someone built a large wind farm behind his house near Ruthin.

9. After a visit to see a wind farm in Anglesey my wife and I rejected the idea as a gross affront to the beauty and dignity of the Welsh landscape around our home, making my views abundantly clear in writing to his developer, warning that I would vigorously oppose any wind farm on Mwdwl Eithin.

10. 1996. A developer from another company, Micon, arrived unannounced at our house when my wife was alone. When she protested serious concern about any such development, he said that he would use larger turbines and would therefore need fewer. I then wrote to him asking him a number of questions about his proposals, but he failed to answer those that were important from an environmental point of view.

DISREGARD FOR PLANNING REGULATIONS

11. The same year a 40 metres high wind monitoring mast was erected by the summit of Mwdwl Eithin, with a bright red light on the top of it, without planning permission. When I objected to the planning authority, an application was then submitted and permission granted retrospectively on the grounds that it was a precursor to a wind farm were not considered sufficient to refuse permission.

2003: MASSIVE NEW INCENTIVES OFFERED AS NUON TAKES OVER

The same boundary neighbour contacted my wife to try to persuade her that we should join forces with him with turbines on our land, as a new developer, NUON, had bought Micon and was offering much larger rents for turbines, suggesting that we might have five on our land earning a rent of £5,000 each annually for 25 years. I wrote to him asking for a copy of the map which he had showing the proposed turbine locations, so I could see the full extent of what he was proposing, but he failed to send it. After I tried to persuade him to drop the idea altogether, sending him written scientific evidence of the inefficiency of wind power, he refused merely saying that “others wanted the project” and “they must be a good idea.” I agreed with my family that we would let NUON come up with firm proposals, to see just what they were planning, before finally refusing to go along with them. They e-mailed me suggesting that, subject to further study, our land would be suitable for about four turbines of “up to 2 MW” installed capacity, of overall height “up to” 105 metres (345 feet) each, which “in a good year” would earn us a payment of about £6,000 each, plus additional payments for site disturbance etc. during construction. Despite further requests to see a site plan showing the proposed turbine sites, they never sent one, saying that the siting was still subject to further studies.
12. **2004.** In early 2004, I placed the whole e-mail exchange with NUON in the hands of the local press, without conditions, to show them the extent of what was being pressed upon needy farmers in our area.

13. For a short while I still maintained a dialogue with NUON’s development manager for the project, who then pressed me for a final decision on our possible participation. It emerged that they had contracted someone to carry out an ornithological study of the development site which was “time critical”. I gave permission for this, on condition that those doing the study gave us prior notice of their arrival, as I thought it would be helpful to have confirmation of our existing data, without any need to give a commitment to participate in the development.

**A Cursory Ornithological Study**

14. ADAS were subcontracted by Messrs Dulas on behalf of NUON to carry out a bird study. Of the visits that we were notified of, a different birdwatcher arrived on one day three times during the spring of 2004, mostly in appalling weather, and spent about four hours in the area. At least one notified visit was postponed but the man arrived on a later day. One of them said that he had also come earlier that week at sunset to listen for drumming snipe. (We will look carefully at the raw data for this study when the Environmental Impact Assessment is submitted with the planning application, assuming we are allowed access to it.)

15. Even assuming that their work conformed to existing guidelines, there is no way that they could have produced an accurate in-depth collection of data that represented the true situation on the development area.

**Apparent Attempt to Short Cut the Ecological Studies Prescribed by the Countryside Council for Wales (CCW)**

16. In early 2004 Messrs NUON approached CCW with a proposal to site 28 turbines on Mwdwl Eithin. (We were unable to get a copy of the map of this proposal.) CCW responded in writing to NUON with the advice attached at Appendix A, having already advised a reduction in the total number of turbines.

17. Messrs NUON then apparently instructed Messrs Dulas Ltd, themselves wind farm developers (but in my view incorrectly described to me in writing by NUON as “independent consultants”), to submit a scoping consultation document to Conwy LPA, which they did under cover of a letter dated 25th March 2004. Under the heading “5.4 Ecological issues” they described in a short 10-line paragraph their proposed ecological studies for the project. This was far short of the detailed prescription they had already received direct from CCW (Appendix A). For example, it includes the wording “… cursory inspections of mammals, reptiles and amphibians, and invertebrates.” My personal view is that this was a deliberate attempt to abbreviate CCW’s detailed advice, perhaps to lower the cost of the studies or to diminish the possibility that unacceptable impacts would be found as a result of the studies.

18. I therefore drew this to the urgent attention of Conwy LPA, whose Scoping Opinion: Information to be included within the Environmental Impact Assessment dated 26 May 2004, at paragraph 12, makes it clear that CCW’s advice (including Appendix A, as an enclosure to their letter dated 19 April 2004 is to be followed.)

19. So careless was the developers’ field work that the Scoping Proposal submitted to Conwy LPA showed one turbine sited on our land, 57 metres inside the boundary fence, despite my giving them information as to my boundaries in that area.

**Inadequacy of Government-Prescribed Studies in Evaluating Biodiversity Resources**

20. Whilst the CCW guidelines give practical guidance as to the minimum studies required, to meet a wide range of habitats, the reality is that they are only samples. The actual picture of biodiversity at the Mwdwl Eithin development site, assembled by me in 2004 and kept as a confidential document until now. I attach it herewith at Appendix B, but summarise the main points, with extracts from the appendix, as follows:
Habitat Linkages.

The wider and most important issue is that marginal habitats and their populations can be critical to the breeding encounters of any species. Safeguarding only the larger populations in key habitats can lead to genetic weakness caused by in-breeding. Just as ex situ conservation in zoos is only a temporary measure until wild habitat has been reclaimed and repopulated, so also in situ conservation of the smaller populations and their habitats is an essential part of overall species conservation.

26. Most other heather moorland in the region has been obliterated by recent farming development. The Mwdwl Eithin/Cader Dinnmael massif is a distinct habitat block, which may (for a number of species) form an important link between other similar habitat, such as Mynydd Hiraethog and Llantysilio mountain near Llangollen. It is important that this habitat should not be degraded in any way that reduces its current ability to sustain the observed species: it should remain as a link between other habitats and be managed in a way that restores and improves it. This should be regardless of whether any of the listed species have become locally extinct in the recent past.
**Spurious Claims as to the Benefits of the Development—Impacts on Biodiversity**

27. The argument that a wind power development such as the one proposed for this site will deliver a significant benefit, through its effect on global climate trends, more than compensating for the damage to biodiversity and its habitat at wind farm sites, has been disproved by good science. The threat to these sites from habitat disturbance, permanent ground water damage and subsoil degradation cannot adequately be mitigated, nor can it be justified on emission savings.

28. These impacts will include:

(a) Disturbance of underground aquifers by excavation for turbine bases (and 500 tonnes of concrete inserted in the holes), crane bases (for erection of the turbines), cable trenches, hardened access roads (for erection and subsequent maintenance), quarries and borrow-pits for hardcore building material and ancillary buildings. These aquifers support domestic spring water supplies, domestic animal water supplies and wetland habitat for wild fauna and flora. (The concrete turbine bases cannot be removed after decommissioning, so the subsoil and aquifer damage is permanent.)

(b) Destruction of natural surface vegetation and topsoil structure.

(c) Direct disturbance of flora and fauna in its habitat during construction, and to a lesser extent from routine maintenance traffic.

(d) Killing of wild birds and bats from turbine blade collisions. There is much evidence of this from the USA in particular. The wind industry denies bird-kills by wind turbines are significant but the studies which they have funded are seriously flawed. The ground has only been checked at intervals of several days, whereas scavengers such as foxes and crows remove the majority of bird carcasses within hours, often in the night before anyone can record them. This is supported by a scientific study of grouse casualties at deer fences in Scotland, carried out by the Game Conservancy Trust. One study by NUON in Holland claims that road kills of birds by traffic are significantly higher than those by wind turbines. What, I ask the Select Committee, is the relevance of this statement? Is it not similar to the argument that the landscape degradation by electricity pylons is already worse than that of wind turbines? Do two wrongs make a right? One Area of Outstanding Natural Beauty (AONB) in the south of England has recently received funding to re-route overhead pylons underground.

29. In a written answer to one of my letters, NUON claimed that:

(a) **Landscape degradation.** The land in the development area had already been industrialised by modern farming operations over recent years.

(b) **Comment.** This is in total contrast to the Clwyd-Powys Archaeological Trust (CPAT) evaluation carried out in connection with our Tir Gofal application, which *inter alia* highlighted the important traditional field boundaries which we have retained throughout our farm. Their preliminary report included the following:

(i) Recommended a further visit to look at the historic environment in more detail, usually recommended for “about 20% of consultations and usually only where the farm contains quite complex archaeology . . .”

(ii) “This holding contains several interesting landscape features.”

(iii) “. . . Irregular pattern of fields around Blodnant were possibly created at the same time or later than the Hafottai [mediaeval or late mediaeval buildings] . . .”

(iv) “Larger more regular fields in the centre and north of the holding . . . probably enclosed in the 18th or early 19th century when common land throughout Britain was enclosed.”

(c) **Emission benefits.** The benefits of the CO₂ emission-saving over threats were likely to outweigh the effects of the development on wildlife and its habitat.

(d) **Comments:**

1. According to the latest accepted figures, the net annual CO₂ savings of the now-proposed 22 MW of installed capacity (operating at a load factor of 30%) would be less than 4,000 tonnes of emissions per year (at 0.43 tonnes per Megawatt-hour). This is ahead of additional emissions to compensate for transmission loss and back-up generation.

2. This is just 0.043% of the UK Government’s total target for emission reduction by electricity generation by 2010 (9.2 million tonnes per year).

3. With this Government target being less than four ten thousandths (0.0004) of total global emissions, the savings from the Mwdwl Eithin development would be less than two millionths (0.0000172) of total global emissions. It could not possibly make any significant change to global concentrations of CO₂, let alone deflect climate change.

4. To further put it into context, this is just 0.77% of the annual emissions of a single jumbo jet flying daily from London to Miami. (520,000 tonnes—George Monbiot, *The Guardian*, 26 April 2005.)

30. When it appeared that no background noise assessment was to be made at our house, some 700 metres from (and overlooked by) one of the proposed turbines, noise-monitoring equipment was installed near our house at my request. There were severe gales and heavy rain for most of the week-long measurement and the equipment was blown over, the second time before the week had ended. The company did not consider there was any need to carry out noise monitoring in different weather conditions or during the summer months. The conclusion communicated to me by NUON direct was that most of the background noise was from a small stream (on the opposite side of the house) and that the noise of grazing animals in the summer would outweigh any noise from turbines. This belies the facts.

LOW FREQUENCY NOISE (INFRASOUND)

31. No evaluation of low frequency noise from the large number of upwind turbines has yet been given to us. The industry continues to deny that it is a threat to human health. The latest research includes the following conclusions on seismic vibrations and infrasound from wind turbines:

(a) Q. Do Fixed and Variable speed wind turbines generate detectable vibrations? A. Yes.

(b) We have clearly shown that both fixed speed and variable speed wind turbines generate low frequency vibrations which are multiples of blade passing frequencies and which can be detected on seismometer buried in the ground at significant distances away from wind farms even in the presence of significant levels of background seismic noise (many kilometres).

(c) Some of these are non-stationary at very low wind speeds where we clearly see variation in frequency over long and short time timescales and we postulate that these are generated by the interaction between the blades and the towers. There are other frequencies which are stationary and we postulate that these are caused by normal modes of vibration of the towers.

(d) We have clearly shown that wind turbines generate low frequency sound (infrasound) and acoustic signals which can be detected at considerable distance (many kilometres) from wind farms on infrasound detectors and on low-frequency microphones (Hayes pers. comm.)

WIND DEVELOPERS’ IMAGE-BUILDING: NUON’S INVOLVEMENT WITH THE WORLD CONSERVATION UNION (IUCN)

32. Noting in 2004 that NUON were gaining good publicity from their involvement in a biodiversity workshop published on the Web, I wrote to the Chief Executive of NUON Renewables at their head office in Holland protesting that their UK branch were planning a potentially highly damaging project on Mwdwl Eithin, copying my letter to the Director-General of the IUCN. I also mentioned their proposal for a huge wind farm at Allonyb in the North West, within the Solway Coast Area of Outstanding Natural Beauty, ‘causing outrage’ according to local press reports. My letter was forwarded to NUON Renewables (UK), who replied with assurances that the prescribed studies would be carried out but with no reply to the major issues.

33. NUON have now indicated that they intend to submit a planning application in December 2005 to erect 13 turbines of 22 MW installed capacity at the site. Meanwhile, a Google search on the Internet today reveals the extent of their increased involvement in IUCN as sponsors. It is clear that, as with the RSPB, who are both partners of the wind industry and at the same time fiercely opposed to specific wind turbine developments, the huge sums made available to wind power developers under the Renewable Energy Obligation, various grants and subsidies, and even Objective 1 European funding (eg the proposed Cwm Penanner development, currently awaiting an appeal hearing by public inquiry, following rejection by Conwy LPA).


34. In 2001 we looked at options for joining the Tir Gofal scheme. A detailed survey of our land was carried out by staff of CCW. During the course of discussions I mentioned that the owner of the neighbouring farm, Bodtegir, had instigated a wind farm project on the heather moorland adjoining ours. This caused some surprise, as he was already apparently trying to get a Tir Gofal contract for the same land. One of the conditions of the scheme was that open mountain and moorland would automatically become open to public access for the entire period of the scheme, ten years with a five-year opt-out.

35. When the Draft maps for Access Land under the CRoW Act of 2000 were published, he appealed against the proposed designation of his land. We also appealed against the detailed boundary proposed for access to our land, for several reasons including that some of it was cultivated grassland, and we appealed against the designation of Bodtegir land, on the grounds that an NFFO contract had by signed for a wind farm on the land turning it into an industrial site not suitable for public recreation.
36. Our appeal was partially successful, in that the boundaries were adjusted to remove the managed grassland areas from public access, as well as an area of activity with farm machinery including a silage stack. When the Provisional Map was published, we saw no legal grounds for appeal against our new reduced boundary. However, the owner of Bodtegir appealed against this further listing. The grounds for his objection (as downloaded from the Planning Inspectorate website), included the following:

(a) The land forms part of the Alwyn [sic] Valley Shoot and is shot over regularly in the shooting season.
(b) Partridge pens are erected on the land during the rearing and shooting season.
(c) The area is possibly to become a wind farm. This project is under serious consideration at this moment.

37. The appeal was rejected by the Planning Inspector.

38. It was confirmed by a neighbour soon after, as we suspected, that the owner of Bodtegir already had a Tir Gofal agreement in progress which had been running for some time.

39. Thus, there was a scheme in progress paying large annual sums of public money to conserve the natural habitat of Bodtegir, under which provision of public access was obligatory. Yet at the same time it was seriously being considered for industrialisation as a wind power station.

40. We noted that there was no mention of this land on the Tir Gofal Access Land section of the CCW website as having permissive public access on it, despite the fact that the agreement had been in force for at least two years.

41. Furthermore, it appeared to contravene accepted basic principles of wildlife conservation that an exotic species of partridge had been allowed to be introduced for purely financial reasons, to do with a commercial shoot, when there existed a remnant and highly threatened isolated population of native Red Grouse on it. It is known that French Partridges impact on the food resources of Red Grouse habitat. This appeared to be contrary to the basic aims of the Tir Gofal scheme. Furthermore, the foreign partridges invade our own land, which shares the Red Grouse population which we have endeavoured to protect and conserve for many years, without ever shooting them.

42. I thus consider this to be further evidence of the damage being caused by financial interests associated with wind farm development to wildlife resources, as well as the public’s enjoyment of the new right to roam our diminishing wildernesses.

SERIOUS FLAW IN THE CRITERIA USED BY MESSRS OVE ARUP AND PARTNERS IN DRAFTING TECHNICAL ADVICE NOTE NO 8 (TAN 8)

43. Paragraph 33 of the Draft TAN 8—Criteria used to determine the location and extent of the draft strategic areas—at the fifth bulleted point states:

44. “Each area includes some positive siting factors (defined in the project methodology as Forestry Commission woodland, due to single ownership and the presence of existing access tracks; or open access land, identified by CCW’s open access land dataset) in at least part of the area;”

45. The Countryside Council for Wales (CCW)’s own guidelines for wind farms (A Checklist for Wind Turbine Development Proposals, under CCW policy on wind turbines) states at Paragraph 15.2:

46. “Are the individual turbines sited well clear of private or public roads, railway, rights of way, bridle ways, footpaths, gardens, picnic spots, and any other places people are likely to walk or gather in (in case one of the blades should snap), and are these expressed clearly as separation distances to be maintained?”

47. In my submission to the TAN 8 consultation I challenged the Arup siting criteria, but without effect. I now put it to the Select Committee:

48. If these clear, thorough Government guidelines for the siting of wind turbines state that they should be sited well clear of rights of way and “any other places people are likely to walk or gather in,” how can Open Access possibly be siting factor in favour of wind farms? Is area access so much less dangerous or intrusive to public enjoyment of the countryside than linear access along rights of way? Does this mean that every turbine will have a (say) 300 metres circular fence built around it on Access Land to protect the public from blade fracture (as happened this year in Scotland) or ice-throw in winter?

49. I submit that this is further evidence of the callous drive for wind power at any cost, without regard for public safety or amenity.

LOCAL ATTITUDES

50. Local attitudes to wind power are influenced by the following factors:

(a) Our farming neighbours have become desperate to diversify to alternate sources of income. Until mid-2005 when I retired from salaried employment, my overseas salary provided employment for
local farmers' families, including a shepherd to help my wife run the farm and others working as subcontractors. For the last five years my salary has subsidised the farm business to an extent of more than £10,000 annually. Many are now suffering severe financial hardship.

(b) The huge sums being offered as rents for turbine sites are seen by the lucky few as a lifeline, to help feed their families.

(c) The local community is tightly interrelated, so many of those who are strongly opposed to wind power (and cannot benefit directly from it) none-the-less afraid to speak out against their close relatives or, in many cases, commercial customers (as buyers of breeding and store animals at market, hauliers, shearers, farm salesmen etc.)

(d) Division of communities. Government policy to promote wind farms has caused unpleasant disruption and division of rural communities throughout Britain. In Wales this is more serious because it has stirred up racial hatred. In our area it has divided both the indigenous Welsh-speaking community itself and relations with more recent non-Welsh-speaking residents who have bought property in the area.

(e) My wife and I witnessed an ugly incident at a public meeting at Llangwm on 27 May 2004 at which a councillor stood up and said (in Welsh) “There’s one noise pollution worse than that of wind turbines and that is the sound of the English language being spoken in Llangwm.” His speech was received with spontaneous applause. However it caused a furor and much embarrassment to the silent majority of our Welsh-speaking neighbours, who were reported afterwards to have been ashamed of what was said and gratified by the forbearance of the non-Welsh speakers present. After the meeting I went up to the councillor, an old farming friend. He shook my hand and apologised saying he had “got a bit emotional.”

(f) Similar sentiments were expressed at other public meetings during the same few months in our area, including those to discuss the Wern Ddu proposed development, near Gwyddelwern. In some cases families have themselves been divided, including that of one Welsh MP as you will already be aware.

(g) The Nuclear Lie. For many years “green” activists have been promoting the belief that wind power is an alternative to nuclear power. As our communities are vehemently anti-nuclear, this dishonest promotion for purely commercial reasons has taken a hold and is almost unshakable. Even the Welsh Assembly Government Minister for Industry, Mr Andrew Davies has promoted this lie on BBC Radio Wales in a phone-in earlier this year, saying “Well, wind is better than nuclear power”.

(h) The majority of local people have no idea of the size of the latest new generation of wind turbines, having only seen those at Llangwm, on Anglesey and in Mid Wales. Even those erected at Tir Mostyn/Foel Goch at 1.3 MW rated capacity are much smaller than those which NUON are proposing to erect on Mwdwl Eithin.

(i) Although the sums now being offered to landowners and community funds appear high, they are minimal compared with the profits that the mainly foreign owners stand to reap. All this is paid for through our taxes and our future electricity bills, but this message has not yet reached the people who will suffer most.

(j) The belief is that wind farms are “clean and green”, saving huge tonnages of CO₂ emissions from the atmosphere. However the evidence is now clear that the savings are minimal, the environmental impacts are large and, in the case of the concrete foundations (500 tonnes per turbine base) are irreversible. No-one will remove the subsoil concrete, which may already have damaged the soil structure and the aquifers which depend on it.

(k) The wind power industry appears to play down or mask the true facts behind their developments. Today the developers are almost entirely foreign companies selling foreign equipment to take advantage of the present government incentives. The Tir Mostyn/Foel Goch wind farm was sold to an American investment company even before it was built. Cefn Croes is owned by the Italian company Falck, successors in title to disgraced Enron. Even the Welsh-sounding “Tegni Cy” of Llangwm is majority owned by two large German companies. These facts are not generally known by the rural communities who are most affected by wind power development in Wales.

**IMPACT ON TOURISM**

51. Whilst only a few people can expect to benefit from turbine rent on their land (about four or five families for the Mwdwl Eithin project), a far larger number have small family-run tourist enterprises: farm visitor centres, caravans, camping sites, bed-and-breakfast rooms and self-catering cottages.

52. Although the wind industry persistently denies that wind turbines deter tourists, my own evidence is to the contrary. My wife and I ran a self-catering cottage on our farm for many years from 1983, visited by people from many foreign countries and other areas of Britain. When the issue of Mwdwl Eithin came up
in 1993, I made a point of asking them for their views. Without exception they were all horrified by the possibility, some having already seen those in Mid Wales. Of these many said they would not wish to return to stay at our farm if the Mwdwl Eithin wind farm were to be built.

53. I am sure members of the Select Committee are fully aware of the value of tourism to the economy of Wales, measured in billions of pounds and rising annually.

54. The majority of surveys of tourist and general public attitudes to wind turbines have been commissioned by the Government or by the industry itself, with loaded questions and flawed results. Questions have included “Would you rather have a wind farm or a nuclear power station near your house?” Notable was the Mori Poll of tourist attitudes to wind farms in Scotland which was later exposed as a thorough scam. One of the fundamental flaws in these polls has been that few of those questioned have ever seen the new generation turbines.

55. In contrast to the carefully prepared wind industry and Government polls, BBC Countryfile, on 26 October 2003 ran an instant telephone poll of listeners with the following question: “Would be happy to have a wind turbine near your home?” The response out of a total of 36,566 votes was as follows:

1. NO—20,234 votes —55%
2. YES—16,332 votes —45%

56. These figures were at a time before any of the new generation of massive turbines had been erected in Britain, so the voters had no idea of the size and their impact during construction.

57. Any suggestion that wind farms can be a tourist attraction is negated by the closure of the Delabole wind farm visitor centre in Cornwall which became insolvent through lack of visitor interest. At least one similar closure has happened in the USA. If such a novelty, set up at a time the cost and environmental damage of wind farms was still not widely known, has failed, how is it possible that the many wind farms now being built all over Britain can interest tourists?

**IMPACT ON PROPERTY PRICES**

58. We believe that in 2002 we lost several thousand pounds on the sale of a cottage, when a keen prospective purchaser asked me if there were any wind farm proposals in the area and I told him of the Mwdwl Eithin one. He then dropped out of the sale, after which we accepted a lower offer from the current owner.

59. Manipulation of the facts. The Department for Trade and Industry website on “myths about wind power” at 04/DTI Renewable myths.htm states the following:

**Myth: Wind farms devastate house prices**

The facts:

— A study by the Royal Institution of Chartered Surveyors suggests that wind farms have no lasting impact on UK house prices.

— This study is supported by evidence at wind farms in England, Scotland and Wales.

— It shows that local house prices recover from any initial impact once a wind farm has been operating for two years.

— Evidence suggests that those living nearest to wind farms are their strongest advocates.10

— People promoting fears of falling prices risk making them self-fulfilling.

60. I submit to you that this is little short of a brazen lie. The RICS report Executive Summary actually says the following:

“60% of the sample suggested that wind farms decrease the value of residential properties where the development is within view”

“67% of the sample indicated that the negative impact on property prices starts when a planning application to erect a wind farm is made”

[and]

“Once a wind farm is completed, the negative impact on property values continues but becomes less severe after two years or so after completion”

61. To any literate reader, the meaning of the words “becomes less severe” is very different from that of “house prices recover from any initial impact”.

62. The well-known court judgement in Cumbria of course resulted in a substantial award of compensation to a house purchaser who was not told by the seller of an imminent wind power development near the house before he signed the contract to purchase it.
IMPACT ON WATER SUPPLIES TO NEIGHBOURING PROPERTIES

63. I have pointed out to the Local Planning Authority that the hydrological studies do not include physical sampling of geological structures below the surface. As several of our neighbours, our domestic water supply is extremely fragile, especially during drought conditions, although it has never dried up. We are privileged to own a wholesome private supply of drinking water. The LPA have not yet been able to give us a concrete assurance that they will guarantee to refuse permission for certain turbine locations if there is any risk to our water supply. (Although temporary disturbance may foul the supply during construction, that is not our primary concern: it the permanent damage that cannot be mitigated.) Initially it was suggested that it would be a contractual matter between the wind power developer and ourselves and that we would have to take him to court if our water supply was diminished.

64. That situation is totally unacceptable. There is no mains water within our valley, nor any prospect of its being provided, in view of the distance and altitudes involved. Nor do we wish to pay water charges for the rest of our time, for a supply that is inferior to our present spring water.

65. Thus our evidence is that if a wind farm threatens a private water supply, the public authority will not protect us from the development.

CUMULATIVE VISUAL IMPACTS—CREEPING BLIGHT: THE “THIN END OF THE WEDGE” TECHNIQUE USED BY DEVELOPERS

66. There is already ample evidence that wind power developers are abusing the planning system by a strategy to gain planning permission for a single or small group of turbines, with a limited visual impact, and then following this soon after with a further phase of development. The Hafotty Uchaf site at Llangwm is now at its third phase of development, having started with a single turbine, the first to be erected in mainland North Wales. Moel Maelogan is now about to enter a much larger second phase, having started with only three turbines. An example of the corruptive technique used through the Environmental Assessment process was published by Messrs Dulas Ltd on their website. In an abstract of their Environmental Statement for the Carno extension, published in 2004 on their website, they attempt to mitigate and justify the extension in the following words:

“It is undeniable that the wind farm will constitute a new visual aspect in the landscape for users of the bridleway and the footpath. However, users of these public rights of way will already be accustomed to the existing Carno wind farm and the proposal for an extension to this wind farm will not constitute an entirely new element in the landscape.”

CONCLUSION

67. I believe that the foregoing evidence, case history from the front line, shows how wind power development in Wales:

(a) Delivers net damage to the natural environment of Wales, much of which is irreversible.
(b) Damages human settlements, risking loss of water supplies, visual amenity and rural peace without compensation.
(c) Significantly reduces the value of domestic property.
(d) Makes insignificant contributions to the reduction in global emissions, so small that they cannot possibly deflect global climate change.
(e) Damages the economy of Wales through damage to the very foundation of rural tourism, the Welsh landscape and all that it contains.
(f) Directly damages small tourism-related farm diversification enterprises at a time when farm incomes are at their lowest ever.
(g) Drives development for financial reasons only, mainly by foreign developers, providing a market for foreign equipment, and as a fast-moving cash investment.
(h) Divides communities, exacerbating racial tensions in some areas, by benefiting a small number of farmers and landowners at the expense of the rest.

68. I conclude that, although there are many people working to protect the environment who genuinely believe that wind power will make a contribution to the long-term protection of biodiversity, the huge financial incentives now made available to investors from all over the world has corrupted the mechanisms by which non-governmental organisations interpret scientific research, even corrupting the scientific process itself. Wind power is now all about making money, the natural environment becoming the servant of big business which is now mercilessly exploiting it.

(Annexes not printed)

November 2005
Supplementary Written Evidence from David H Insall

INQUIRY INTO ENERGY IN WALES—SUPPLEMENTARY SUBMISSION BY D H INSALL

1. Further to my submission of evidence of 10 November 2005, I now submit further evidence relevant to Item 3.d., “wind farms”, in view of a specific event which is strong collateral evidence to support the contention in my first submission that there has been corruption of the processes that are designed to ensure objective environmental impact assessments are carried out.

2. This in my view supports the contention that elements of the wind power industry are continuing to exploit the planning system in their pursuit of financial gain.

JOINT FINE-TUNING OF THE PLANNING PROCESS BY CONWY AND DENBIGHSHIRE COUNTIES

3. During recent months the two counties have commissioned consultants (Arup) to carry out fine-tuning of the boundaries of the Clocaenog Forest SSA “A”, as recommended by TAN 8.

4. This resulted in a Draft Supplementary Planning Guidance published on the Denbighshire website but not released for public consultation at that time. The reason for this was that in their first appraisal the consultants had failed to address biodiversity issues in finer detail in accordance with TAN 8.

5. Messrs Arup were then asked to revise their evaluation to take non-statutory biodiversity conservation areas into account, with advice from the Countryside Council for Wales and the Royal Society for the Protection of Birds. This resulted in a revision of the earlier draft, which had included Mwdwl Eithin as a separate sub-zone of the SSA, but in the new draft was now excluded completely from the SSA.

6. The consultation closed on 17 March 2006 with the two counties now evaluating the responses.

DISTRIBUTION OF LEAFLET BY MESSRS NUON RENEWABLES LTD

7. On or around 24–25 March 2006 leaflets were distributed by Messrs NUON to postal addresses in the Cerrig-y-Drudion and Llanfihangel, including a "survey" form requesting details of respondents and giving a Cardiff Freepost address for return of the forms. Three pdf image files are attached to the e-mail covering this letter, scans of all or part of the leaflet. It announced presentations to take place at short notice in Cerrig-y-Drudion and invited recipients to put their completed “survey” forms in a box at the venue.

8. The attention of the Inquiry Members is drawn to certain aspects of the leaflet including the following:

(a) Blatant attempt to Bypass the Public Consultation Process. The wording of the leaflet includes the following:

(b) “Policy changes recently suggested by Conwy and Denbighshire County Councils might lead to local decisions on the proposal being discounted and to the planning application being rejected with applying the usual planning tests. NUON is opposing these changes and seeks local opinion regardless of what may happen at County level.”

Comment. Here we have a company, which has hitherto claimed to place environmental care at the top of its agenda in many letters held on record, now trying to destroy the work of the environmental agencies and those caring local people who wish to preserve the biodiversity of Mwdwl Eithin and its spiritual value as an outstanding historic landscape. What they wish to do is, in my opinion as an environmental consultant, nothing less than an environmental crime. Their agenda is to sell the soul of our cherished countryside for their obscene profits.

(c) False Statement of Emission Savings. A claim that the project will save 58,762 tonnes of Carbon Dioxide annually.

Comment. This is so far from the truth that their apparently fraudulent claim is being reported to the Advertising Standards Authority. They have no business to claim displacement of coal-fired generation of electricity. It should be for mixed source generation.

(d) False Statements on their Website, linked to the Leaflet. Reference to their company website for further information. This website contains a number of misleading statements, including a serious mis-quotation of the views of the Royal Institute of Chartered Surveyors on the impact of wind farms on property prices.

(e) Comment. This likewise has been reported to the Advertising Standards Authority, because of the seriousness of the misrepresentation of the RICS professional views, following their much-publicised survey amongst their members.
CONCLUSIONS

9. It has become clear that Messrs NUON’s written assurances that they would not proceed with a development that impacted adversely on the natural environment of Mwdwl Eithin were worthless. Their environmental agents, said in writing by NUON to be “independent” consultants, have already been shown to have serious commercial vested interests as partners in the wind power industry. Thus NUON’s environmental credibility has been totally undermined. Their prime motivation can be seen as profit at our expense.

10. It is worth noting as a footnote that just three months ago their parent company nv NUON signed an agreement with a major conglomerate in Spain to sell them the entire NUON wind farm stock in Spain. How long will it be before we see NUON selling a chunk of our beloved Welsh countryside to another foreign investor? Maybe just as soon as they get planning permission, if we fail to oppose it?

30 March 2006

Written Evidence from Dr John R Etherington

MY QUALIFICATION TO COMMENT

Undergraduate years and then a period of postgraduate work and teaching at Imperial College (University of London) during the 1950s–60s. I became Reader in Ecology in the University of Wales (Cardiff) and retired in the 1990s. Much of my research and teaching was in the field of environmental chemistry and physics in a plant ecological context. During the past decade I have researched the contribution of renewable generation to the power industry with particular attention to wind power.

LAYOUT

This submission is presented under the same headings and subsections utilised in the Welsh Affairs Committee Press Notice inviting submissions.

ENERGY IN WALES

SUMMARY

— The over-provision of Wales with generating capacity should be examined.
— The integrity of the UK National Grid should not be sacrificed by fragmentation into Welsh and other regions.
— If the UK Government proceeds with new-nuclear development it would be a mistake for Wales to take a separate course.
— Proposals for LNG power stations on Milford Haven have significant implications for other developments in Wales, including unpredictable renewables.
— Clean coal technology with CO₂ sequestration has unresolved international legal implications.
— Wind power is becoming a progressively less attractive option as its limited and unpredictable generation and remarkable level of subsidy are examined.
— A moratorium on wind power deployment should be imposed until a full and independent cost-benefit analysis is undertaken.
— Dedicated crop biomass and bio-fuel production pose very serious problems of cost-benefit which must be examined before further development.
— Tidal energy suffers environmental constraints which limit the available energy potential.
— Whilst hydro-electricity is a mature technology there are few sites for its further expansion in Wales.
ENERGY IN WALES: Inquiry into:

1. UK GOVERNMENT POLICY IN RELATION TO:
   a. and b. Current and future energy needs of Wales and its provision

   According to WAG (2002), Wales is over-provided with generating capacity by at least 1.5 times the UK per-head average, and generates over 1.75 its requirement, exporting the surplus to England. I ask whether this is a desirable situation for Wales unless Welsh electricity is to become an independent Welsh industry and exporter in its own right. This seems a bad idea as the UK has been well-served by possessing an integrated National Grid for almost 70 years.

2. THE RELATIONSHIP BETWEEN THE UK GOVERNMENT AND THE NATIONAL ASSEMBLY FOR WALES—including the division of powers—on energy policy

   As the UK profits from an integrated National Grid, this arrangement will probably continue. Thus it is necessary that central control of the Grid should not be jeopardised by reason of Welsh national control (nor control of separate areas by any constituent country of the UK).

3. THE CURRENT AND FUTURE PORTFOLIO OF ENERGY Provision IN WALES:

   (a) Nuclear energy

   A decision to resume construction of nuclear power stations, or not, must be taken as part of the strategy of serving the requirements of a UK National Grid. Despite my personal wish that we should not resort to nuclear new-build, it seems very likely now that it will happen. See discussion of Mr Blair’s remarks on this matter in The Times, (21 November 2005), following Sir David King’s statement to the Commons Environmental Audit Committee that “No government in the world would switch off its power stations to maintain carbon dioxide levels below 400 parts per million, if this seemed to threaten the country’s economy”. The unwelcome truth is that it is just not possible to provide CO₂-free generation in anywhere near adequate quantity from renewables.

   If the UK resumes a programme of nuclear new-build, there are several implications for power in the UK and Wales.

   If new-nuclear construction is sanctioned it then seems logical that we should expand it to the same sort of percentage that France has operated so successfully for many years—approaching 80% of average generation.

   This would provide all base-load generation from more or less CO₂-free electricity and allow government easily to achieve its wish for 60% of CO₂-free generation by 2050.

   The remaining 20% of average running generation would need to be provided by totally firm but rampable generating capacity (nuclear cannot easily be ramped up or down). This controllable capacity would best be provided by gas-fired generation supported by coal fired integrated gasification combined cycle (IGCC) plant.

   If this 80% contribution from nuclear power were to be achieved, a large amount of unpredictably intermittent wind power (needing an installed capacity over three times its average yield) would be an embarrassment to the system. It is indeed folly to continue the expansion of wind without considering what will happen if a large nuclear fleet (c. 80%) is built, and how the massive wind-induced fluctuation of generation would be backed up or absorbed in our islanded UK system (See d. below: E.ON2005 and ESB 2004 on backup power).

   If such a large expansion of nuclear is imposed upon Wales and the UK, it will more than satisfy the 60% CO₂ emission target for 2050. It is now a crucial question for the environmental movement—which is worse, nuclear power or CO₂. If the scare-mongering about CO₂ is remotely true (tens of thousands of deaths already according to the University of Wisconsin—Madison research group, using WHO data) then nuclear power, with comparatively very few radiation deaths has to be discussed during this review without a hysterical background of denial by green campaigners.

   (b) Liquefied natural gas

   Milford Haven is to become a centre for the importation of LNG and nPower-RWE has proposed a 2.0 GW CCGT power station on the Haven. A second gas station is also possible, so South Pembrokeshire is destined to become the major generating centre of southern Wales. Should these stations generate even 3,000 MW in total, this would be over six times the 2010 Welsh windpower target. In conjunction with the problems of wind power, this suggests that it may be a mistake to invest further in windpower with its very limited, expensive yield and problem of unpredictable output (d. below).
(c) **Clean coal technology**

Clean coal technology is to be welcomed but for full effect on the CO2 situation it must incorporate sequestration. Without extensive discussion I draw attention to a legal constraint. The only suitable sites in the UK are worked-out North Sea oil/gas strata and the IPCC has recently noted that the London and OSPAR Conventions that potentially apply to the injection of CO2 into the geological sub-seabed were drafted without specific consideration of CO2 storage and “No formal interpretations so far have been agreed regarding whether . . . CO2 injection into the geological sub-seabed or the ocean is compatible with certain provisions of international law.” (IPCC, 2005). Sequestration in the UK may be a decade or more ahead, even if economically feasible (DTI 2003).

(d) **Wind farms**

*d(i)* **Introduction.**

The Government’s own figures falsify the assertion that we need wind power to combat “global warming”. The key figure is the 2010 target of 9.2 million tonnes of CO2 per year (Mt CO2/y) to be saved by renewables, mostly wind power (DEFRA 2004). Ludicrously, this is less than the annual emission from one medium-sized fossil-fuelled power station!

The world total emission is 24,240 Mt CO2/y (OECD 2005). So the saving attributable to renewable electricity generation would be, at most four ten-thousandths of global emission (0.04%)! Even now in 2005 wind power in the UK provides barely 0.5% or total electricity generation (DUKES 2005).

We could assume this to be our “widow’s mite” many of which would provide the “whole” but to do so ignores the huge expense of windpower and the lack of democratic consultation about which CAP (July 2005) reported:—“By 2010, the cost of the Renewables Obligation, which does not appear on electricity bills and is not explained to consumers, is expected to reach £1 billion per annum” and “The Renewables Obligation is currently at least four times more expensive than the other means of reducing carbon dioxide currently used in the United Kingdom . . .”

The CAP also noted: “the Department [DTI] has not consulted consumers, or their representative groups, about their willingness to contribute to the cost of renewable energy . . . [but] . . . ‘in 2004, a new planning statement was issued [ODPM] . . . The statement increases the chances of hitting the 2010 target, but only by reducing local communities’ influence on the planning process.”

I believe these matters are of grave concern to the people of Wales and the UK and perhaps should be addressed by a wind power moratorium after which the whole industry should submit to an independent cost/benefit analysis.

*d(ii)* **Unpredictable intermittency.**

Over the past two years the operator of the largest wind power assemblage in the world, E.ON Netz has twice warned of this problem. Eg E.ON (2005):

“Wind energy is only able to replace traditional power stations to a limited extent. Their dependence on the prevailing wind conditions means that wind power has a limited load factor even when technically available. It is not possible to guarantee its use for the continual cover of electricity consumption. Consequently, traditional power stations with capacities equal to 90% of the installed wind power capacity must be permanently online in order to guarantee power supply at all times.”

The Irish National Grid (ESB 2004) referring to western British climatic conditions wrote that:

“As wind contribution increases, the effectiveness of adding additional wind to reduce emissions diminishes... [and] the cost will be very substantial because of the back up need”.

In May 2005 the Council for Science and Technology (CST) warned government of the requirement for backup capacity which, “if deployed on a significant scale . . . will almost inevitably be fossil (gas-fired) because of the flexibility required”. It concluded: “For these reasons, it is not possible to meet the challenging CO2 objectives in the medium term without large-scale technologies which do not add to the carbon burden...” At the moment the only tried technology which comes near to solving this problem is nuclear power.

Almost the only recent dissenting voice has been that of the Oxford Environmental Change Institute’s report (OECI 2005) suggesting that common mode failure caused by low windspeed was uncommon. Unfortunately this report was based on analysis of incidence of zero-generation, not on the much more relevant reduced-generation conditions which very frequently coincide throughout the UK. The “rare” occurrence would be the entire Welsh or UK wind power fleet producing anything near maximum generation (Ofgem 2005).
**d(iii) Subsidy**

Wind generated electricity is subsidised by the Renewables Obligation (RO) plus its market increment plus the Climate Change Levy exemption (CCLe). This subsidy alone amounts to nearly twice the value of conventional generation and is more than 25 times that on coal-fired generation per MWh. Gas and nuclear generation are currently not subsidised at all. In 2003 the DTI’s *Energy White Paper* said:

“We have . . . introduced a Renewables Obligation for England and Wales in April 2002 . . . The cost is met through higher prices to consumers . . . By 2010, it is estimated that this support and Climate Change Levy exemption will be worth around £1 billion a year to the UK renewables industry.”

Barely two years latter the House of Commons CPA (2005) reported that “The Renewables Obligation is currently at least four times more expensive than the other means of reducing carbon dioxide currently used in the United Kingdom . . .” and as noted in the Introduction d(i): “By 2010, the cost of the Renewables Obligation, which does not appear on electricity bills and is not explained to consumers, is expected to reach £1 billion per annum.”

Additionally, the CPA drew attention to the lack of democracy in the RO arrangement: “the Department [DTI] has not consulted consumers, or their representative groups, about their willingness to contribute to the cost of renewable energy”.

**d(iv) Planning**

The CPA’s (2005) report also questioned the impact on planning:

“. . . in 2004, a new planning statement was issued . . . The statement increases the chances of hitting the 2010 target, but only by reducing local communities’ influence on the planning process.”

The consequence of this statement (PPS 22), its Welsh equivalent (TAN 8) and the longer-standing Scottish NPPG6 has been a redoubling of public concern about windpower. The CPA perceptively said “. . . the likely rapid expansion of onshore wind power in the next five years could create a public reaction against renewable energy.” It has.

**d(v) Rural economy—housing and tourism**

The “public reaction against renewable energy”, which began long before the CPA’s statement, is fuelled by perceived impact of wind power on landscape—already a substantial disaster in some parts of Wales, but there is also fear of an economic impact.

The wind power industry vehemently denies any such impact but facts speak louder than their words.

A family from Marton, Cumbria, was awarded compensation by a district judge because a vendor failed to disclose a wind farm proposal. A valuer in mid-Wales has suggested a probable 25% reduction in house value caused by a proposed windfarm and at Lethbridge in Devon, two independent valuers predicted that a farm property will lose £165,000 in value (Property 2004–05)

As a more general point, the Royal Institute of Chartered Surveyors (RICS 2004) has reported a survey of its members in which “60% of the sample suggested that wind farms decrease the value of residential properties where the development is within view.”

The impact on tourism may also be substantial (Tourism 2003). In 2003 a Welsh Tourist Board survey concluded that “Just over half of the respondents thought wind farms have already and will continue to have an adverse effect on visitors coming to the area.” And we have not even started building a lot of big ones yet! Outside Wales, a survey by VisitScotland which was effectively conducted “blind” was even more frightening about the impact on tourism; over a quarter of tourists saying they were unlikely to return to a “turbinised” landscape.

**d(vi) Conclusion**

There are now so many validated objections to wind power which is not only very expensive but also an ineffectual way of saving CO2 emission, that a moratorium on further wind power deployment should be called and an independent cost-benefit study undertaken in Wales and UK-wide.

Considering that tourism is now the main source of rural income in Wales and that rural housing represents a huge national investment it is necessary for this reason alone that such a moratorium should be called.
(e) **Biomass energy**

I comment on this section as a professional environmental biologist who previously researched on plant photosynthesis and dry matter production.

The local use for heat and power of waste biomass from agriculture or forestry would be a valuable small economy. If any larger scale use is proposed, full life-cycle analysis must demonstrate that energy costs, particularly of transport, do not outweigh energy yield.

Dedicated cropping of fuel biomass such as coppice willow or Miscanthus grass or biomass for bio-fuel production is a non-starter despite intense pressure from government and agriculture to develop it. I draw attention to the accurate analysis presented by the Royal Academy of Engineering RAE (2002) to government in their response to the Energy Review:—“It would require the whole of Kent to be covered with coppiced willow, for example, to replace the output of Dungeness B power station on the Kent coast.”

The venture into dedicated cropping for production of bio-ethanol or bio-diesel is even more counter productive as recent research shows that more energy is expended in producing and converting the crop than is recovered as fuel energy. (Pimentel and Patzek 2005). In the case of bio-diesel up to 118% more fossil energy was used than made available in the bio-fuel!

I have long pressed the point that subsidised fuel production with energy crops would cause agricultural land to be sacrificed—possibly deflecting crop production unethically as cash cropping to the underdeveloped world or resulting in valuable wild-land being converted to energy production. The latter is already happening (New Scientist 2005).

(f) **Geo-thermal energy**

I have no specific knowledge or expertise but suspect that only a tiny contribution could be made in Wales.

(g) **Tidal and wave energy**

(g(i)) **Introduction**

It is a pity to subsume tidal and wave under a single head as tidal energy is fully proven in its impoundment form. La Rance, in Brittany, is the largest tidal impoundment in the world, at 250 MW, whereas wave energy is literally in its infancy with less than 2 MW installed capacity in the UK and no production-scale installation in the world as yet.

The extant generating capacities of wave and tidal installations should be viewed in the light of the UK’s total running average generation of 45,000 MW!

(g(ii)) **Wave energy**

There are but two significant trials in the UK. The Wavegen Limpet (shore installed) provides no more than 0.5 MW maximum and the Pelamis (floating) only 0.75 MW. Three Pelamis units are proposed in Portugal as the world’s first ever commercial wavepower station, giving just 2.25 MW which will load-factor down to less than 1.0 MW yield. My personal view is that limited yield, slow development and the risk of destruction by storm force weather makes wave power an unlikely contender for substantial renewable generation.

(g(iii)) **Tidal impoundment.**

Wales has claim to half of the largest potential resource in the UK:—the Severn Barrage with which would have a generating capacity of 8,640 MW was predicted to produce 7% of UK requirement but was never built, for environmental and economic reasons. A recent feasibility review was ignored by DTI (2003). Environmental constraints prevent any impoundment technology in Wales, including low level tidal lagoons, from being a front runner in renewable energy generation.

(g(iv)) **Tidal current.**

Several prototype tidal current generators are under test, some in Wales but so far with installed capacities of between 0.15 and 1.0 MW, suggesting that no more than a token contribution can be expected from these sources in the immediate future.
(h) Hydro-electric energy.

This is the one source of substantial renewable energy which is proven in long term use in Wales. Our largest is the 50 MW Cwm Rheidol scheme but this usually achieves less than 20 MW annual average, being limited by water availability. Unfortunately most large scale hydro- sites in Wales and the UK have been exploited, so significant expansion is unlikely.

REFERENCES AND NOTES


DEFRA (2004) Consultation on the review of the UK Climate Change Programme (the report actually gives a figure of 2.5 Mt carbon/year, which is equivalent to 9.2 Mt CO₂).


DUKES (Digest of UK Energy Statistics 2005).


OECD Factbook 2005.


Ofgem (2006) ROC Registers and Annual Reports on the RO.


RAE (The Royal Academy of Engineering 2002) An Engineering Appraisal of the Policy and Innovation Unit’s Energy Review.


28 November 2005

Written Evidence from Paul Spare

INTRODUCTION

I have prepared the submission below answering the main points in the order of the listing. I shall concentrate on the supply of electricity since it is my considered opinion it is the most critical energy source. It cannot be replaced for most application, it cannot be stored and it affects almost every function in an advanced society, eg financial transactions, food supply/distribution, health and education services, water supply/sewage, domestic life and heating.


The population of Wales is about 3 million and electricity consumption about 5% of the UK total. Electricity consumption is therefore likely to be about 22 TWh by the end of the decade. Although there have been many save-it-an economy campaigns in the last 30 years, they have had a negligible impact on consumption. It continues to increase in Wales as in England and most European countries at about 1–2% per annum.
The main sectors in which Wales can provide a respectable proportion of its own requirements are:

- Electricity from nuclear plants;
- Coal;
- Wind power;
- Hydroelectric;
- possibly wave power.

Coal, nuclear power and hydro plants have made very substantial contributions in past decades and should be utilised in similar ways in the future.

2. UK Government and the National Assembly for Wales

The National Grid control and distribution system has worked very well for the last 50 years and must continue largely unchanged. The responsibilities of the Assembly should therefore be subservient in most respects to the policy for the UK, although there could be some second tier issues handled by the Assembly.

3. The current and future portfolio of energy provision in Wales

I should like to offer my submission on the above topics in a slightly different order.

(a) Nuclear Energy

The Wylfa Magnox plant on Anglesey has been operating for over 30 years. It produces about one third of the electricity used in the Principality. The Magnox nuclear plant at Trawsfynydd was closed about 10 years ago and is part way through decommissioning. Wylfa produces less than 1% of the CO₂ produced by the equivalent coal plant. It will probably be closed in less than 10 years. A similar vary large reliable source of greenhouse gas free generation is needed if the CO₂ emissions from Wales are not to increase very substantially.

It would appear highly desirable to undertake feasibility studies for a second nuclear plant at Wylfa to begin generating when Wylfa closes. The infrastructure required for continued generation is there, the highly experienced and motivated workforce is available. A second plant will provide high quality, secure and safe employment for a range of occupations until well past the middle of this century.

The annual electrical output from Wylfa is approximately:

\[ 1,081 \times 1,000 \times 0.8 \times 24 \times 365 = 7.6 \times 10^9 \text{kWhr} = 7.6 \text{TWhr}. \]

A typical 1.5 MW wind turbine produces about 3.3 GWhr per year (8,760 hours and 25% of full output). It would therefore take about 2,300 large wind turbines to achieve the same quantity of carbon-free generation. Such turbines would have to be backed up by substantial fossil-fuelled plant to cope with winter anti-cyclones or other periods of poor performance.

(b) Clean Coal

Coal use in the UK is about 30 million tons indigenous and about the same imported. On a pro rata basis, about three million tons of home produced coal would be required from Wales. This could be achieved, but would require new collieries to be opened. There are at present no full size power stations that qualify for the description “clean coal”. Development is proceeding very slowly and new commercial power stations are affected by the same uncertainty about the electricity payment system that is preventing all large power station construction.

The “clean coal” processes in any case do not include carbon capture. The additional complexity that this will cause to the plant, the lower thermal efficiency (and higher fuel consumption) and the extra costs make it extremely unlikely that large coal-fired plants will be commissioned within the next 10 years.

(c) Hydroelectricity

The citizens of Wales can be proud of the important contribution that their hydro electric plants make to the operation of the electricity supply system in the UK. Plants such as the pumped storage systems at Dinorwig and Festiniog, plus Maentrog, Rheidol, Dolgarrog have worked with the nuclear power stations at Trasfynydd and Wylfa to demonstrate the immense value of pumped storage in operating the UK grid system.

There would seem to be little appetite at the present time to build additional large hydro plants. I would urge the Committee to review this decision. Hydro electricity is the only low-carbon, controllable alternative to nuclear plants. If neither large hydro nor replacement nuclear plants are built in Wales, then CO₂
emissions will rise from their present level to those of some of the non-nuclear states in Europe, such as Ireland. The UK is committed under the Kyoto protocol to reduce total greenhouse emissions over the period 2008–12 by 12.5% relative to 1990.

(d) Liquefied natural Gas

UK reserves of natural gas have reached a plateau and the period of inexorable decline. In the 35 years since conversion from burning Towns Gas began we have reached the point where about 75% of homes in the UK now depend upon gas for central heating. These households need secure supplies for decades to come. The process of producing Towns gas could be resurrected, but would require tens of millions of appliances to be replaced or converted. More seriously however, it would require millions of tons of coal and even then, current environmental standards would probably make it prohibitively expensive. The only practical option is to import natural gas by pipeline or in liquid form (LNG) by tanker.

When I was a scientist at the British Gas Midlands Research Station in the 1970’s, colleagues who working on LNG storage were most concerned about LNG safety issues. If much larger quantities of LNG are to be imported, suitable port storage facilities must be provided and only in exceptional circumstances should it be stored near residential areas.

(e) Wind Power

Wind power is normally considered as the first choice renewable source. The largest wind machines have a Declared Net Capacity (DNC) of 2 MW. However, there are very few machines of this size operating and some technical problems have emerged—one of the two in the UK was taken out of service after a lightning strike. It is also unlikely that 2 MW machines would be acceptable in many sites, because of their massive height and requirements for solid structural anchorages. It is therefore prudent and conservative to assume an average machine size of 1.5 MW in calculating the number of machines required far into the future. If technical advances do not continue and smaller machines are used, the numbers will have to be increased to compensate. The 1,000th turbine was commissioned in 2002.

A 1.5 MW turbine operating continuously for a year would produce 13 140 000 kWh. Wind output is intermittent but, if it is assumed that 25% availability is achieved continuously, through an appropriate geographical distribution (20% is European average), the number of machines can be calculated. As calculated above, to replace Wylfa would require about 2,300 turbines.

Installation offshore is more costly and complex than on land, requiring tubular piles 30 metres long to be driven into the sea bed. I know of no means of removing them at the end of turbine life.

There have been many studies by professional engineers in recent years warning this Government and its predecessors that renewable energy sources have significant drawbacks, in particular suffer from the risk of ‘common-mode’ failure in unfavourable weather conditions. The last week has provided convincing evidence that the renewable schemes in which the Government has such confidence for our future energy supplies are revealing this failing.

For almost a week in mid-November, there has been a freezing anticyclone over England, Wales and most of Scotland and it is forecast to continue for many more days. Demand for gas and electricity is reaching levels close to the winter peak, causing gas prices to reach 80 pence per therm. The output from the 1,000 wind turbines in the past week has hardly risen above zero.

Our electricity grid distribution system requires engineers to match instantaneous supply and demand every second of the day. Wind turbines are uncontrollable, responding only to the natural forces of the weather. Wind turbines require backup equipment to accommodate their unpredictable diurnal and seasonal output variations. To maintain grid voltage and frequency within limits, it will be necessary to have large fossil (or possibly nuclear) plants operating as spinning reserve for a high proportion of the year. These plants will have their turbo-generators synchronised to the grid frequency, but be operating in a highly inefficient manner as they will be consuming fuel only to overcome losses. They will be wasting their fuel and producing no useful output, with all their full staff and overhead costs. All of these must be added to the costs of wind power, because it is the turbines that are forcing these fossil or nuclear plants to operate inefficiently.

(f) Bio mass

Biomass plants (power stations burning firewood) are now being proposed for future power supplies. They should achieve higher availability—80%—than other renewable energy sources. To generate two TWh per annum (10% of Wales electricity) would require 260 MW of such plants (at 80%). The calorific value of the coppice biomass material will be at best about 33% that of crude oil. An output of 1,000 MWe requires about 1.4 million tons of oil per year and 0.4 million tons of oil to generate 280 MW. Therefore 1.2 million tons of wood would have to be incinerated to generate 280 MW.
The Forestry Commission has estimated the maximum production of wood from coppicing to be 6.8 t/acre per annum—17 t/hectare or 1700 t/km$^2$.

1.2 million tons of wood would require about 710 km$^2$ of dedicated land

The environmental damage is not restricted to the appearance of the coppicing. The transport of 1.2 million tons of wood would have very severe adverse effects on the rural communities, agriculture, the roads and the wildlife. If there were six power plants rated at 50 MW, each would require 200,000 tons of fuel annually, or about 100 lorry loads per day. The scheme would require a fleet of about a hundred vehicles, all of which would be burning diesel, be producing CO$_2$, CO and other noxious gases and be causing rural traffic dangers.

The plants themselves produce waste gases. Air quality in the UK has improved dramatically over the past 40 years through four main effects.

- Closure of small local coal-fired power stations;
- Expansion of the nuclear programme/imports from French nuclear stations;
- Replacement of coal by north sea gas;
- Replacement of steam engines by diesels.

The proliferation of small wood-burning plants will bring problems with the control of emissions and pollution that were last experienced 40 years ago. It must be recognised that EC regulations will require them to comply with environmental impact assessments, Best Practical Environmental Option (BPEO) studies, effluent discharge authorisations, QA procedures and verification arrangements.

The routine monitoring of small plants would place great stress on the Environment Agency and other regulators. Instead of one large MW plant having a single control system, run by specialists, there will be multiple plants operating independently, with unqualified part-time staff, making management failures and prohibited releases more likely. Regulations always cause greater proportionate costs on small organisations. Current plans for wood burning involve plants less than 10 MW, so as to blend into the rural landscape, but even some of these small schemes have been rejected, as planners insist that generating plant is not compatible with a rural situation and is sited in an industrial area. If developers are forces to use very small plants, > 50 plants would be needed, all emitting waste gases, generating ash and producing liquid effluent for regulators to monitor.

If ash production is only 2% of fuel supplied, there will still be 20,000 tons for disposal every year. What landfill sites can take such wastes? What toxic or carcinogenic substances might they contain—polycyclic aromatic hydrocarbons? What are the implications for watercourses? What BPEO studies have been carried for waste disposal?

Government commitments to increase species diversity will be nullified by the planting of several hundred square km of monoculture crop. These large areas of a single species will present an ideal breeding habitat for pests and viruses that do not trouble nuclear or large fossil fuel plants. Biomass would also be vulnerable to changes in weather patterns, such as flooding and droughts. After prolonged drought there could be very serious fire risks to neighbouring villages. How will productivity be maintained without the use of artificial aids such as fertilisers and insecticides?

During the Foot and Mouth epidemic, large areas of the countryside were closed and all stock and vehicle movements banned. If such an event were to happen again, wood harvesting would have to stop. There would be a choice between electricity and Foot and Mouth containment.

(g) Wave and Tidal

Wave power has been proposed as being well suited for generating electricity in an island nation. The waves and tides appear extremely dependable. Schemes have been investigated with public funds since the 1970s, but have proved difficult to scale up to industrial size. To generate 2 TWh per annum from wave plants would require 900 MW of plant (assuming an optimistic 40% availability). The prodigious quantities of energy in the oceans are diffuse and unpredictable, extending from dead calms to storms that can destroy ships and demolish structures of the scale of the Eddystone lighthouse.

The former government agency ETSU has suggested an average energy potential of 1 MW per 30 metre wave front around the UK coasts. In March 2002, the Professional Engineer journal included an item about Ocean Power Delivery (OPD) and their plant called Pelamis, of which an example design 150 metre long would produce 750 kW ie 1 MW per 200 metre. In April 2003, there was an item in the same journal reporting a new design of plant operating horizontally (Dragon wave power converter), claiming that a device 300 metres long could generate 7 MW. This equates to 1 MW per 45-metre wave front.
Based on this third value, a 900 MW plant would require wave machines 40 km long. This makes no allowance for fixed structures or spacing to permit access and ships to pass. If it weighed 100 ton/metre, it would have a mass of four millions tons. The environmental implications of such massive structures are large. Such structures are similar in size to oil platforms joined together. Oil platforms, however, can be built in docks on dry land. These would have to be assembled or constructed out at sea. The dangers of construction, operation and maintenance are not considered when these schemes are put forward. Would they survive the worst storms? What experience is there?

Smaller plants have been tried. The 2 MW OSPREY wave plant lasted two days off the coast of Scotland before being wrecked in 1995. (This is hardly surprising, as in the 1944 Normandy invasion, one of the two Mulberry harbours weighing about 1.5 million tons was buffeted and wrecked in a summer storm in the English Channel after only 10 days use. This was the subject of a recent BBC film.

There are other ideas for using the energy in the waves. An experimental “oscillating water column” station designed at Queen’s University, Belfast, has been built on the island of Islay. Waves rise and fall in an air-filled chamber, alternately pushing and sucking air through a pipe. The pipe is connected to a dual-rotor turbine that always spins in the same direction, driving a 180 kW electricity generator. This device is the size of a small house and yet the same power could be produced by four-litre IC engine.

Wave machines have the potential to produce unprecedented local environmental damage. Their function is to extract large quantities of energy that normally arrive and are dissipated on the shoreline. By definition almost, they will affect the way the sea interacts with the coast. Many of these schemes will alter complete local ecosystems through seabed damage, silting, loss of habitats etc. Before decisions are made, extensive computer and scale modelling must be undertaken to ensure that irreparable harm is not caused to our coastline. Why are environmental pressure groups not demanding such studies?

The Severn Barrage scheme has been considered for several decades and has been considered by the PIU. It would cost £12,000 million to build but would provide 7% of UK electricity (ca 25 TWh) and last for 120 years (Ref 9). The impact of this development would be enormous and would affect up to perhaps 100 km² of the Severn estuary and catchment area. The effect on the river flow, tides, local habitats and microclimate would be unprecedented. It would in effect be the largest hydro plant in the UK and as such would face the united opposition of many environmentalists and pressure groups.

It is possible that other smaller schemes, requiring less investment and offering a shorter return on the capital could be developed. To generate at the TWh level would require a very large number of schemes and Wales is poorly provided for in this respect.

The only major tidal power scheme operating anywhere in the world is in the Rance estuary in France, where a barrage with 240 MW of turbines was completed in 1966. This produces less than 1 TWh per year. Nine such plants would be needed in the UK. Is it credible that all the suitable tidal sites apart from the Severn could be planned, designed, approved and constructed in a little over 15 years? The consequences of changing any one of these could be irreversible environmental damage to bird and fish populations.

**Summary**

Many professional engineers and scientists associated with energy supply, found this emphasis on renewables surprising, although the many risks and disadvantages of renewable systems, described in their submissions, had been given little weight in the analysis by the PIU.

Some of the engineering and scientific bodies whose studies had identified these problems are:

— The Royal Academy of Engineering;
— Institute of Energy;
— Institution of Chemical Engineers;
— Institution of Electrical Engineers;
— The Government Chief Scientist, Professors James Lovelock and Frederick Holliday.

In addition, the House of Commons Science and Technology Committee review of the low-carbon economy concluded that renewable power without nuclear was not a viable and secure option.

For 25 years, Sweden has been attempting to replace its nuclear plants, but no adequate renewable replacement has been found, so that Swedish electricity is still 45% nuclear. Barsbeck nuclear plant has been closed, but as renewables cannot replace its output, electricity is imported from coal-powered plants in Denmark, so that Swedish CO₂ emissions are increasing again. Nevertheless, the White Paper put its faith in the expansion of renewable supplies for UK electricity.

28 November 2005
Written Evidence from Wildland Network

EXECUTIVE SUMMARY

Energy developments in rural areas, particularly in the uplands, across areas of wildland, have drawn the Wildland Network into discussions on energy policy. The impact of wind turbines on the landscape and environment is in direct conflict with the values of wildland and other scenic areas. Sustainability demands that policies take full account of environmental, social and economic factors, and do not have an adverse impact on other policy areas. Energy policy cannot be considered in isolation, and costs to other parts of the economy must be taken into account in decision-making.

Wildland is a finite resource that has intrinsic value in its own right and provides society with very valuable benefits. We recommend that further study is needed to identify and where possible quantify these values. We also recommend that these values be taken into consideration in all policy affecting these areas, including energy.

The Government’s Energy White Paper has been criticised for focussing excessively on wind energy. It is evident that a more balanced and considered approach to renewable energy is required. While wind energy has a role in Wales’ energy programme, turbines should be sited where they support rather than conflict with the local economy. To this end, we recommend that wind turbines are sited only in industrial areas close to the demand for energy, and that rural areas are safeguarded against further wind developments.

The National Grid electricity distribution network also has an adverse impact on landscape, and is responsible for huge losses of energy. We recommend that energy generation is localised or “distributed”, reducing these problems and encouraging energy solutions tailored to local needs and resources.

Decisions on energy provision in Wales should rest with National Assembly for Wales, not the Department for Trade and Industry. Planning decisions on wind turbine developments should rest with local planning authorities, not the Department for Trade and Industry.

We call for a moratorium on further wind energy developments in rural areas, pending the results of further studies into the value of wildland and alternative energy strategies. We recommend that no further wind developments be permitted in the Cambrian Mountains.

WILDLAND NETWORK

1. The Wildland Network is a network of individuals and organisations. Our aims, through research, advice, encouragement and education, are: to promote the recognition and appreciation of wild land; to protect and conserve the qualities of wildness; and to promote the establishment of complete ecosystems on a large scale. We have topic discussion groups and a general news and information service via a website and email. We hold two to three meetings per year to discuss aspects of wildland, with site visits to examples of wildland projects. Examples of current areas of work that members are involved in are: mapping wildland areas in UK; assessing the value of wildland to society; assessing the potential for species reintroductions. Website at www.wildland-network.org.uk

WILDLAND

2. There is no strict definition of wildland, and it is accepted that wildland is a subjective concept associated with people’s response to certain areas of land. Qualities that are generally considered important are: large area; sense of remoteness; absence of signs of human activity; absence of infrastructure; naturalness of vegetation; presence of wild animals. Scientists at the Geography Department, University of Leeds have developed an online wilderness mapping tool which can be used to map wild areas in Britain by applying weightings to a set of factors.1

3. In the UK, many areas valued for wildland qualities may not have all of these qualities, for example spruce plantations may be present or the vegetation may be subject to unnatural levels of grazing by sheep. However, such areas are still highly valued for their sense of remoteness and lack of built infrastructure.

4. Moreover, recent changes in farm subsidies and the economics of forestry are providing huge opportunities for enhancements of the vegetation patterns in the British uplands, with consequent improvements of the landscape and biodiversity attributes of these areas.

5. Wildland does or has the potential to provide far-reaching benefits to society. The following list is not exhaustive: flood prevention and water quality improvement, carbon sequestration, tourism and recreation, wildlife, health benefits, education, fishing, hunting. Some of these can provide substantial and ongoing economic opportunities to local communities, and provide social benefits to communities over a very large catchment. Wildlands are in fact a national resource.

6. Despite these considerable benefits, wildland is being eroded. It is a finite and irreplaceable resource, that needs to be valued, protected and promoted.

1 See www.ccg.leeds.ac.uk/teaching/wilderness/
7. We urge the UK and Wales governments to make sure wildland areas are valued and protected so that society can take full advantage of the special qualities of these places and so that new opportunities for improvements are fully realised and appreciated. We recommend that a study is commissioned by government to identify and where possible to quantify the benefits of wildland. The Wildland Network can contribute some expertise in this.

**Sustainable Energy Provision**

8. Sustainability is enshrined in the constitution for Wales. We wish to draw attention to this principle in the provision of energy. The following quotes are taken from the National Assembly for Wales’ definition of Sustainable Development: “people and communities are at the heart of sustainable development”; “decisions in each field of policy take account of effects and proposals ‘in the round’, not just in the field in question”; “policies and programmes are designed in an integrated way so that they are mutually reinforcing and evidence based”; “decisions about the short term should not be contradictory to long-term aims”. It is clear that large-scale wind developments in rural areas conflict with some of the central tenets of Sustainable Development.

9. We are concerned that the wind industry has preferential access to government and is unduly influencing policy. For example a senior adviser at the Department for Trade and Industry is also a leading member of the British Wind Energy Association. This is leading to energy policy heavily biased in favour of wind, and suffocating intelligent debate on alternative approaches. Decisions on energy policy for Wales should rest with the National Assembly for Wales, not the Department for Trade and Industry. The principles of sustainable development should be applied to energy policy.

10. All rural landscapes in Wales are a fundamental part of our heritage and culture, and many are internationally important assets. People define themselves by their relationship with the landscape. Scenic landscapes, whether designated or otherwise, are as much a part of our cultural heritage as our best loved buildings. They deserve the same level of protection of their aesthetic qualities. Large-scale wind turbine developments in rural locations conflict fundamentally with the preservation of the visual qualities of the landscape and deprive us of the character and heritage of the Welsh landscape, and destroy a fundamental characteristic of wildland.

11. Currently, decisions on individual wind developments in Wales are taken by the Department for Trade and Industry. Rural developments impact profoundly on the landscape and heritage of Wales, in areas that are net exporters of energy, for the benefit of English consumers. It is politically unacceptable that these decisions are being taken in London. Planning decisions on all wind energy developments should be devolved to local planning authorities which are best placed to make decisions on the siting of developments and the value of local landscapes. These decisions should not rest with the Department for Trade and Industry.

12. The National Grid distribution network has inherent inefficiencies, resulting in the wastage of over 60% of generated power. The Parliamentary Office of Science and Technology recommends decentralising the National Grid. Localised or “distributed” generation has the potential to make massive energy savings, and to bring control and benefits of energy generation and distribution to a more local level. It also creates better opportunities for smaller scale and innovative generating systems and the use of technologies appropriate to local areas. The recent report from the House of Lords Select Committee on Economic Affairs, The Economics of Climate Change,\(^2\) quotes costs of carbon emission reducing technologies (para 81): in the long term, distributed generation is one of the cheapest options, with zero net cost over the cost of grid electricity. The National Grid also has an unacceptable adverse impact on the landscape and inherent risks for public health. We recommend that decentralised or distributed generation be adopted as part of Wales’ energy strategy.

**Climate Change and Energy Policy**

13. We call into question the current almost exclusive emphasis on wind power as an approach to tackle climate change. There is a role for wind power, but there appears to be an uninformed and unwise desperation in the rush to develop wind turbines, no matter how adverse the effects of poor siting.

14. The Kyoto Protocol concentrates almost exclusively on carbon emissions targets. The Lords Select Committee received evidence that this policy is ineffective (para 122). They heard that current targets will make little difference to rates of warming, and that it is unrealistic to expect that stronger targets will be workable. The Lords Select Committee recommends that the “beyond Kyoto” negotiations focus more on strategies of adaptation to climate change, which can be more cost effective than mitigation, and technological innovation to provide long-term solutions to our energy needs.

\(^2\) House of Lords Select Committee on Economic Affairs, The Economics of Climate Change 2005.
15. The Lords Select Committee criticises the Government’s Energy White Paper for placing undue emphasis on just one technology, wind energy, when there is a wide range of potential technologies for reducing carbon emissions (para 83). Even full implementation of onshore wind power across the UK would only diminish carbon emissions by 3%, which is negligible, and this is assuming that the wind energy displaces other energy generation, which is not the case to date, nor is it expected to be.

16. The problems of relying on wind energy are well reported. The intermittency of supply (25% capacity last year) means that there is a limit to how much wind energy can feed into the grid, which has a limited capacity to deal with the peaks and troughs of energy input. As the proportion of wind energy increases, the system is put under greater strain and the net cost of using the technology increases.

17. Other generating capacity is required to back up times of low wind. To quote from a 2005 report from E.ON Netz, a company that operates wind turbines, “Wind energy is only able to replace traditional power stations to a limited extent. Their dependence on the prevailing wind conditions means that wind power has a limited load factor even when technically available. It is not possible to guarantee its use for the continual cover of electricity consumption. Consequently, traditional power stations with capacities equal to 90% of the installed wind power capacity must be permanently online in order to guarantee power supply at all times.” The report demonstrates that the current policy expectations for wind energy in the UK are unrealistic.

18. In order to cope with the dramatic fluctuations in wind energy input, and with concentrations of wind generating facilities far from the main demand, the Grid network needs to be greatly expanded. This entails further unacceptable impacts on the landscape and public health, as well as considerable costs. We repeat our earlier recommendation, that in contrast to Grid expansion, generating capacity should be located locally to demand, and that distributed generation should replace the National Grid. Siting of generating capacity must be considered in this context.

19. According to E.ON, the “capacity credit” of wind power (the degree to which it can obviate the need for conventional power) is only 8%. Given that power stations built to back up wind power incorporate “embodied energy”, the savings in carbon emissions from use of wind power are further reduced. Added to this, no fossil fuel power stations in UK have yet been decommissioned as a result of the construction of wind turbines. Without this actual displacement of fossil fuel, wind power cannot be said to reduce carbon emissions at all.

20. The problems highlighted in the previous four paragraphs, and the experience of E.ON, show that it is very misleading to pretend that wind energy will prevent the building of nuclear capacity or reduce the need for gas and coal stations. It cannot be considered as an alternative to other generating capacity, and at best is merely a supplement. Its contribution to climate change mitigation is roughly zero.

21. Moreover, the turbines and their associated infrastructure, including the expanded Grid network, present a wholly unacceptable impact on the landscape. We provide evidence on the importance of the landscape for society above. If a key objective of government funding is to reduce carbon emissions, wind power represents a waste of scarce resources. Much greater focus is needed on alternative strategies and technologies, for example energy saving and other renewable energy technologies. We recommend that the UK and Welsh Governments review the policy of promoting wind energy. We suggest that wind turbines can provide a useful energy supplement locally in industrial areas, and that siting should be limited to industrial sites. There should be a presumption against wind turbines in rural locations.

WILDLAND AND THE RURAL ECONOMY IN WALES

22. The Welsh Assembly Government’s planning guideline TAN 8 maps a set of Strategic Search Areas targeted for massive wind power developments. An overwhelming majority of the responses to the draft consultation document were opposed in principle to the siting of wind turbines in rural areas. Despite this response, the Assembly chose to ignore the clear public opinion demonstrated by their own consultation exercise, and publish the final TAN 8 almost unchanged. Moreover, the assessment that produced the SSAs did not take landscape and biodiversity into consideration, apart from looking at designated areas, mainly National Parks. A proper strategic assessment would have started by questioning the need for the wind developments, rather than assuming the outcome beforehand. The principle and the detail of the Strategic Search Areas therefore have no political mandate.

23. One of the Strategic Search Areas, Area D Nant y Moch, is within the Cambrian Mountains Environmentally Sensitive Area (ESA). A lot of public money has been invested in the area over the last 20 years or so, to enhance the landscape and biodiversity of the area. The building of power stations across the area will destroy “goods” already paid for out of the public purse.


4 http://www.wales.gov.uk/subiplanning/content/tans/tan08/newtan8/tan8-c.htm
24. The Nant y Moch area is also the subject of a well-established project to enhance the landscape and biodiversity attributes of the area, for the benefit of the nation and to provide a quality setting for tourism and recreation activities, therefore supporting a sustainable local economy. Despite the clear conflict of interests, and representations to the TAN 8 consultation, Nant y Moch has remained a Strategic Search Area.

25. The whole of the Cambrian Mountains, including the Nant y Moch area, were identified for National Park status in 1936 and proposed in the initial list of potential national parks in 1947. The Countryside Commission presented an Order for designation 1973, which was turned down by the Secretary of State, apparently for political reasons. In making the Order, the Countryside Commission considered the landscape to be of national significance: "... cut by deep wooded valleys and gorges, their rolling moorlands are colourful at all seasons and are one of Britain’s loveliest and most attractive countrysides... attracting discerning visitors in increasing numbers who appreciate that this ‘spirit of Wales’ is the equal in beauty of many existing national parks”. There is currently a proposal to make the Cambrian Mountains an Area of Outstanding Natural Beauty.

26. Given the longstanding recognition of the obvious quality of the landscape in the Cambrian Mountains, and the interest and value it has as a national asset, we recommend that no further wind power developments be permitted in the Cambrian Mountains.

27. Wildland projects in the UK and abroad illustrate how tourism and recreation set in areas of high environmental and landscape quality bring real and lasting benefits to local economies. Wind energy developments make almost no positive contribution to local economies, and damage the qualities that are the truly valuable assets of an area. Within Wales, this is demonstrated very clearly in the Cambrian Mountains. A study of the expected socio-economic benefits of the wildland project in Nant y Moch area is anticipated early next year. Local Authorities are currently bidding for funds to invest in the economic regeneration of the Cambrian Mountains, using the enhanced landscape and biodiversity attributes of the area as a setting for the economic activities. Both of these initiatives depend entirely on preserving and enhancing the beautiful and wild landscapes in the area, and will be severely compromised, even made impossible, by further industrialisation by wind turbines.

28. A survey on visitor attitudes to areas with wind developments was conducted in Scotland, and provides some very sobering evidence for tourism in Wales. The survey asked whether respondents would go to another unspoilt part of the world instead of going to the Highlands and Islands of Scotland, should the area be subject to wind developments on a significant scale. Of 4,670 mailed, 1,643 responded. 91.4% replied yes. 2.9% replied no, but are against wind farms. 5.7% replied no.

CONCLUSIONS

29. We recommend that energy policy in Wales abandon the current focus on wind turbines sited in rural areas. We call on government to commission studies into two policy areas: evaluating the benefits of wildland; and reviewing energy provision in Wales to establish a policy based on the principles of sustainable development, with better informed, long term solutions. We call for an immediate moratorium on the building of rural wind power developments, pending the results of these studies.

29 November 2005

Written Evidence from Energy Saving Trust

1. This is the Energy Saving Trust’s submission to the Welsh Affairs Committee Inquiry into Energy in Wales announced in October 2005. This submission should not be taken as representing the views of individual Energy Saving Trust members.

2. The Energy Saving Trust was established as part of the Government’s action plan in response to the 1992 Earth Summit in Rio de Janeiro, which addressed worldwide concerns on sustainable development issues. We are the UK’s leading organisation working through partnerships towards the sustainable and efficient use of energy by households, small communities and the road transport sector, and one of the key delivery agents for the UK Government’s climate change objectives. We operate a number of programmes in Wales including Energy Efficiency Advice Centres, transport programmes, support for domestic energy efficiency activities to all 22 local authorities in Wales and a pilot renewable energy advice (REAS) through the West Wales Eco Centre. Our response, which considers each of the Inquiry’s terms of reference (ToR) in turn, focuses on our key activities and areas of expertise.

5 See Cambrian Mountains Society website for more details, www.cambrian-mountains.co.uk
ToR 1. UK Government policy in relation to

(a) the current and future energy needs of Wales; and
(b) the current and future provision of energy in Wales.

ENERGY EFFICIENCY

3. The Energy Saving Trust strongly believes that, in the short term, the priority focus in meeting Wales’ energy needs in a secure, efficient and environmentally friendly manner must be to reduce the level of demand in the first place. Demand side activity can be implemented far quicker than changes in the supply side and will deliver carbon reductions with lower levels of low carbon supply. Energy efficiency clearly helps improve security of supply by reducing the demand for primary energy and hence the level of dependency on energy imports. The installation of energy efficiency measures can result in substantial financial savings to consumers who could save as much as £250 on their annual fuel bills simply by installing energy efficiency measures. This also means that energy efficiency plays a key role in tackling fuel poverty. Energy efficiency also clearly provides the most favourable low carbon solution when taking into account embodied energy.

4. To give an idea of scale at a UK level—investment in improvements in UK households has doubled energy efficiency since 1970. These changes have reduced carbon emissions by 28 MtC per annum whilst saving consumers £10 billion every year. This is three times the saving from the whole nuclear industry and almost as much as the emissions of the UK’s fleet of coal fired power stations.

5. The Energy Saving Trust estimates that the achievable annual potential for household carbon savings in the UK is 16 MtC through existing technologies and excluding solid wall insulation. This equates to 36%7 of household energy use. One of the emerging conclusions of the joint Defra/HM Treasury Energy Efficiency Innovation Review is that “significant [energy efficiency] cost-effective savings remain in every sector, even when other hidden costs are taken into account”. 8

6. It is imperative that Wales not only continues its focus on energy efficiency as the key delivery agent for its short term carbon reductions but also raises its commitment by strengthening existing measures and introducing new policies for both now and the longer term. We would be pleased to provide details of the potential energy efficiency opportunities available in the household sector.

7. While the short term focus should be reducing demand in the first place, the longer term focus of energy policy must be a shift towards a low carbon economy. At a household level microgeneration will have an important part to play in delivering such a shift. This is considered in more detail in our response to question 3.

TRANSPORT

8. In addition to the household energy sector, rising transport emissions must be tackled as a priority in Wales. Urgent action is clearly required to negate the increasing road transport emissions that are forecast by UK Government. In our view efforts to curtail Welsh transport emissions would be helped by setting a clear target for emission reductions in the transport sector. Monitoring of progress against the target would allow the effectiveness of policy to be measured and remedial action taken if necessary.

9. However, there is considerable further scope to tackle transport emissions, key to which is the provision of information and advice to users. We would therefore welcome long term commitment to the Travel Plan Coordinator scheme and the Walking and Cycling Strategy. Local authorities in particular have very important roles in transport planning and public transport support in their local communities. We believe that greater priority needs to be given, both in local transport investment plans and transport planning, to low carbon modes of transport, in particular to public transport, cycling and walking in Wales. We offer free transport consultancy advice to Workplaces in England and Scotland as detailed on our website http://www.transportenergy.org.uk/developtravelplan/, and believe we can help reduce Welsh transport emissions by expanding this service in Wales. We would be pleased to provide further details of the potential transport opportunities that the Welsh Assembly Government could adopt.

ToR 2. The relationship between the UK Government and the National Assembly for Wales—including the division of powers—on energy policy

10. Energy policy in Wales is the responsibility of the UK Government, as are a number of other policy areas that are of direct relevance to the use and provision of energy, including:

— The promotion of renewable energy.
— Building regulations.
11. However, other policies of relevance to the use and provision of energy are the direct responsibility of the Welsh Assembly Government including:

- The promotion of energy efficiency/CHP.
- Environment policy.
- Housing.
- Planning.
- Transport.
- Local government.
- Fuel poverty.

12. This provides substantial opportunity for the Welsh Assembly Government to provide tailor-made Wales-specific solutions, which have to date included, for example, the inclusion of domestic and non-domestic energy efficiency targets for Welsh local authorities under their policy agreement with the Welsh Assembly Government. It is worthwhile noting that where such policies are particularly innovative and successful they can provide a lead for the rest of the UK to follow. For the non-devolved policy areas the Welsh Assembly Government has a key role in influencing policy outcomes at UK Government level. However, it is inevitable the result is policies that are less Wales-specific.

ToR 3 The current and future portfolio of energy provision in Wales

13. Of particular relevance to this part of the Inquiry is the Energy Saving Trust’s work on microgeneration and biofuels for transport.

MICROGENERATION

14. We believe that microgeneration offers considerable potential and must be allowed to play a major role in Welsh energy policy objectives. An appropriate policy framework should be developed accordingly.

15. Microgeneration offers a number of benefits over larger scale technologies including reduced transmission and distribution network losses, enhanced security of supply through fuel diversity and reduced dependence on a small number of generators. Renewable microgeneration technologies can also help mitigate fuel poverty in hard to treat homes, such as solid wall properties, and in off-gas network areas. Microgeneration, in common with energy efficiency, will also address heat as well as power unlike nuclear and most large scale renewable technologies.

16. Combined heat and power in general is clearly more efficient than the production of heat and power from separate sources, which is particularly relevant in relation to gas supply. We note that DTI now considers microgeneration as “the production of heat and/or electricity on a small-scale from a low carbon source”.

17. Indications are that the development of microgeneration technologies will also help improve the level of engagement with consumers on climate change issues in general. In the case of renewables, microgeneration this could help increase acceptance of larger renewable generation projects. The implementation of microgeneration solutions will also help facilitate a holistic approach to carbon reduction in the household sector by allowing the implementation of energy efficiency measures at the same time. This is clearly not possible with large scale generation solution which will not help improve engagement with consumers.

18. It is for these reasons that we advocate microgeneration must be allowed to play a major role in Welsh energy and climate change policy objectives and an appropriate policy framework should be developed accordingly.

19. The Inquiry may also be interested in the recent Energy Saving Trust discussion document “Delivering the Government’s 2020 vision for local energy generation”. This outlines our views on the major cost, information and technical constraints preventing the early deployment of a market for microgeneration (renewable and non-renewable) and the mass market transformation actions required if the UK is to meet its climate change targets. We would be pleased to provide further details of the policy framework that we believe is required to stimulate the development and mainstreaming of microgeneration solutions.

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10 Small-scale in this instance refers to homes and small commercial developments/public sector buildings.
11 Low carbon refers to either renewable energy generators or technologies with better fuel efficiency than conventional technologies.
DTI Study and Analysis of the Potential for Microgeneration in the UK

20. The Energy Saving Trust in partnership with Element Energy Ltd, Econnect Ltd and the Faculty of Economics (University of Cambridge) has recently undertaken a study and analysis of the potential for microgeneration in the UK for the DTI. We believe that the final report, which DTI is planning to release shortly will be of particular interest to the Inquiry. The report will provide the most informative and relevant information in relation to the relative costs and operating efficiencies of microgeneration technologies. We suggest that in this instance this report will be more helpful than the evidence that we could currently submit. The Committee may therefore like to request a copy of the report from DTI.

21. The analysis contained in the report is at UK level. However, the data to undertake a Wales-specific analysis does exist and providing funding was forthcoming, the analysis could readily be developed to be Wales-specific.

The Use of Biofuels

22. DfT recently announced new measures to make transport fuels greener by requiring 5% of all UK fuel sold on UK forecourts to come from a renewable source by 2010. Prior to this a study for DfT and DTI attempted to establish the UK biofuels resource potential. The analysis did not consider Wales separately. However, we believe that it would be helpful if detailed Wales-specific analysis was undertaken. The report is available at: http://www.dti.gov.uk/energy/sepn/bio4.pdf

29 November 2005

Written Evidence from David Lewis

1. INTRODUCTION

I am a retired civil servant and have made a general study of energy in the last two years. Much of the following detail is in broad agreement with the conclusions of the Sixth Report by the Commons Select Committee on Public Accounts which does seem to cover a fair amount of common ground. One vital conclusion reached was that a carbon tax would be a much fairer and simpler system than the existing regime of Renewable Obligation Certificates which distort the economic factors of energy production.

2. PRIORITIES

— The Committee is primarily concerned with cost, cleanliness, efficiency and sustainability of energy supplies.
— It is submitted that the most important of these is sustainability, which is assumed to infer security of electricity and gas supplies. The worst case scenario is that the National Grid will be unable to cope with demand and cause blackouts and/or the gas supply fails.
— This inability to cope is most likely to result from lack of fuel and/or failure of unreliable power station machinery. The existing reliability factor appears to be satisfactory.
— The recent progressive rises in natural gas prices is now cause for concern, coupled with the growing dependence on imported gas from areas which might become politically unstable.

3. RENEWABLE ENERGY

— This appears to be diversion from the main concern and needs to be addressed before it aggravates the very problems it is meant to solve.
— The setting of targets of so-called renewable energy targets stems from the Kyoto Treaty which is now severely discredited in its efforts to reduce carbon emissions which are believed to cause Global Warming and climate change. It is due to expire in 2012.
— The targets were regarded as a simplistic method of measuring carbon reductions but there is ample evidence from the practical experience of Denmark and Germany that their prolific investment in wind turbines has not reduced their emissions because full back up is required from conventional sources at all times to avoid power failure.
— Continental Utility Companies are clear about the futility of wind power. Eon Netz, one of Germany’s grid managers, with over 7,000 MW of wind capacity connected, has described in their annual wind reports that they need additional conventional capacity to cover 100% of the possible infeed from wind, because even as it peaks it often drops off very quickly. Many utilities in Japan cap the amount of energy they will accept from wind facilities. A recent report boasting of the UKs superb wind resource also points out that new “spinning reserve” must be built and kept burning to compensate for wind power’s fluctuations, thus severely limiting any positive effect on the use
of other energy sources. A February 2004 study by the Irish grid found that wind power caused minimal displacement of other sources, that it was essentially superfluous additional capacity. Eon Netz projects that at best wind turbines might displace barely 4% of their capacity in other sources.

— “In green terms windmills are a mistake and economically they make no sense,” says Niels Gram of the Danish Federation of Industries. “Many of us thought wind was the 100% solution for the future but we were wrong. In fact, taking all energy needs into account, it’s only a 3% solution.”

— Danish experts admit that wind power has not worked out very well.

— “In just a few years we’ve gone from some of the cheapest electricity in Europe to some of the most costly,” says Jytte Kaad Jensen, chief economist for Eltra, Denmark’s biggest electricity distributor.

— Aase Madsen, an MP who chairs energy policy in the Danish parliament, is emphatic: “For our industry it has been a terribly expensive disaster.”

4. **WIND POWER CONCLUSIONS**

— It is clear that wind power is not capable of meeting our energy needs and is having no practical effect on climate change.

— It is heavily subsidised by Capital Grants, Renewable Obligation Certificates and Climate Change Levies which are hidden in the increase in cost to electricity consumers.

— It cannot compete on a level playing field with conventional power supplies, with the result that up to 70% of earnings by wind turbine operators is from ROCs and other subsidies.

— There is very limited reliability of supply and the adverse visual effect on the environment has now become obvious with growing public opposition.

— If the underlying reason to build wind turbines is to lessen global warming it has failed in every respect to prove that the policy has been successful in this aim.

— The reluctance of Government to recognise and react to the above facts is likely to stem from inertia in that the initial policy had the hallmarks of a “political winner” and there would be a loss of face if a change of direction was adopted.

— The wind policy is therefore, costly, unreliable and inefficient.

5. **THE NATIONAL ASSEMBLY FOR WALES**

— Efforts to convey these points to the Government and Members of the Assembly have mainly been met with repetitive mantras on their blind obedience to meet renewable energy targets. Democratic debate has often been stifled.

— The main instance of this is the case of the Scarweather Sands Wind Farm which is summarised below. The challenge to debate this matter in the Welsh Assembly was heavily defeated on 5 October 2004, to the dismay of the general public whose perception that the WA Government was reluctant to face up to these compelling facts. The Scarweather Sands Order was therefore issued by publication in *The London Gazette* dated 2 November 2004.

**SCARWEATHER FACT SHEET**

Background to the Planning Decision Committee’s Approval of the Proposed windfarm on Scarweather Sands:

January 2003. United Utilities put forward an approximately 1,000-page Environmental Assessment of the proposal.

Summer 2003. Then Environment Secretary, Sue Essex AM, calls for a Public Inquiry to be held.

A Public Inquiry sits from 4 November 2003 to 27 November 2003. This was the longest inquiry into a windfarm ever held in Wales, with thousands of pages of evidence considered.

30 March 2004. 177 page Inspector’s Report produced. In his report the Inspector concluded:

“The visual impact of a windfarm in the specific location of this proposal would be so prominent when viewed from Porthcawl and its immediate area that I consider that the harmful effects on this view are sufficient to outweigh the benefits of this particular proposal. I recommend that the Order is not made and the Direction that planning permission is deemed to be granted is not given.”

(paras 128–129. p 22.)
15 April 2004 The Planning Division of the Welsh Assembly Government (WAG) requested “a more detailed explanation of the issues associated with the impact of the proposal on visual amenity.”

14 May 2004 The Inspector produced a 14 page Addendum Report in which he stated;

“. . . I reiterate my overall conclusion that the environmental and economic benefits of this proposal do not outweigh the real and significant harm to the visual quality of Porthcawl and the surrounding area that would result from this particular proposal on this particular site.” (para 65, p 13.)

6 July 2004 The Planning Decision Committee (PDC) of the National Assembly for Wales reported its findings on the Inspector’s Report. It concluded, after a meeting which lasted only a few hours:

“. . . the Committee accepts the Inspector’s consideration of the issues but disagrees with his overall conclusion and with his recommendation.”

The PDC accepts that “. . . the windfarm will have a visual effect on public amenity in the area . . .” but adds that the effect on this . . . and the local tourism industry identified by the Inspector will be outweighed by the significant benefits . . . in terms of the production of renewable energy.” (para 11.)

The PDC gave no reasons for its conclusions. It simply disagrees despite the recommendation by the Chief Planning Officer of the WA that the Public Inquiry Inspector’s Decision should be upheld by the PDC

My Reaction and Comments Relating to this Matter are as follows:

It should be noted that the load factor of these 30 turbines, taken from average recorded output of similar developments, is likely to be around 23% of the installed capacity of 108MW, giving an output of 25MW. This represents a small proportion, under 2%, of the output of 1,500 MW from neighbouring Aberthaw coal fired Power Station which will still be required for back up at all times. To call this “significant” is really stretching the true definition of that word to the point of travesty . . . no practical effect on climate change but all down to target chasing. Another way of putting it is that we would need 1,800 offshore wind turbines, occupying 240 square miles, to match the output from Aberthaw . . . but we would still need Aberthaw for back up.

If Scarweather would cost around £150 million, possibly more now that the Danish Manufacturers have increased turbine prices by 70%, the projected cost for 1,800 turbines would be £9 billion. It is clear that this would not be economically viable without huge subsidies from Capital Grants and ROCs . . . a ludicrous prospect.

— This case illustrates the need for an urgent change of policy in the provision of reliable and economically viable energy production in Wales and for the whole of the UK.
— An immediate moratorium should be imposed on wind farm developments pending the outcome of this inquiry.
— The Welsh Assembly should be asked to explain the reasoning of the Planning Decision Committee in the Scarweather Case.

6. THE NUCLEAR OPTION AND THE WAY AHEAD

— It is now recognised by the UK Government that this is the best solution to provide an efficient, economic and reliable source of carbon free power. France and Sweden have successfully changed the attitude of their citizens. France obtains 75% of their electricity from nuclear sources, probably envied by Germany and Denmark who now regret their decision to phase out their nuclear facilities. Sweden have 10 reactors providing half their electricity and 80% of their population favour nuclear energy.
— The closure of Wylfa Nuclear Power Station in North Wales will cause serious problems unless it is replaced with a new nuclear unit of the latest efficient design.
— The storage of nuclear waste is recognised as global problem and it is feasible for all industrial Nations to cooperate in building a safe and remote facility for this purpose.
— New technology designed to clean up emissions from coal fired power stations should be developed and introduced when available. A carbon tax would provide an incentive but should still allow coal to remain profitable as a fuel.
— The other renewable options of tidal and hydro-electric really do need to be explored and given proper funding to provide a more reliable and predictable source of green energy.

Finally I wish the Committee well in this difficult task and trust that they will meet the challenge head on.

30 November 2005
Summary

1. It is critical that the planning and delivery of energy policy in Wales fully reflects the National Assembly for Wales’s Scheme for Sustainable Development and the Welsh Assembly Government’s Spatial Plan.
2. CCW supports the UK Government’s long-term aim of a 60% reduction in CO₂ emissions by 2050. This should be the major driver of energy policy.
3. Achieving the RCEP’s 60% CO₂ reduction target demands a twin track approach:
   — far greater emphasis on demand-side management and on energy efficiency; and
   — the development and utilisation of RE technologies.
4. The key to the development of RE is to ensure “the right technology in the right place”. This requires a strategic approach to the planning and siting of new RE developments, on land and at sea, including the Strategic Environmental Appraisal of different options. This would allow consideration of potential cumulative impacts of new technologies.
5. For onshore wind, the TAN 8 approach has our strong support. We would advocate the equivalent of a TAN 8 for the sea and CCW would be keen to input positively to this.
6. In the context of ongoing power generation development proposals at Aberthaw and Pembroke, the applications and their timing allow an excellent opportunity to encourage an integrated assessment of the proposals in terms of their wider strategic consideration under the sustainable development duty of the Welsh Assembly Government. We would strongly advocate such an approach.

Introduction

1. The Countryside Council for Wales champions the environment and landscapes of Wales and its coastal waters as sources of natural and cultural riches, as a foundation for economic and social activity, and as a place for leisure and learning opportunities. We aim to make the environment a valued part of everyone’s life in Wales.
2. Our comments below are structured according to the Terms of Reference of this inquiry.

UK Government policy in relation to: (a) the current and future energy needs of Wales; and (b) the current and future provision of energy in Wales

3. It is critical that the planning and delivery of energy policy in Wales fully reflects the following high-level strategies:
   — The National Assembly for Wales’ Scheme for Sustainable Development and the Welsh Assembly Government’s Sustainable Development Action Plan;
   — The Welsh Assembly Government’s Spatial Plan, People, Places, Futures. We recommend that this should be extended to cover the marine environment.
   — The Welsh Assembly Government’s emerging environmental strategy.
   — The Welsh Assembly Government’s strategic framework for economic development.
4. The Royal Commission for Environmental Pollution recommended that UK CO₂ emissions should be reduced by 60% from current levels by 2050, and this target was embedded in the Government’s Energy White Paper Our energy future: creating a low carbon economy. CCW supports this long-term aim which, by implication, should be the major driver of policy.
5. We consider that it is important to address both the supply and the demand aspects of energy matters. The overriding issue is one of mitigating the impact of climate change and clearly measures that support a reduced level of demand for energy are as important as measures which promote low-carbon technologies. Achieving the RCEP’s target thus demands a twin track approach:
   — far greater emphasis on demand-side management and on energy efficiency; and
   — the development and utilisation of RE technologies.
6. The greater the reduction in demand for electricity through demand-side management and energy efficiency, the more achievable will be the UK’s and Wales’s renewable energy generation targets. More emphasis is required on using tools to manage energy demand, such as
   — improvements to Building Regulations, benchmarking and adopting European best practice;
   — fiscal tools to further incentivise take-up of low energy and energy conservation products and services; and
   — life cycle costing and total energy use—for example to increase the case for constructing to “excellent” BREAM standards.
7. Early consideration could be given to creating a stronger sustainable energy R&D base in Wales. In this way Wales can demonstrate exemplar sustainable development projects consistent with a “win-win” policy scenario. It is important that R&D in developing new sources of RE is accelerated now to enable a wider range of RE options to come on-line sooner rather than later. There should be a key role for the Sustainable Technologies Technium at Baglan Energy Park.

8. We support the principle of local generation, and micro generation, that occurs close to the point of demand. The benefit of local generation is that it avoids the transmission losses associated with the National Grid, and also offers the potential for ownership at community level by local communities, the voluntary sector and other and social enterprise organisations. We consider that it would be useful to undertake a full evaluation of the economic, social and environmental costs and benefits of taking forward local generation in Wales. The role of generating energy from waste (where this is consistent with the Wales waste hierarchy) should be considered as part of this approach.

9. There needs to be better links to UK Government strategies, particularly in marine renewables. There are ongoing discussions with the UK Government in relation to section 36 and 37 of the Electricity Act. Overall, particularly in the marine environment, WAG is currently not the consenting body. Strategic planning for offshore energy therefore needs to positively encompass DTI working in partnership with WAG and its partners.

10. The WAG has recently consulted on its Energy Route Map. This confirms the WAG’s target of achieving 4TWhr pa of RE production by 2010 and 7TWhr by 2020. CCW supports these targets and will be working actively with WAG, other regulatory authorities and developers help achieve them. The key is to ensure “the right technology in the right place”, and this requires a strategic approach to the planning and siting of new RE developments, on land and at sea, as evidenced by the TAN 8 approach which has our strong support. We hope that the Route Map will promote and achieve such an approach, in partnership with all key players involved. We look forward to contributing positively to its achievement. In some cases this may involve early (and, if necessary, in confidence) consultation with CCW by developers, and we would encourage any such approaches.

(a) Nuclear Energy

11. It is essential that Wales and the UK develop a diverse mix of energy sources and electricity generation capacity with every sector seeking to maximise efficiency and minimise GHG emissions. We cannot seek to rely on gas-turbine generation or wind-turbine generation or renewables alone. Energy efficiency has an important role to play but can only be part of our response. The UK Government’s Energy White paper kept open the option of future nuclear generation capacity without committing itself to any new nuclear build. By 2023, all of the UK’s nuclear plants except Sizewell B will have been decommissioned. Currently, nuclear provides c 20% of UK electricity (without any direct GHG emissions), including the contribution of Wylfa in Wales. Unless new carbon-neutral generating base-load capacity is developed then any reductions in carbon emissions achieved by reaching the 20% renewables by 2020 target will be outweighed by the almost total loss of nuclear. We would urge the Government to speedily resolve this issue.

12. It has long been assumed that by protecting the health of people, the health of other wildlife species is also protected from the effects of radiation. The EC through its 6th framework programme ERICA (Environmental Risk from Ionising Contaminants: Assessment and management) is evaluating the impacts of ionising radiation on wildlife. The work is due to be finished in 2007 and the results should be built into any consideration of nuclear options.

(b) Liquefied Natural Gas

13. We have been involved in consultations with National Grid Transco (NGT) concerning the route for the pipeline to transport LNG from Felindre to Tirley in Gloucestershire. There has been a very constructive dialogue between NGT, CCW and other statutory bodies whilst NGT undertook a re-appraisal of corridor options for this pipeline. This has required a very large input of effort by NGT and CCW. We very much welcome the scale of effort in this early engagement which has lead NGT now to favour a corridor that is largely located within lowland agriculturally improved land where in our view the residual impacts are likely to be in much lower order of magnitude.

1 This is sometimes referred to as decentralised energy (DE) systems.
14. Concerning the above process we would note that our understanding is that once gas shippers have signalled their capacity requirements via the Ofgem regulated auction process, NGT are obliged to provide a connection and any reinforcements necessary to the National Transmission System (NTS) within three years of the auction signal. It is this three year Ofgem requirement that has determined the timescale for this project. We have highlighted our concerns to NGT and the DTI that three years is an inadequate period to design and implement a scheme of this scale within such a sensitive area. Whilst we recognise the high level of effort that NGT are making to find an acceptable solution, we remain concerned about the pressure that the Ofgem rule places on this project’s timescale and minimising impacts on the environment.

15. Additionally, we have concerns regarding the proposal to construct and operate a 2,000MW CCGT power station at West Pennar, Pembroke. These relate to:

- Thermal emissions and direct/indirect impact on habitats and species.
- Habitat loss/modification.
- Ingress and entrainment of species.
- Water quality issues.
- Air Quality issues.
- In-combination effects and cumulative impacts.
- Lack of consideration of mitigation and alternative solutions.

16. Nevertheless, that the development of the Pembroke proposal offers highly significant environmental benefits compared with the proposal to expand Aberthaw (which we comment on below).

17. We note that, as separate planning applications the two power station developments (Aberthaw and Pembroke) are being considered individually by the planning and pollution regulators. The applications and their timing allow an excellent opportunity to not only examine the site specific implications of the separate development proposals but to encourage an integrated assessment of the proposals in terms of their wider strategic consideration under the sustainable development duty of the Welsh Assembly Government. We would strongly advocate such an approach.

(c) Clean Coal Technology

18. We support the WAG’s objective (stated in its Energy Route Map consultation) to establish Wales as an attractive location for a Coal/carbon capture and storage initiatives. It is inevitable that there will be continued reliance on fossil fuel electricity generation capacity well into the 21st century (within UK and elsewhere) therefore research and the development of CCS technology within Wales could in the long-term provide major economic and environmental benefits. The sooner the technology and feasibility of this is explored and developed the better.

19. We look forward to contributing positively to the Coal TAN Technical Advice Group.

20. We have concerns relating to the proposed partial upgrading and increased generation of electricity at Aberthaw Power Station. Despite a proposed investment to fit FGD at Aberthaw, the increase in electricity production will significantly increase other pollutants:

- Without the installation of NOx removal, Aberthaw will represent the second largest point source of NOx in Europe, which at full load could release approximately 41,000 tonnes of NOx per annum. Aberthaw is situated at a particular inappropriate location in relation to the impacts caused by such a large emission source. CCW advocates additional control measures to remove the oxides of nitrogen (NOx).
- Increased generation at Aberthaw represents a major new source of CO2 emissions, emitting approximately 10 million tonnes per annum at maximum output.

(d) Wind Farms

Onshore wind

21. CCW welcomes, and has long advocated, the overall policy approach set out in the Ministerial Interim Planning Policy Statement and TAN 8 in particular the use of a strategic all Wales spatial approach to finding suitable locations together with an increased emphasis on energy efficiency and conservation. The strategic spatial approach potentially provides a framework to facilitate positive planning to address climate change identifying positive solutions, the right type of development in the most appropriate locations, thereby helping secure government targets whilst minimising environmental cost.

22. CCW is concerned to ensure that the TAN 8 implementation process provides clarity and certainty for all involved in the development process, supported by a decision support tool developed to help inform the decision making process within the planning system. Without a proactive approach within the Strategic Search Areas, CCW is concerned that the strategic approach will stall.
**Offshore wind**

23. CCW have attempted to be proactive in the marine renewable field and take a precautionary but pragmatic approach. We have worked closely with the Welsh Assembly Government (WAG), Defra, Cefas, Crown Estate and many other bodies. We have encouraged developers to involve us early in the planning process, recognising that early dialogue is invaluable in reducing conflict.

24. Through CCW’s technical support program we have commissioned new research to promote a better understanding of offshore wind farm impacts and ensure that our advice is based on up-to-date information and robust science. We have also provided tools to help developers tackle landscape issues in their EIA’s in our seascapes guide. Often developers need to collect data for a wider area than their site and CCW have taken a proactive role in bringing developers together and coordinating large-scale bird surveys. In addition the interest on deposits paid to the Crown Estate by developers has been used to fund research on impacts and CCW have participated fully in this.

25. The UK’s first major offshore wind farm, North Hoyle, is in Wales, off the north Wales coast. It is now consented, constructed and generating. We supported the application for this development, and have forged a good working relationship with npower who developed the site.

26. The original application for the other round one site off the north Wales coast, Rhyl Flats, proposed an unusual design of two long lines of turbines. Our main concerns, on landscape grounds (spread across the horizon), and ornithological issues (potential barrier effect) were, in part, resolved by working with the developers and a more compact design being proposed. This development was then consented.

27. We consider that increased collaboration between ourselves, Crown Estates, DTI, WAG and developers would facilitate the achievement of offshore wind development in Wales.

28. We also suggest that issues of public awareness and education are considered. The strength of public feeling seen at the Scarweather Sands offshore wind farm proposals, if repeated, have the potential to cause problems for future offshore wind farm development in Wales. We need to address public engagement actively in regard to offshore wind development.

(e) Biomass Energy

29. Biomass energy can be drawn from a range of sources including wood (from existing woodlands and plantations), short rotation coppice, energy crops and waste (timber co-products, waste wood, animal manures/slurries, sewage sludge and food waste). Biomass energy has the benefit of being continuous, and is most efficient when the source is close to the end use, to reduce transport impacts. The recent report by the Biomass Task Force (October 2005) to Defra was produced in an England context, but much of the information it contains is applicable to Wales.

30. Biomass from plant sources, whether existing (woodlands and plantations) or newly established short rotation coppice or energy crops must comply with best practice to ensure that there are no negative environmental impacts. Further work is needed to expand the suite of best environmental practice guides (for example, for Miscanthus and other energy crops).

31. Biomass-fuelled heat is deemed to be more efficient than biomass-fuelled electricity production, though combined heat and power generation is efficient. In Wales, the best solution seems to be to concentrate on smaller scale installations, such as schools or institutions, and small scale local heating/energy generation. Examples of these already exist, and can act as exemplars to encourage others to adopt these systems, and to refine them both technologically and administratively. Coed Cymru has developed a small scale wood pelleting process which supports the development of such initiatives, allowing pellets to be produced locally.

32. We support the use of biomass for energy and hope to contribute to the forthcoming Biomass Energy Strategy for Wales.2 Evidence in the Biomass Task Force report suggests that biomass-fired heat has an 80% energy extraction efficiency and the technology is available; lack of confidence appears to be a major barrier to uptake. In Wales, the Centre for Alternative Land Use is researching and promoting biomass energy, and the Forestry Commission has secured funding from Objective 1 and 2 for the Wood Energy Business Scheme. Opportunities for capital grants for equipment (boilers or anaerobic digesters and associated infrastructure) for community, farm scale and domestic use should be pursued. Such grant aid could be targeted geographically (this is an issue which the forthcoming WAG biomass energy strategy should address). The Biomass Task Force point to the need for such policies to be in place for the medium term, (5–7 years) to build confidence and to achieve a significant impact.

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(f) Geo-thermal Energy

33. No comments.

(g) Tidal and Wave Energy

34. The development of the marine renewables sector in Welsh waters requires a process of strategic planning to give an indication of the most appropriate technologies and potentially suitable locations. Criteria which take into account potential nature conservation and landscape impacts and sensitive areas around the Welsh coast should be included. Adopting a Wales wide strategic approach would allow adequate consideration of potential cumulative impacts of these technologies.

35. DTI has recently launched its consenting policy for wave and tidal renewable energy projects. CCW and the other Country Agencies were consulted in its development. We welcome DTI’s approach to setting out a fair process which will allow developers to progress demonstration projects whilst recognising that there are environmental constraints and certain measures which must be taken in order to avoid significant impacts on the marine environment. However, in our view the guidance would be stronger if it contained guidance recognising environmental issues and constraints concerning site choice, duration and scale of demonstration projects. It is important that we learn as much as possible from this pre-commercial phase to contribute significantly to any Strategic Environmental Assessment conducted before any commercial deployment of these devices.

36. There are many unknowns about the potential impacts of these technologies. A precautionary approach to their siting should be taken. We recommend some form of marine spatial planning exercise be undertaken at an appropriate scale to plan for both offshore wind and wave and tidal whilst taking full account of the needs of other sectoral objectives, including nature conservation. Whilst marine spatial planning should enable strategic decision making in the marine environment it is critical that any planning exercise takes full account of terrestrial considerations as well (and visa versa). This could improve integration between planning for the management of the terrestrial and marine environment and thus contributing to Integrated Coastal Zone Management and more joined up thinking. From a Welsh renewables perspective the outcome of this could be in the form of the equivalent of a TAN 8 for the sea and CCW would be keen to input positively to this.

37. A critical role can be played by pre-commercial demonstration projects in enabling us (and others) to understand about impacts. We will work with WAG to support their objective (stated in it’s Energy Route Map consultation) to “try to ensure that major demonstration projects are located in Wales by 2010”. We have already been approached by a number of developers looking to deploy pre-commercial demonstration devices in Welsh waters and we are engaging in early dialogue about site selection with them.

38. CCW has already undertaken some work, which could be used as a starting point to help achieve the development of marine renewables in Wales. This work looked at which sites are potentially the most likely to attract certain types of renewable development and then identified which habitats and species are present at the specific sites, so that we could look at potential impacts and provide advice to developers very early in the development planning. We have already been engaged in dialogue with developers considering Welsh territorial waters for the deployment of their pre-commercial demonstration devices and will continue to talk to these and others.

39. There are many uncertainties about the environmental impacts of wave and tidal technologies, which may take some time to address and this must be reflected in the adoption of a precautionary approach at sites where data gaps are identified or impacts are unknown.

40. We suggest that WAG (and others) need to work with DTI and Crown Estate to ensure there is an appropriate consenting policy in place to enable the development of marine renewables in Wales.

Tidal energy

41. The Government’s Energy White Paper states that “it is clear that plans for a Severn Barrage would raise strong environmental concerns and we doubt if it would be fruitful to pursue it at this stage” (para 5.54). We were therefore surprised to see that major demonstration projects are located in Wales by 2010”. Our advice would be that this option should not be kept open due to the concerns about the impact of this option on the natural environment.

42. The Severn Estuary has been designated as a Site of Special Scientific Interest (SSSI), Special Protection Area, and a Wetland of International Importance (Ramsar). Furthermore the UK nature conservation agencies and JNCC have recommended to Government that the area be put forward as a Special Area of Conservation (SAC). At present the Estuary has possible SAC status. The estuary is important because of its extreme conditions, and the habitats and species present in the estuary are a function of this dynamic physical environment. It is inevitable that features of European and UK importance would be damaged and/or lost if a scheme like the barrage were to go ahead.

43. Work in 2002 on the Severn Barrage\(^a\) notes that “within the basin formed by the barrage the hyper-
 tidal nature of the estuary would alter significantly and no measures to compensate for the loss of this 
particular feature could be engineered”. This is a critical issue. Under the Habitats Directive it would be 
necessary to compensate for such losses, a requirement further clarified by the recent Dibden Bay decision. 
We doubt that the coherence of Natura 2000 could be secured if such a scheme were to go ahead.

(h) Hydro Electric Energy

44. We support the development of small-scale hydro subject to appropriate location. We would cite as 
good practice the development of a small-scale hydro electric turbine at Talybont-on-Usk, following a 
feasibility study funded by the National Assembly for Wales’ Sustainable Development Fund. The turbine 
will produce an annual energy output in the region of 240 Mwh valued at around £17,000. The electricity 
generated will be sold under the Renewables Obligation to a Public Electricity Supplier via the National 
Grid. Talybont-on-Usk Energy (a limited company with charitable objects) will re-invest the proceeds from 
the sale of the electricity in a range of further energy projects in the Talybont-on-Usk community council 
area. All this will be managed by and for local people, and has the potential to be a model for small-scale 
renewable energy generation.

9 December 2005

Written Evidence from Mynydd Llansadwrn Action Group

WIND FARMS

STATEMENT

The Mynydd Llansadwrn Action Group accepts the need for an energy policy that focuses on emission 
reduction, but as the contents of this submission show, wind power is not a useful technology for achieving 
these policy objectives.

SUMMARY AND CONCLUSION

Researched evidence proves that wind power is an unreliable and intermittent source of energy that 
cannot provide firm predictable generating capacity; it is extremely expensive compared to almost every 
other energy source; and, it has limited value in reducing carbon dioxide emissions because of the need for 
spinning reserve backup from fossil-fuelled power plants. Wind farms are deeply unpopular with a growing 
number of people who object to the visual intrusion, the noise and light pollution and the damage to the 
environment and wildlife.

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Building a wind farm with all its associated works and grid connections is a major construction project that inevitably causes environmental damage.

6. **Noise pollution**

The low-frequency noise and vibrations from wind turbines can be very disturbing for some people and have serious health implications.

7. **Light pollution**

Strobe effect and shadow flicker caused by wind turbines and pulsating lights that are sometimes installed on the turbines themselves are sources of light pollution.

8. **Threat to wildlife and livestock**

Wind farm construction is a threat to wildlife. Once operational, wind turbines kill birds and bats. Noise and light flicker from turbines can disturb livestock.

9. **Jobs and tourism**

Wind farms threaten the local tourist industry and create few, if any, jobs.

10. **Property values**

Wind farms have been shown to reduce the value of nearby properties.

11. **The economics of wind power**

Wind power is one of the most expensive forms of electricity; it survives on direct and indirect subsidies. This extra cost to taxpayers is not good value because wind energy cannot provide firm generating capacity nor can it make a significant contribution in reducing greenhouse gas emissions.

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1. **Energy Output from Wind Turbines**

*The energy output from wind turbines is lower than estimates given by the British Wind Energy Association and wind-power developers. These exaggerated claims are generally accepted by decision-makers.*

1.1 Capacity Factor

Energy output from wind varies from zero to 87% of their rated capacity, depending on the wind. If the wind speed is less than about 5 metres per second (11 mph), no electricity is generated; if the wind speed is greater than about 25 metres per second (56 mph), turbines are shut down for safety reasons. According to the DTI, the average load, or capacity, factor for onshore wind turbines in the UK in 2003 was 24.1%. Ofgem estimated an average load factor of 23% for Wales during 2003. The capacity factor for wind energy is low compared to other power plants.

1.2 Exaggerated Output Estimates

British Wind Energy Association (BWEA), the lobbying body for wind-power developers, claims that wind turbines have a load factor of 30% of their rated or installed capacity. This figure is generally used by wind-power developer to calculate emission savings and the number of houses to be supplied. The consequence is an exaggerated picture of what a wind farm can realistically achieve. In the case of the Blaengwen wind farm application in Carmarthenshire, the developers’ exaggerated figures on emission savings and number of houses to be supplied were cited in the planners’ final report as justification for recommending approval, despite the fact that the application contravened the local development plan. It should also be pointed out that our group and others had challenged the developers’ figures but our comments were not acknowledged in the planners’ report.

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2. **Fluctuations in Generating Capacity**

Wind-generated electricity is intermittent and unpredictable and, therefore, requires spinning reserve backup. Fluctuating energy supplies from wind turbines cause problems for grid operators, who have to stabilise supply with demand.

2.1 **Spinning Reserve**

Demand for electricity is fluctuating but generally predictable, whereas the supply of electricity from wind farms is fluctuating but unpredictable. Difficulties arise for grid operators when they are forced under the current political regime to purchase wind-generated electricity and introduce this fluctuating and highly unpredictable supply into the grid system. In order to stabilise supply and demand, grid operators must maintain continuous spinning reserve backup ready to take over when the wind does not blow or blows too hard. All power plants need a certain amount of backup to cover down times, but wind power is unique in that the down times are intermittent and unpredictable, so the backup for wind power must be running continuously, ready to go on stream immediately in response to changing weather conditions. The crucial point here is that the spinning reserve is burning fossil fuels and emitting CO₂ even when not producing electricity.

2.2 **Spinning Reserve in Denmark and Germany**

The more wind energy penetrates the grid system, the more spinning reserve becomes crucial in meeting electricity demand. “The 2003 West Danish Grid [ELTRA] System Report . . . identified Spinning Reserve capacity as between 300MW and 500MW per 1000MW of installed capacity which means that with a Danish load factor of about 20%, ‘backup’ can be of greater capacity than realised generation.” The German power company E.ON Netz in its Wind Report states: “The characteristics of wind make it necessary for these ‘shadow power stations’ to be available to the extent sufficient to cover over 80% of the installed wind capacity.”

2.3 **Unusable Wind-generated Electricity**

Evidence from Denmark shows that even a large wind farm system is incapable of providing firm predictable generating capacity. Sometimes output is low when demand is high; sometimes output is high when demand is low. As a result, Denmark exports most of its wind-generated power to its neighbours at a financial loss. Denmark is able to export its unusable electricity because it has grid connections with other countries. The UK has no such links, which means we cannot sell our unusable wind-generated electricity even at a loss. It is wasted.

2.4 **Grid Instability**

Government policy is to increase the energy generated by renewable technologies, mainly wind power. However, the more wind penetrates the grid system the more problems there are to stabilise supply and demand. Hugh Sharman, in a recent article in the Civil Engineering magazine, has warned of the problems that can arise with wind-generated electricity. He concludes:

The Government is advised that the UK’s system can accept anything up to 26 GW of wind power . . . this advice cannot be regarded as sound. Ample evidence from relatively large wind systems in Denmark and Germany exists to prove that 10 GW (+/−25%) will be the probable safe upper limit of all wind capacity. Wind power’s contribution at 10 GW, albeit small and costly, can be significant. However, its construction will do nothing to offset the inevitable loss of firm generating capacity. According to the E.ON Netz Wind Report² the increase in wind power, because of its intermittent nature, has threatened the stability of Germany’s electricity supply.

3. **Wind Turbines and CO₂ Emissions**

Estimates of the contribution of wind power to a reduction in CO₂ emissions are generally exaggerated

3.1 **Exaggerated Claims**

The BWEA assumes that wind will replace coal-fired capacity unit for unit and bases its calculation for emission savings on this assumption. The BWEA figures are used to support developers’ claims in their planning applications for wind farms. The developers of the Blaengwen wind farm claim a carbon dioxide offset figure of 0.85 tonnes per MWh, based on the assumption that “. . . the electricity generated by wind turbines effectively replaces the output of coal-fired power stations, unit for unit.”
3.2 Government Estimates

When wind-generated electricity is introduced into the grid system, it cannot be said with any certainty which type of electricity source it is replacing. It could be replacing coal, gas, or even an emission-free source such as hydroelectricity or nuclear power. According to DTI’s Wind Energy Fact Sheet, “The UK electricity market is extremely complex . . . and it is not possible to make categorical statements on how wind changes the generation mix.” Therefore, it is more accurate to use a “grid average” to reflect the uncertainty as to the type of power, ie coal, gas, nuclear, etc, that is displaced when wind power supplies energy to the national system. Both the DTI and the Carbon Trust use a “grid average” figure of 43 million tonnes of carbon dioxide emissions per year when calculating potential emissions savings. This factor of 0.43 tonnes per MWh is about half that claimed by the BWEA and wind farm developers. After 2010, the DTI expects that the generation mix will have changed and that wind power will be operating in conjunction with Combined Cycle Gas Turbines (CCGT). Therefore, post 2010, emissions savings from wind turbines should reflect CCGT displacement, which at 0.27 millions tonnes per MWh is even less than the emission savings figures currently accepted by the DTI and the Carbon Trust.

3.3 CO2 Emissions from Spinning Reserve

The estimated emission savings from wind turbines must be balanced against the emissions from the fossil-fuelled spinning reserve required to balance supply and demand when wind power is brought into the grid system.

[Reserve] capacity is placed under particular strains when working in this supporting role because it is being used to balance a reasonably predictable but fluctuating demand with a variable and largely unpredictable output from wind turbines. Consequently, operating fossil capacity in this mode generates more CO2 per kWh generated than if operating normally . . . Thus the CO2 saving from the use of wind in the UK is probably much less than assumed by Government advisors, who correctly believe that wind could displace some capacity and save some CO2 , but have not acknowledged the emissions impact of matching both demand and wind output simultaneously. As a result, current policy appears to have been framed as if CO2 emissions savings are guaranteed by the introduction of wind-power, and that wind power has not concomitant difficulties or costs. This is not the case.7

The amount of CO2 emissions a wind turbine can save is a matter of conjecture since there are no mechanisms in place to take accurate measurements. However, Denmark, the country with the most wind-generated electricity per capita, has shown no reduction in its overall CO2 emissions; in fact, Denmark’s CO2 emissions are rising.8

4. WIND TURBINES AND GLOBAL WARMING

Wind turbines will have no significant effect on global warming trends

4.1 Wind Farm Construction and Global Warming

Wind turbines are being promoted by both the UK Government and Welsh Assembly as an effective strategy to reduce greenhouse gas emissions and thereby counteract global warming trends. Electricity generated by wind turbines is emission-free at the point of generation, and to this extent it does not contribute to global warming. However, there are many emissions and pollutants associated with turbine manufacture and delivery and in the construction of the wind farm site with its access roads, grid connections, substations, etc. Each turbine foundation requires between 500 and 1,000 tonnes of concrete and aggregate; concrete manufacture is one of the largest sources (about 7%) of man-made CO2 emissions. All these industrial processes contribute to global warming.

4.2 Removing CO2 “Sinks”

Many wind farms are being proposed on Forestry Commission land. Building a wind farm on forested land involves chopping down vast areas of trees, which, if left standing, would absorb CO2, but do not remove CO2 from the atmosphere. According to the Environment Agency, one acre of coniferous trees absorbs 3.5 tonnes of CO2 each year. However, when trees are clear felled, the decomposition of vegetation that is left behind actually adds to the CO2 emissions problem. At the Cefn Croes wind farm site, not only were acres of forest clear felled, but deep ancient peat bogs were also stripped off and drained, releasing stored CO2 and methane into the atmosphere. As the peat gradually dries out, it will continue to oxidise and release even more CO2.
4.3 CO₂ Savings in Perspective

Electricity generation accounts for only one-third of our CO₂ emissions the bulk comes from aircraft, vehicle exhaust, domestic heating and industrial processes. According to DTI estimates, reaching the 2010 renewable energy targets would achieve a reduction of about two million tonnes of CO₂ per year. Even if this were achievable, it is not impressive when viewed in relation to national and global emission rates. A 2-million-tonne reduction of CO₂ is a mere 1.7% of total UK emissions (550 million tonnes) and 0.0004% of world emissions (24,000 million tonnes). Global emissions are expected to rise by 2% a year, mainly from China and India. Wind turbines can have no significant effect in reversing, or even slowing down, these global warming trends.

5. Environmental Damage

Building a wind farm with all its associated works and grid connections is a major construction project that inevitably causes environmental damage

5.1 Visual Intrusion

Even wind-energy enthusiasts have to admit that these giant machines are out of keeping with the landscape. They are built on high-altitude, prominent sites to catch the wind, marring some of the most scenic mountainous regions of Wales. To improve output, turbines are becoming bigger. The turbines being proposed for the Welsh hills are usually about 400 feet tall, about three times the height of a typical electricity pylon, with a bladespan greater than the wingspan of a jumbo jet. Our remote and beautiful landscapes are further degraded by hundreds of miles of pylons and transmission lines needed to transport the electricity to the grid system and on to more populated parts of the UK. The visual intrusion of these structures contravenes local development plans.

5.2 Environmental Degradation

Turbine construction will inevitably affect the local environment, probably destroying wildlife habitats. Building access roads, crane pads, and concrete foundations, felling trees and draining peat bogs change the soil composition at the wind farm site. The result is faster run-off of water during heavy rainfall with the associated risk of flooding in the lowlands. Once the rural uplands have been degraded by turbine construction and access roads, there is the danger that the area will be opened to further erosion through vehicle traffic and the pressure for further development.

5.3 Hydrological Disruption

Wind farm construction can disrupt the hydrology of the area and contaminate water supplies. At Ovenden Moor wind farm a 200-foot turbine cracked the bedrock and diverted the natural watercourse. Excavation of cable trenches caused peat to dry out, and tracks to the turbines formed pools of floodwater that could not drain away. The developers of the Blaengwen wind farm admitted in their Environmental Statement that “the proposed turbines, crane pads and tracks have the potential to disrupt the hydrology regime of the site”; nevertheless, they did not feel it necessary, nor did the planners insist, that they undertake a hydrology study of the area. The site is drained by several watercourses and there are a number of private water supplies within a few miles of the site. Yet there has been no investigation into the potential effects that this construction project, which will involve blasting or drilling into the bedrock to build the turbine foundations, may have on the hydrology of the area and the water supplies of nearby properties. It is hard to imagine what other major construction project would be allowed to proceed with so little regard for the inevitable consequences for the local environment.

5.4 Damage to Peatlands

Peatlands are vitally important on a worldwide scale. The Ramsar Convention recognises that peatlands are a habitat that is generally overlooked, misunderstood, under-recorded, and yet which represents more than 50% of the world’s terrestrial wetland, and which holds around 25% of the global pool of soil carbon. The world’s peatlands contain more than three times the amount of carbon than is stored in the world’s tropical rainforests. The carbon in peat is stored for thousands of years. During the construction of a wind farm at Derrybrien, Ireland, in October 2003, there was a bog slide. Here is an extract from the report on this incident:

The whole rationale for constructing wind farms is that they reduce CO₂ outputs by providing energy at a much lower rate of CO₂ release than energy produced by fossil fuels. In most parts of the landscape, the CO₂ outputs from wind farms are associated only with original construction of the components, and then vehicular emissions linked to development of the wind farm site and
subsequent turbine maintenance. Peatlands are the one part of the landscape where wind farm construction results in significant additional and ongoing CO\textsubscript{2} release. This is because peatlands represent substantial long-term stores of carbon which is released if they are disturbed . . .

It is thus difficult to understand the logic of disturbing and releasing such long-term carbon stores in order to install devices whose whole purpose is to reduce carbon emissions. If wind farms are to be built, it is surely sensible to avoid using a habitat which, as a result of the wind farm, will release CO\textsubscript{2} into the atmosphere throughout the life of that wind farm.\textsuperscript{10}

6. Noise Pollution

The low-frequency noise and vibrations from wind turbines can be very disturbing for some people and have serious health implications.

6.1 Low-Frequency Noise and Vibration

Noise of the mechanical gearing system is similar to that of a motorcycle and this can be quietened to a limited extent. But the low-frequency, penetrating sound of the rotating blades is more troublesome. It has been compared to the low thud of base notes from loud music, or the sound of a helicopter at a distance. So far there has been no success in eliminating this noise, which can continue day and night for extended periods. Low-frequency noise, which is sometimes inaudible, is ground born felt through vibrations that can resonate with the human body; it travels for several miles, much further than audible noise. However, developers do not generally acknowledge that wind turbines do produce low-frequency noise and vibrations, and they assume there will be no noise problems for residents living more than 500 metres away from a wind farm. At a recent wind farm planning hearing in New Zealand, residents living up to three kilometres from a wind farm described how their lives were disturbed by turbine noise and vibrations, sometimes for several days on end.\textsuperscript{11} For first-hand reports on the problems of turbine noise see www.windfarm.fsnet.co.uk, the website for a group of residents living near a wind farm in Cumbria.

6.2 People’s Reactions to Low-frequency Noise

A recent study of a 17-turbine wind farm by Fritz Van den Berg,\textsuperscript{12} a physicist at the University of Groningen in the Netherlands, noted that residents living 500 metres and more from the site reacted strongly to the noise; even those living up to 1,900 metres away from the wind farm had expressed annoyance. Van den Berg believes that infrasound may be a significant factor in the audible noise problem because the inaudible frequency modulates the audible sounds, creating periodic sound, which is stronger at night. He notes that this effect is amplified by the interaction of groups of several turbines. Van den Berg also concluded that background noise did not mask the rhythmic thumping noise as the blades pass the tower. Another study into low-frequency noise concluded that “... the levels of both ground-born and air-born sound which cause disturbance are lower in amplitude than originally thought to be troublesome or to be detectable by people.” The report went on to say that because of rising levels of low-frequency sound, “... it is not unreasonable to speculate that in future a greater proportion of the population will be troubled.”\textsuperscript{13}

6.3 Developers’ Noise Measurement

In assessing the suitability of a site, wind-energy developers tend to rely on out-dated information and research methods. For example, the developers of the Blaengwen wind farm claim in their Environmental Statement that there will be no noise problems for residents more than 500 metres away from a turbine and that most noise will be masked by background noise. In rural areas where wind farms are being built there is very little ambient background noise, but even if there were, recent research shows that background noise does not mask the noise from wind turbines. The Blaengwen developers used the ETSU-97 “The Assessment and Rating of Noise from Wind Farms” as a basis for assessing the noise implications. This report was published almost 10 years ago and the turbines studied were 450 kW machines. According to many acoustics experts, this is not an accurate benchmark for assessing the noise from modern wind turbines because the turbines studied were much smaller and the report does not take into account more recent research on the subject.

6.4 Health Issues

For some people living near wind turbines there is no effect, but for others the low-frequency vibrations can be very disturbing, causing recognised health problems such as irregularity, headaches, dizziness and sleep disturbance. Research by Dr Amanda Harry showed that all but one of the 14 people living near the Bears Down wind farm in Cornwall had experienced increased incidents of headaches, and 10 said they had problems sleeping and suffered from anxiety. According to Dr Harry, a local GP in the area, there was a range of reported symptoms from headaches, migraines, nausea, dizziness, palpitations and tinnitus to sleep disorders, stress anxiety and depression. Dr Bridget Osborne, a doctor in Moel Maelogan, north Wales, where three turbines were erected in 2002, has presented a paper to the Royal College of General
Practitioners in which she reported a marked increase of depression suffered by local people. Several residents living near the Blaen Bowi wind farm in Carmarthenshire have experienced dizziness and headaches since the arrival of wind turbines near their homes.

7. Light Pollution

Strobe effect and shadow flicker caused by wind turbines and pulsating lights that are sometimes installed on the turbines themselves are sources of light pollution

7.1 Strobe Effect and Shadow Flicker

The strobe effect when sun is behind the rotating blades can, according to medical opinion, cause dizziness, headaches and trigger seizures. Shadow flicker and reflected light from the blades can also cause problems. These light disturbances are experienced inside the home as well as outside. In April 2005, the BBC reported that the owners of a wind turbine near the Whitemoor Prison in Cambridgeshire had agreed to the turbine off in the early mornings to prevent possible “security problems” because the prisoners were becoming upset by the flickering shadows. Homeowners suffering from shadow flicker are not able to strike such a deal with the wind farm operators. For first-hand reports on the problems caused by light disturbances see www.windfarm.fsnet.co.uk, the website for a group of residents living near a wind farm in Cumbria.

7.2 Pulsating Lights on Turbines

Because of the great height of the new generation of turbines, which are built on high hill tops, there may be need to install flashing red lights to prevent aircraft collisions. There are pulsating lights on turbines in France, for instance. In the case of the Blaengwen wind farm planning application, the developers and planners dismissed the issue of pulsating lights; however, they were unable to guarantee that flashing lights will not be installed when the wind farm is operational. If this happens, local residents will be adversely affected and the landscape will be further degraded with light pollution.

8. Threat to Wildlife and Livestock

Wind farm construction is a threat to wildlife. Once operational, wind turbines kill birds and bats. Noise and light flicker from turbines can disturb livestock

8.1 Bird Kills

The construction process, with access roads and links to the grid, wildlife habitats. According to the RSPB, birds may be scared away from their usual locations during construction and/or operation of wind turbines. Access roads and buildings may destroy feeding, breeding and roosting sites. There is considerable evidence from around the world that spinning blades have killed huge numbers of birds. This seems inevitable when one considers that turbine blades weigh in the region of 1.5 tonnes and their tips can travel over 180 mph. At Blaengwen, the 45-metre-long blades of the proposed turbines will sweep within 20 metres of the ground, posing a considerable threat to all birds and bats in the area. According to the RSPB, birds may fly into the towers or the blades, especially during storms and conditions of poor visibility. The turbines at Altamount Pass in California, the largest wind-farm area in the world, have on average killed 200–300 redtail hawks and 40–60 golden eagles each year. At other wind turbine sites in southern California, an estimated 7,000 migrating birds are killed each year. A US expert has launched a lawsuit against the wind farm. The first major study into bird kills, carried out in northern Spain, found that about 6,000 birds and of bats were killed by turbines in one year.14

8.2 Bat Kills

Bats kills are also a serious problem. It is suspected that bats are killed from turbine chop and shock death from wake turbulence. Scientists with the Bat and Wind Energy Co-operative studying two wind farms sites in the USA found that the 66 turbines at the two sites killed as many as 2,900 bats during the six-week period of the study. They concluded that this was not a sustainable kill rate. Further research was stopped by the wind farm owners. All bats are protected species under UK and European law.

8.3 Wind Turbines and Livestock

The noise and light pollution mentioned above may also be harmful to livestock. The British Horse Society has expressed concerns about the effects that low-frequency noise, unexpected start-up and shadow flicker may have on horses. The Brechfa Forest, an area designated by the Welsh Assembly for wind farm development, is a major venue for the GB Endurance, a national long-distance horse-riding club.
9. **Jobs and Tourism**

*Wind farms threaten the local tourist industry and create few, if any, jobs.*

9.1 **Threat to the Tourist Industry**

Evidence from Europe suggests a 40% drop in tourism in areas where there are wind farms. 2002 Visit Scotland Survey of visitor attitude showed that tourists avoid landscapes with wind turbines earns £2 billion a year for Wales. It contributes 7% to the GDP. Agriculture contributes 2%; the electricity industry also contributes 2% typical wind farm employs one maintenance person.

9.2 **Effects on the Rural Economy**

The effects of a drop in tourism will be felt most keenly in rural areas. Most tourists come to Wales to enjoy the peace and tranquility of the countryside and to engage in outdoor activities. Wind farms are incompatible with this type of tourism. The result will be fewer visitors to rural areas and, therefore, fewer tourism-related jobs in communities where employment opportunities are already very limited. Our Action Group is aware of three rural business enterprises a game shoot and two sound studios whose continued existence is under threat from proposed wind farms. All these businesses employ local people, and visits from clients outside the area to these businesses are a benefit to the local economy. The closure of these businesses will be a loss to the local community.

10. **Property Values**

*Wind farms have been shown to reduce the value of nearby properties*

10.1 **Legal Ruling on Loss of Value**

There has been a legal ruling on the loss of property value against a couple in the Lake District who sold their house without telling the buyers that a wind farm was likely to be built nearby. The judge, Michael Buckley, upheld the purchasers' claim that their house had been de-valued as a result of the noise pollution, light flicker and damage to visual amenity caused by wind turbines, and he ordered the vendors to pay compensation of 20% of the purchase value of the house.

10.2 **Even Proposed Wind Farms De-value Properties**

In May 2005, property-owners in the Brechfa Forest, one of the areas the Welsh Assembly has designated for large-scale wind farm development, had a firm offer of £318,000 on their house. But a week later the prospective came back to them with a much reduced offer of £250,000. The buyer claimed to be doing the sellers a favour by taking the house off their hands for more than the 40% cent loss they could expect if turbines are built nearby. In July 2005, a study of eight properties near a proposed farm estimated that the total loss in value if wind turbines were built nearby would be in excess of £1.5 million, or typically 20–25% on each property.

11. **The Economics of Wind Power**

*Wind power is one of the most expensive forms of electricity; it survives on direct and indirect subsidies. This extra cost to taxpayers is not good value because wind energy cannot provide firm generating capacity nor can it make a significant contribution in reducing greenhouse gas emissions*

11.1 **Cost of Wind Power**

According to a report by the Royal Academy of Engineering18 the cost of generating electricity from onshore wind farms is 5.4 pence per kWh with standby generation. The cost of generating electricity from offshore wind farms is 7.2 with standby generation. (The cost of the standby generation capacity was based on the cost of an open-cycle gas turbine, which is the cheapest new plant option.) In comparison, the cost of generating electricity from gas-fired (CCGT) plant is 2.2; from nuclear fission plant, it is 2.3, which includes decommissioning costs. (Decommissioning costs are assumed to be neutral in the calculations for the cost of wind power.)

11.2 **The Subsidy System**

Wind-generated electricity is too expensive to be commercially viable without huge subsidies. It has been estimated that wind farms receive about thee times as much in subsidies as they do producing electricity. The Renewable Obligation subsidy system pays for wind power at the point of generation, not delivery. This means that even the wind-generated electricity that is lost in transmission or wasted because it is generated
when there is no demand is rewarded with government subsidies. The Committee of Public Accounts Report on Renewable Energy, published in September 2005, concluded that the Renewable Obligation subsidy system gives undue support to wind power at the expense of other renewable technologies.

11.3 Cost to Consumers

The Committee of Public Accounts Report on Renewable Energy, published in September 2005, estimated that the Renewable Obligation subsidy system will be adding £1 billion a year to electricity prices by 2010. The expansion of distribution and transmission capacity needed to meet the Government’s 10% renewables target will add another £1.5 billion to consumer costs.

11.4 High Cost for Poor Results

This high cost of wind power for taxpayers and consumers is unjustified given the poor performance of wind turbines in providing firm generating capacity and reducing greenhouse gas emissions. Wind power is not a useful technology in fighting global warming, nor can it make a reasonable contribution in meeting the UK’s growing energy demands. We are paying a very high cost for very poor results.

REFERENCES

15. Reported in Charleston Gazette, Charleston WV, 8 June 2005.

Written Evidence from Cefn Croes Action Group

1. THE CEFN CROES ACTION GROUP

1.1 The Cefn Croes Action Group is a Welsh group which was formed to oppose the construction of a wind power station at Cefn Croes, Ceredigion. Cefn Croes is the largest consented wind power station constructed in the UK. The CCAG initiated proceedings in the High Court of Justice in 2002 in an attempt to halt the development at Cefn Croes.
1.2 The CCAG remains active, both with regard to perceived illegalities in connection with the Cefn Croes development and with the proposed development of a major wind power station at Camddwr (Upper Tywi Forest) and elsewhere in the Cambrian Mountains.

1.3 The CCAG has considerable experience and expertise regarding wind power as a result of its researches and the knowledge of its members, not least because of its involvement in the High Court litigation mentioned above. Alone amongst Welsh organisations, it has had the courage and energy to confront the Government. Further legal actions are currently being considered.

1.4 The CCAG’s monitoring of the construction of the Cefn Croes Power Station and its transmission lines proves conclusively the deleterious impact of such development upon the landscape; such impact is caused not only by the visible nature of wind power turbines, but also by the construction of approach roads, turbine foundations and power lines and substations. The bulldozer is not a friend of the natural environment. Eight hundred acres of land were clear-felled to provide the site at Cefn Croes. This amounted to the felling of an estimated 80,000 trees.

1.5 It is salutary to note that there has been a reluctance on the part of the decision makers to inspect the Cefn Croes site. The Rt Hon Patricia Hewitt, Secretary of State at the Department of Trade and Industry forebore to visit prior to giving the consent to develop (23 May 2002) and has declined subsequent invitations to visit. Members of the National Assembly for Wales have been similarly reluctant to inspect the damage caused by the infrastructure.

1.6 The CCAG is beholden to no-one: it receives no financial support from any source, not does it have any financial or commercial interests in this controversial matter. It consists of concerned individuals who wish to preserve the Welsh landscape. It also aims to prevent the exploitation of Wales yet again. As yet Wales has received little benefit from the exploitation of coal and other minerals, water resources or indeed afforestation.

1.7 The CCAG supports all efforts to promote energy saving.

1.8 It should further be stated that the wild places have no-one within their areas to speak out on their behalf, by their very definition they are uninhabited; they are silent. CCAG seeks to give voice to such concerns.

2. THE OBJECTS OF THE CEFN CROES ACTION GROUP

2.1 The objects of the CCAG may be stated clearly and simply: it opposes any industrial development of the Cambrian Mountains. Wales’s wild places must be protected.

2.2 Once the wild places have been industrialised, they are lost forever (whatever lip-service may be paid to decommissioning and restoration). Even the most superficial inspection of the Cefn Croes power station will reveal the irremediable damage caused to the landscape, the ecology and the environment.

2.3 The CCAG seeks to educate decision makers and the public as to the limitations of wind power: it is not the panacea its proponents advocate. Reference may be made to CCAG’s website www.cefncroes.org.uk

2.4 The CCAG is willing to suggest practicable and realistic ways of supporting and benefiting local communities.

2.5 The CCAG is agnostic regarding nuclear power. (The CCAG has no connection, formal or otherwise, with the nuclear industry.)

3. TAN 8

3.1 It is interesting to note that, of the consultative bodies for on-shore power developments Annex A 2 p 16, there is not a single one situated in Wales. Should Wales place its destiny in the hands of such institutions?

3.2 The CCAG considers that Wales and its resources are being exploited.

3.3 It is also germane to note that as far as the Cefn Croes development is concerned, there has been minimal Welsh involvement: the contractors are admittedly from Ruthin, but the equipment is foreign, the turbine towers are Danish, the nacelles and rotor blades are German; even the abnormal load transport drivers are Dutch and Swedish. Jones Bros of Ruthin are currently the subject of a prosecution by the Environment Agency for an “alleged” pollution incident involving a peat slide at Cefn Croes.

3.4 The developing company was registered in Scotland; it had American shareholders and it is now wholly owned by Falck Renewables, an Italian company registered in Milan.

3.5 There has been little benefit to the local community during construction, other than the provision of lodging and catering. Most of the roadside aggregate was quarried illegally from on-site “borrow-pits” without planning permission, and the concrete was made on-site.

3.6 It is not unreasonable to question who drafted TAN 8: it is not impossible to discern the hand of the proponents of wind power.
3.7 It is noteworthy that the sites identified by TAN as being suitable for wind power development consist of some of the wildest remotest mountain areas of Wales: eg Nant-y-Moch, Drosyl. There is a 53% congruity with the public estate holdings managed by the Forestry Commission.

4. THE POLITICAL ELEMENT

4.1 It is difficult to avoid the conclusion that the Government’s promotion of wind power is a cynical gesture to demonstrate that it is doing something to combat global warming: wind turbines are by their very nature very visible. Is it a sop to the green lobby?

4.2 In this area, as in others, government policy is based on an artificial horizon of five years, imposed by the electoral cycle. Climate change and the energy needs of Wales and Great Britain require a proper long-term view.

4.3 This being so, the English government and the National Assembly for Wales have embarked upon an expensive and radical programme of action, as outlined in the Energy White Paper 2003, which places undue emphasis on the development of renewables, in particular, wind (based on an alarmist view of climate change). The landscape of Wales is being sacrificed upon questionable economic, scientific and engineering arguments.

4.4 For example, it is suggested that Wales can become a world leader in renewable energy. This may indeed be so in connection with technology still to be evolved (tidal wave, biomass); it is both futile and mendacious to assert that this can ever apply to on-shore wind turbine power when all the major players are foreign. Does Wales expect to emulate or indeed exceed the Danish, Spanish and German wind power companies—or indeed the Italian?

4.5 It is clear to the CCAG that catastrophic changes are being imposed on the Welsh landscape in an over-hasty and panic stricken way. Devastation becomes widespread for very little gain or benefit.

5. ANALYSIS OF THE PROVISIONS OF TAN 8

5.1 This response does not propose to analyse each provision of the Consultation Paper in detail. Indeed the arguments put forward above should render such analysis redundant. Neither does it propose to analyse the technical and engineering aspects of wind power. It must be pointed out however that the nomenclature employed is misleading: “windfarms” they are not: they are industrial installations, large and very visible, supported on substantial foundations, with substations and overhead power lines expanding across the landscape. The National Grid will need substantial reinforcement, and new transmission line and substations in wild places where currently there are no transmission infrastructures

5.2 The Map 2—Strategic Areas is misleading in that it omits the Camddwr development proposals. This represents one of the largest wind power stations planned for Great Britain, or indeed Europe. Is this a mistake, or does TAN 8 presume that planning permission will be granted for this development?

5.3 The map shows Nantymoch as a strategic area (Strategic Area D: Map 2). As with Cefn Croes and Camddwr, once that area has been developed industrially, all the remote wild places in Wales (apart from the National Parks) will have been developed. This is a prospect which appals all true Welshmen. Is it necessary to despoil a whole mountain landscape for developments which have, at best, only the most minuscule impact upon greenhouse gas reduction and electricity production?

5.4 TAN 8 proposes relaxations of the planning rules governing wind power stations. Upon its past performance it is difficult to discern what difference this would make to the Planning Committee of Ceredigion County Council, given its previous rubber-stamp attitude towards all applications regarding wind power.

5.5 When considering the Cefn Croes application the Planning Committee of Ceredigion County Council approved the application, after minimal discussion and against the professional advice of its own Planning Officer. Similarly, with applications for anemometer towers, the precursors of more wide-ranging wind power applications. In any case, the consent for the development of the Cefn Croes power station was taken in London, at the Department for Trade and Industry.

5.6 The government targets are only targets; they have no force of law. They impose no legal obligations, although that is often how they are interpreted.

5.7 It is not irrelevant to state that Ceredigion already produces more electricity generated by renewable power than it consumes: Cwm Rheidol Hydroelectric power station produces sufficient electricity for 49,000 households—but there are only 33,000 households in Ceredigion. Then there are now four wind power stations operating: Ystumtuen, Mynydd Gwd, Ceredigion therefore produces more than three times its domestic electricity needs from renewables.

5.8 In 1992 Dyfed County Council (CCC’s predecessor) instituted a landscape assessment, to search for areas for wind power stations—but this was dropped because of planning blight.
5.9 TAN 8 completely ignored the impact of mass wind power installations upon the Welsh tourist industry. Why gamble an industry which produces real jobs and wealth and which is here now against weak promises of a bonanza from wind? Ceredigion’s main source of income is already tourism, which exceeds the income derived from agriculture. Indeed, farmers are exhorted to diversify into rural tourism.

5.10 TAN 8 states that wind power sites will be “environmentally friendly”? George Orwell, wouldn’t that thou were here now.

5.11 TAN 8 (cl 43) refers to local community involvement. The issue of wind power is of paramount NATIONAL significance; to allow such issues to be decided by a few local communities—no doubt ill-informed and subject to overwhelming commercial and other pressures—is to demonstrate the most cynical application of the policy of “divide and rule”.

5.12 It should further be pointed out that a policy of local community consultation lends a spurious “democracy” to the issue of wind power. The consideration of wind power, renewable energy, conservation of energy supplies, reduction of CO₂ emissions and global warming are complex and will be subject to controversy for many years to come. Such issues must be decided upon technical and, engineering and scientific the CCAG would argue, upon aesthetic grounds. And if it is suggested that wind turbines improve a landscape, surely it is impossible to improve upon nature?

6. TECHNICAL/SCIENTIFIC

6.1 The basic problem with wind power is that the wind blows intermittently. There must therefore be “rolling” back-up. “Rolling” back-up means conventional fired-up power stations, whether coal or gas-powered (or even gas turbine fired jet engines). It takes considerable time to fire up such installations; they cannot be switched on instantaneously. “Rolling” back-up therefore represents duplication.

6.2 Wind turbines cannot operate if the wind blows too strongly—or not at all.

6.3 Engineering studies indicate that wind power stations can, at best, deliver only some 35% of their theoretical capacity. Over time their output is less. And at times, of course, their output is nil. Figures from OFGEM confirm that wind factories actually only produced 24% of their installed capacity.

6.4 CCAG have endeavoured to get figures from the national Assembly for Wales, government departments, electricity supply companies and Falck Renewables for the daily or overall electricity production from Cefn Croes. The fact that there has been a refusal to disclose such figures leads to the conclusion that the expected amount of power generated has not been achieved. They seem unaware of the existence of the BETTA obligations and of the fact that power flows are metered in real time to determine the actual quantities of electricity produced and consumed at each location. The Select Committee is requested to press from this information.

6.5 It would be instructive to know the amount of power generated by Cefn Croes on Tuesday, 22 November (a very cold day). CCAG suggests that it would be less than a torch battery.

6.6 This question of the actual amount of electricity produced is the central and fundamental question regarding wind generated electricity. Cefn Croes, being the UK’s largest on-shore wind power station to date and presumably state of the art, should be meeting its projected targets. That there has been a refusal to reveal its output figures leads, inevitably, to the conclusion that its projected targets are not being achieved. (If it were otherwise, the figures would be trumpeted to the four winds.)

6.7 If this is the case—and CCAG has no reason to suppose that it is mistaken—the whole of the wind power policy is based on a fallacy. If Cefn Croes cannot produce, then no other wind power station can do so either. It would be irresponsible in the highest degree to base national policy on figures known to be wrong.

7. THE SITE AT CEFN CROES

7.1 The damage to the site at Cefn Croes is considerable: the peat has been bulldozed, the water table interfered with, the flora and fauna irrecoverably disturbed.

7.2 The approach roads represent major engineering feats, with consequent damage.

7.3 It is not an overstatement to describe Cefn Croes as an environmental and ecological disaster.

7.4 The CCAG earnestly request members of the Select Committee to visit Cefn Croes, and to walk the site on foot, to gauge the extent of the devastation—in particular around the peat bog areas of turbines 19–21, 25–30 and 31–39.

7.5 Such devastation will be wrought by most, if not all, new wind power station installlations on the wet upland and afforested sites proposed under the Assembly’s SSAs.
8. Issues of Legality—or Illegality

8.1 The CCAG have good cause to believe that the construction of the wind power station at Cefn Croes was illegal, as it was built on land subject to the Forestry Act 1967, so that it contravened the objects of that Act and the provisions of the Wildlife and Countryside Act 1985.

8.2 This submission is not the place to discuss complex legal issues but reference is made to the correspondence with the NAW (Mr Carwyn Jones) by the CCAG’s Solicitors Messrs Hawkins & Co of Dudley, which gives an indication of CCAG’s contention (see Appendix).

8.3 The NAW, in placing reliance upon Section 39 of the Forestry Act, contends that it gives the Minister unfettered discretion to dispose of forestry land as he sees fit. If the NAW’s interpretation is correct, it is difficult to discern the purpose of the Forestry Act in relation to its estate.

8.4 CCAG strongly contends that such an interpretation is wrong, so that the objects of the Forestry Act, in relation to Cefn Croes and other similar sites in the future, have been and will be breached.

8.5 Such disposals by the Minister will be facilitated by the proposed amendment to the Forestry Act currently under consideration by the Regulatory Reform Committee.

8.6 It is unrealistic to expect the NAW, or the Forestry Commission to acknowledge the illegality which CCAG alleges. Accordingly, CCAG must take legal action to enforce the law.

9. Proposals

9.1 Much more attention must be paid to energy conservation. For example, wind power presently produces 4th (3.7%) of the power lost through transmission inefficiency.

9.2 Public awareness of the need to conserve energy must be fostered, both by persuasion and compulsion (ie taxes, tax incentives). In particular short-haul air travel will need to be controlled; the public will need to be educated that cheap air travel is not an inalienable right.

9.3 There are opportunities for Wales: development of insulation from wool; this would benefit sheep farmers. Photovoltaics, solar panels, geothermal and micro-hydro water warming devices are also relevant.

9.4 The example of Basingstoke’s successful energy conservation measures must be replicated widely.

9.5 It if clear that the Western World faces considerable problems with oil and gas supplies. At the time of writing Brent Crude is $56.56 per barrel—and is not likely to reduce; gas prices are fluctuating wildly.

9.6 This will have a most adverse effect on all Western economies, Wales included. One of the first industries to be affected will be airlines: it is not unreasonable to suggest that the age of cheap air fares is already over (see 9.2). There will be more demand for holidays in Great Britain; Wales is at present well-situated to benefit from such a trend—but not if mass wind power industrialisation has taken place. This is a most important argument against wind power stations in the Cambrian Mountains.

9.7 Wind power stations are industrial installations; they must be placed near to industry and centres of population.

9.8 The CCAG is aware of the problem of local rural unemployment, but the needs of the unemployed must not be allowed to dictate policy to the detriment of the greater good. In any case, the development of tourism represents the best chance of absorbing local unemployment. Wind power will not encourage tourism—and, if there is doubt about this, once mass wind power installations have been constructed, it will be too late to undo the damage.

10. Conclusion

10.1
— What’s in it for Wales?
— What benefit does Wales derive from supplying water to Birmingham and Liverpool?
— What benefit will Wales derive from supplying Power to the National Grid? (It is accepted that certain individuals will benefit greatly.)

10.2 The Select Committee is urged to recognise that wind power is not the answer to Great Britain’s—and Wales’s—energy problems.

10.3 Wales’s wild places must be protected.

Aros mae’r mynyddoedd mawr—and am faint hirach?

Corfwch Cefn Croes—Calfaria Cymru

Appendix: Correspondence (recent) between Hawkins & Co and the Minister for Environment, Planning, and the Countryside NAW.

November 2005
Written Evidence from the Denbighshire Branch of the Campaign for the Protection of Rural Wales

The Denbighshire Branch of the Campaign for the Protection of Rural Wales concerns itself with the “protection and enhancement of the landscape and environment” of the County(1); we are consulted by local authorities on strategic planning matters, and comment on a wide range of planning applications at a local level.

Like most other environmental groups, we are opposed to the current pattern and extent of the deployment of wind turbines in the uplands of Wales, although CPRW’s policy does not oppose land based installations if a site can be found that does not damage landscapes, and is broadly supportive of truly offshore installations away from sensitive coasts(2).

TAN 8 Planning for Renewable Energy(3) designates Clocaenog Forest in Denbighshire and Conwy as Strategic Area A for the installation of wind turbines to a target capacity of 140MW. The Forestry Authority land and other areas in Clocaenog Forest are extensively used by walkers, cyclists and horse riders; with the central zone around Llyn Brenig actively promoted as a recreational centre for these activities and for fishing and sailing. It is a leisure resource that we and the two local authorities are very proud of. It is a centre not only for local people, but also for visitors from Liverpool, Birkenhead, Chester and beyond.

At the time of writing, the consultants Ove Arup are redefining the boundaries of this Area, with a view to concentrating the turbines into as small an area as possible with the least possible environmental damage. When this is complete, Supplementary Planning Guidance produced jointly by the two authorities will be republished. The area chosen is most likely to be the central portion, which is far from most houses but, because of its remoteness, is the area most used for recreation.

Meanwhile, npower renewables have announced their 750MW Gwyn y Mor Offshore Wind Farm(4), to be commenced in 2008, with the project operational in 2010–11. This, together with the consented Rhyl Flats and Scarweather Sands sites (200MW together), brings the total potential installed capacity (after North Hoyle) off the shores of Wales to 950MW.

The table attached [not printed] shows how the TAN 8 target of 2.6TWh additional renewable generation(5) will be achieved, and indeed exceeded, by the implementation of the three further offshore schemes referred to. It is the view of CPRW, therefore, that no further onshore wind turbines are required for Wales to meet its targets, and, from our local point of view, it is unnecessary to destroy the amenity value of the Clocaenog area.

We ask the Committee to take these figures into consideration when addressing item 3d.

We regret that we are not in a position to give oral evidence.

References and Notes

(1) CPRW Constitution 25 June 2005.
(2) CPRW Onshore and Offshore Policies 2005.
(4) Project Update and Exhibition Information—npower renewables 2005.

1 December 2005

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Written Evidence from Kevin Dibble, First Hydro

I write in response to your recent announcement of an Inquiry into Energy in Wales, with the intention of updating the committee on the scope of International Power’s involvement in the energy sector in Wales.

As you may know, International Power plc is a global owner and operator of independent power plant, having interests in over 16,000 Megawatts of generation capacity worldwide. It was created in 2000, as a result of the demerger of National Power.

In Wales, it owns the 500 MW gas-fired power station at Deeside, and since December 2004, has had a controlling stake in First Hydro Company (FHC), the pumped storage hydroelectric generator based in Snowdonia. FHC was acquired at this time from US utility Edison Mission Energy by a 70:30 joint venture partnership between International Power plc and Mitsui of Japan. It covers three sites in North Wales employing a total of around 200 people: Dinorwig Power Station (1,728 MW), Ffestiniog Power Station (360 MW) and an associated trading office in Deeside.

All of these power stations are operated on a merchant basis in the GB Electricity market, along with International Power’s other power stations at Rugeley and Saltend in England. Furthermore International Power is active in the development of renewables, and has a keen interest in a number of new wind projects in Wales.

I trust that this information is useful background for the committee in defining the current electricity picture in Wales.

1 December 2005
Written Evidence from Janet Haworth

I am writing to the Select Committee because I feel desperate about Npower’s planning application to site the 8th largest off-shore wind factory in the world in our beautiful bay.

The Select Committee on Welsh Affairs has been considering Welsh energy policy and I wanted to take this opportunity to write to you about the Npower proposals because I believe the proposals illustrate serious flaws in the government’s energy policy as it is being applied in Wales.

A year ago if asked I would have expressed a preference for wind power over nuclear or carbon based energy generation. I have changed my view because my understanding of these issues has been changed by knowledge.

The knowledge that wind power is far less efficient or economic than is being claimed by the developers of wind factories. An understanding that if the UK is to be able call upon its own energy resources then nuclear will be part of that provision. The realization that wind power generation has negligible impact on the level of CO2 emissions.

I am disappointed that government has not incentivised local councils to promote responsible energy policies. For example national awards for local authority buildings that meet energy conservation targets and maximize opportunities for re-cycling. A review of building regulations to insist on energy conservation features in all new builds. Better public transport and support for research and development of tidal power and the exploitation of biomass. These latter ideas have less impact on our environment than wind factories.

The evangelical rush for wind power has resulted in Wales having 50% of the UK total number of wind turbines while having only 8.5% of the UK land mass:

“Wales is becoming the dumping ground for the UK’s wind turbines” (1)

This is what happens when democracy is silenced. When TAN 8 was formulated no debate was permitted in the Welsh Assembly. Cumulative impact as a valid reason for objecting against the development of wind factories has been removed and this has encouraged developers such as Npower to place before the DTI their outrageous proposals for the last stretch of heritage coastline between here and St Bee’s Head in Cumbria.

We already have 30 wind turbines off Prestatyn some 14 miles off our heritage coastline and they currently intrude upon our bay on clear days. Consent already exists for Rhyl Flats which will bring 30 larger turbines much closer into the bay. These will further erode the sea scape views currently enjoyed by visitors . The well established residential areas of Rhos-on-Sea and Colwyn Bay will be adversely affected by this development. Not satisfied with this and doubtless attracted by generous government grants Npower has submitted a third proposal to site some 200 of the largest turbines ever, in the bay. The visual impact will be to fence our bay with a wall of steel.

Npower claim that there will be no impact on tourism and that the industrialized landscape which will result from their endeavours will attract tourists. Tourists do not visit industrialized sites in significant numbers. Hundreds and thousands of our visitors work and live in urbanized and industrialized locations in the Midlands and North of England and they come to Llandudno to escape that environment for a short while. Hotel rooms with a sea view attract a premium and year after year our town guide proudly displays our stunning promenade and the sea views.

Llandudno is unique among the Victorian seaside resorts. It has survived largely intact because Mostyn Estates has been able to protect the original vision of the Victorian architects and engineers who have bequeathed us this wonderful town with its wide streets and elegant buildings. The Victorian crescent on the promenade has survived virtually in tact and unblemished by the usual planning disasters which have defiled other seaside towns. Llandudno has survived and continues to thrive because of the way it looks. It really is that simple. That is why people come here. That is why 18% of all bed space sold in Wales is sold here. Tourism supports a prosperous local economy which ripples out into Wales. The local tourist industry provides jobs and work for a multitude of small businesses which exist to serve the local tourist industry. Npower’s plans will threaten that economy and they will deny to hardworking people from our Midlands and northern towns a delightful holiday resort which is accessible to them within two hours. With the new virgin train service from London many members of the local Hospitality Association report that they are now welcoming visitors from a wider catchment area.

There are plans to extend our theatre and conference centre, developments to our popular shopping centre and the building of a new swimming pool. Llandudno prizes its Victorian heritage but not at the expense of sensitive developments which are in keeping with our town and its breathtaking and unique sea and mountain setting.

The placing of any more wind factories in our bay will threaten and put at risk the local tourist industry.

The assessment made by Npower regarding the noise we are likely to hear from 260 wind turbines are unconvincing. They fail to acknowledge the impact on our town of the constant flickering of light when 780 blades are slicing sunlight.
Most disturbing of all is their avoidance of any in depth analysis of the possible impact of massive and unprecedented engineering works on and around a natural marine sand bank, namely the Constable Bank. This feature provides a natural wave break when the sea is stormy. It is a vital resting place and feeding ground for marine life and sea birds. It is part of our natural flood defences.

During the construction phase marine life and birds will be distressed and their feeding grounds endangered. The constant pile driving will be heard on-shore.

People will say:

“Llandudno is just not the same anymore.”

“What a pity, they allowed all those turbines to be put in the bay.”

1 December 2005

Written Evidence from Energywatch

1. Introduction

Energywatch is the independent watchdog for gas and electricity consumers in Great Britain. We provide free, impartial advice on a range of energy issues. We also take up complaints on behalf of consumers who are experiencing difficulty in resolving problems directly with their energy companies. In the last financial year, we dealt with 70,000 complaints and 137,000 enquiries on behalf of energy consumers across Britain.

Energywatch Wales employs 10 Consumer Advisers who handle the public’s complaints and enquiries, taking over 16,000 calls from consumers per year in both English and Welsh. Energywatch welcomes this inquiry and the opportunity to outline the experience of consumers in this area. In particular we will focus on the current provision of energy in Wales as it relates to consumers who are on low incomes or at risk of fuel poverty.

During 2004–05 Energywatch Wales received 10,000 complaints and enquiries from domestic and business consumers across Wales. The most common area of complaint for Welsh consumers, accounting for 47% of all complaints and enquiries, was problems with billing and account management. On average, 87% of consumer cases were closed within 35 days and 95% of all cases were resolved and closed within 66 days. Recorded customer satisfaction with Energywatch’s service in Wales was the highest of any of the national or regional offices at 92%.

2. Strategic Energy Issues

The end of self-sufficiency in natural gas from North Sea fields and the consequent exposure to higher costs in the wholesale gas market are having a damaging effect on British consumers. A recent report estimated that the slow pace of liberalisation in Europe and the artificial link between gas prices and global oil prices could be costing consumers anything up to £10 billion a year. The Competition directorate at the European Commission has identified a number of features in the European markets that require urgent attention if consumers across Britain are not to continue to pay a premium on their energy bills, for the failure of other EU markets.

The energy policy review announced this week will attempt to provide to reconcile the provision of a strategic framework for energy supply with the demands for security of supply, affordable prices and government carbon reduction and climate change goals.

3. Energy Prices

Energy prices have risen dramatically since 2003. By January 2006 domestic gas prices will have risen by an average of 38% and electricity prices by 29%. The Department for Trade and Industry estimates that a 1% rise in energy prices could put an additional 40,000 households in England in fuel poverty. Similar estimates suggest a 5% rise could have the same effect on 30,000 households in Scotland. No such formula has been developed by the Government or the Welsh Assembly to measure the impact of fuel price rises on fuel poverty in Wales.

Recent price rises have been especially bad news for Welsh consumers who already pay more for their electricity than consumers in England and Scotland. At present consumers in Wales are paying 10% more for their electricity than consumers in the rest of the UK regardless of their payment method. Wales has historically suffered higher electricity prices on average compared with the rest of the UK. The explanation from the industry for the higher prices has been that there was little generation in Wales which meant they had to pay a higher Distribution use of system charge.

Welsh consumers who use LPG to heat their homes are also at a disadvantage. They are not given the same notice of price increases, and are prevented from switching suppliers easily as they need to reimburse their supplier for the “kit” they use which enables them to use LPG in the first place.
Huge price rises are not only impacting on domestic and businesses consumers. The public sector in Wales is also suffering. Money that could go on essential public services is being diverted to meet the rising cost of energy. Between November 2003 and November 2004, the NHS across the UK saw its gas bill alone go up by £41 million—an additional 57%. In North Glamorgan the NHS Trust saw its energy bills rise by £450,000 between 2003–04 and 2004–05, equivalent to the cost of 80 hip replacements. North East Wales NHS Trust, which provides services for over 300,000 people, across Wrexham and Flintshire, saw its energy bill rise by £460,000 between 2003–04 and 2004–05, equivalent in cost to 230 major breast surgery operations.

The impact on local authorities is equally alarming. Cardiff Council has seen its energy bills rise by an average of 31% in 2004–05 compared with 2003–04. A rise of almost £1 million. If this cost was passed on to council tax payers, each of Cardiff’s households would see £9 added to their council tax bills.

4. FUEL POVERTY IN WALES

The Welsh Assembly is committed to eradicating fuel poverty among vulnerable households by 2010 and in all households by 2018.

The widely accepted definition of fuel poverty is where a household needs to spend 10% or more of income to maintain a satisfactory heating regime. Any household spending 20% or more of its income on heating is deemed to be in severe fuel poverty.

Recent research carried out by the Centre for Sustainable Energy (CSE) on behalf of the Welsh Assembly showed that in 1997–98 there were 360,000 or 31% of households in Wales in fuel poverty. It showed that 72,000 or 6% of households were in severe fuel poverty. At the same time, comparable figures for England were 22% and 3% respectively.

The high figures in Wales were attributed to a combination of low incomes, poor energy efficiency of older housing stock, high fuel prices, high levels of under-occupation and high number of larger homes. Homes in rural areas had a higher incidence of fuel poverty, with the highest levels to be found in Mid Wales and South West Wales, areas with high concentrations of households off the gas network.

Between 1998–2003 falling prices and rising incomes contributed to a reduction in fuel poverty numbers. Figures due to be published shortly in the Welsh Assembly’s “Living in Wales” study on fuel poverty figures for 2004 put the number of households in fuel poverty in Wales between 130,000—170,000—roughly 12% of population. Whilst this demonstrates a considerable reduction from the 1998 figure, our expectation is that the true figure is likely to be significantly higher following the huge energy prices hikes of the past two years.

5. FUEL POVERTY SOLUTIONS

*Home Energy Efficiency Scheme*

The main tool used by the Welsh Assembly to tackle fuel poverty is the Home Energy Efficiency Scheme (HEES). The scheme provides grants of up top £1,500 for energy efficiency measures and advice for those in receipt of a range of benefits, or who have a child under the age of 16. HEES Plus offers grants of up to £2,700 for heating and insulation improvements to householders who are 60 or over and to lone parents with a child under 16. In both cases claimants must be in receipt of one of a range of benefits. A lower level of grant can be claimed by householders aged 60 or over who do not receive a qualifying benefit.

The percentage of those removed from the fuel poor category after measures were installed was very low. This is possibly an indication that the scheme was not targeting effectively enough and not addressing the issues of the fuel poor, even though it was, and still is, the only vehicle in Wales targeting the fuel poor.

Parallels can be drawn with the Warm Front scheme in England. In 2003 the National Audit Office concluded that there was a problem with the eligibility of the Scheme as around a third of the fuel poor may not have been eligible and around two-thirds of eligible households may not have been fuel poor. It also concluded that the heating and insulation measures available under the Scheme may have been insufficient to move households out of fuel poverty in at least 20% of cases, and only 14% of grants reached the least energy efficient homes.

A review of the HEES scheme by the Welsh Assembly Government found that:

— Of the 24,124 households helped by HEES between March 2001 and January 2004, only 29% of which were considered to be fuel poor pre-intervention;

— Half of these were removed from fuel poverty after the intervention of HEES;

— The current criteria adopted for the fuel poor misses out those who are not on benefit and the eligibility criteria should to be extended;

— A fuel price increase of 30% would return almost all of the households moved out of fuel poverty (3,871) back into fuel poverty;
— Of 1,579 respondents 15% felt their fuel bills were a little or a lot more, 46% said they were about the same;
— 11% of all respondents paid a little more on fuel bills and 5% paid a lot more;
— Although over a third had no problems listed 9% of households claimed their heating was inadequate and 21% had problems with draughts, which is of concern given that draught proofing is a HEES measure;

Whilst the HEES is an important tool in tackling fuel poverty, providing advice and practical measures for consumers in Wales, it remains to be seen if it is as effective a means of helping consumers as it could or should be. energywatch would like to see better targeting of the scheme to fuel poor consumers and better measuring of success. At present HEES has a target which measures the number of homes assisted by the scheme. This should be revised to better measure the impact of the scheme in reducing fuel poverty, and on improvements of the energy efficiency and thermal comfort of the home assisted.

Consumers who are not connected to the gas network are not able to enjoy the full benefits from the HEES. There needs to be a greater degree of flexibility to the scheme to allow these consumers to have central heating systems based on fuel supply more readily available in rural areas of Wales, such as wood burning or biomass systems, ground source heat pumps, wind or solar:
— The review of the HEES should be taken forward into a more flexible and targeted scheme that provides support to the most vulnerable regardless of their location or access to mains natural gas.

6. COMMUNITY ACTION

If fuel poverty is to be successfully tackled in Wales, it must be targeted through a co-ordinated approach at a local level by government incorporating a variety of agencies including the NHS, local authorities, voluntary groups, suppliers and consumer bodies like energywatch. energywatch has recently launched a pilot scheme in North Yorkshire to work with a variety of agencies and local bodies to tackle fuel poverty. If the pilot is successful we hope to roll this initiative out to other areas.

There is a growing consensus that local agencies such as social services, primary care trusts and voluntary and community organisations which have good access to priority groups of energy consumers should work more closely with agencies providing specialist energy savings and benefit entitlement and consumer advice. energywatch believes that the particular circumstances in Wales where income levels, housing stock characteristics and the combined health and social services jurisdiction within the Assembly Government would benefit from this approach:
— The Welsh Assembly Government should explore the feasibility of community energy champions, embedded in local agencies but connected to the best available energy saving and consumer advice.

7. DEBT AND LOW INCOME CONSUMERS

As of June 2005, figures from Ofgem showed that levels of debt across Britain stood at 1.1 million gas and 1.3 million electricity consumers. The average size of debt for gas and electricity consumers was £165 and £163 respectively. The average time taken to pay off a debt was 51 weeks for consumers on standard meters and 96 weeks for those on prepayment meters. Those consumers paying off debt by this method was 500,000 for gas and 400,000 for electricity.

Almost a quarter of gas and electricity consumers in debt owed between £100—£300. At the other end of the scale, 5% of gas and 6% of electricity consumers had debts of more than £600. Those figures may sound relatively low, but represent 55,000 and 78,000 consumers respectively, struggling with debts exceeding £600.

Rising energy prices will mean more consumers in energy debt. These consumers are also likely to have council tax and water utility debt as well. A wider range of tools to prevent a debt epidemic are required.

A significant proportion of energy debt is being repaid through pre-payment meters (PPMs) that have been imposed and calibrated to collect arrears at the same time as the consumer is paying for current consumption. For the majority of PPM users, this payment method represents the most expensive payment option. This combination of factors, plus the soaring energy prices witnessed in the last two years, will mean that many PPM users could have to make stark decision over prioritising essential items this winter. Whilst energywatch recognises that for some, PPMs are a preferred payment option and offer the opportunity to manage finances and budget, consumers may not know they are often being penalised by higher tariffs and standing charges. The Public Accounts Committee concluded in May 2005 that PPMs are the most expensive way to pay for energy, costing £60 more a year than payment by direct debit.

At a time when suppliers are announcing two or three price rises within a twelve month period, some are proving incapable of recalibrating their PPM stock at a rate that keeps pace with the tariff changes. This can therefore result in a situation where some PPM consumers are left under the impression they are keeping abreast of their energy costs, only to be left playing catch up when their meter finally does get recalibrated to reflect tariff increases.
For those not on a pre-payment meter, poor industry billing practice can and does lead to debt for many low income consumers. 9% of all consumers surveyed told energywatch that inaccurate estimated bills have led to them owing money to their supplier. This is a figure that looks set to increase as the grim combination of soaring prices and poor billing practices push those who are presently subsisting on the breadline into debt; or in industry parlance: transforms “good payers” into “bad payers”.

Accurate, timely and clear bills would help make a significant contribution towards debt prevention among consumers; allowing consumers to track their energy spend and seek help and advice at the earliest opportunity.

The Government’s own Fuel Direct scheme provides an effective tool for consumers on benefits to repay debt in a manageable way, but many consumers do not know it exists. The scheme, which forms part of the Departments for Work and Pensions’ (DWP) Third Party Deduction Scheme, allows consumers to repay utility debts directly from their benefits at a fixed weekly rate not exceeding £2.85 per fuel type. energywatch would like to see the scheme extended to allow consumers to use it before they get into debt as a debt prevention tool.

It is becoming increasingly important to make more effective use of existing resources as well as seeking new ways of assisting those in debt. Winter fuel payments are a valuable resource for older people in the colder winter months. It may be time to consider whether that approach could be extended in some form to other groups of disadvantaged consumers who have difficulty coping with fuel bills—such as disabled people and families with young children—who do not currently receive this type of assistance.

It may be time to consider the idea of a reduced winter fuel payment, of £50 for example that is paid to all recipients of income support or job seekers allowance, or similar benefits, to help them with their fuel bills. This would be instead of the cold winter payments which are only paid if temperatures go below a certain level and do not acknowledge the recipients ability to pay his/her fuel bills:

— Government should put pressure on suppliers to ensure across the board equalisation of the costs of PPMs to ensure that consumers on these meters are not being penalised by crippling standing charges compared to those on consumers on standard credit meters. NIE in Northern Ireland have demonstrated that smart metering technology can reduce PPM costs to below those paid by standard credit consumers.

— A reformed Fuel Direct scheme to allow consumers to use it as a budgeting tool before they get into debt. We believe such reform would be consistent with the government’s financial inclusion agenda and help consumers avoid debt in the first place.

8. CONSUMERS OFF THE GAS NETWORK

Approximately 20% of the 1.2 million households in Wales do not have access to the gas network. This means that these 240,000 households are unable to take advantage of the full benefits of the energy market, and often end up paying more for their energy supply, especially in winter when consumers need to heat their home for longer. Consumers living off the gas network pay on average 40% more to adequately heat their homes.

The heating system or appliance and the fuel type used in heating a dwelling are significant factors in fuel poverty. Efficient and economic space and water heating are crucial to the provision of affordable warmth. The number of fuel-poor households who do not have access to a mains gas supply are therefore excluded from what is currently the most economic form of domestic heating.

Any network extension is dependent on the gas network company being able to make a return within a reasonable time frame. Transco or Wales and West Utilities can only seek to recover costs from households for a period of five years following extension of the network. In effect this provides an incentive for some households to defer connection until the end of this period when the only charges they will incur are the comparatively low cost of connection to their homes.

Of course there are additional costs that will accrue to householders since, to benefit from a new gas supply, they will have to invest in a new central heating boiler (44% of households off the gas network have non-mains gas central heating). In these circumstances it is not surprising that there have been very few network extensions in recent years. Most activity has taken place in the new-build housing market where almost all target households can be connected to the pipeline and therefore return value to the utility in a twelve month period.

Llay, near Wrexham, has recently become the first place in the UK that has delivered a partnership solution to extend the gas network in an area that previously would not have been commercially viable at nil cost to the local community. The Assembly Government has been involved in this project through the HEES.

As important as the extension of the gas network is the applicability of microgeneration and embedded generation technologies in a domestic or community context. The Government is developing a strategy for microgeneration which will hopefully reduce the costs over the next few years. Such installations have the
potential to augment energy supply for those communities unable to benefit from cheaper gas heating. energywatch believes they have a critical role to play in the alleviation of fuel poverty in communities which are off the gas network and which are unlikely to be connected:

— energywatch believes that Wales should be at the forefront of the emerging microgeneration market. The state of the housing stock and the fact that many households are not connected to the gas network in rural areas means these locations could substantially benefit by engaging communities in sustainable energy projects and at the same time reducing energy costs.

9. Energy Efficiency

In a recent survey by energywatch of pensioners in Wales, 79% said energy efficiency was the most important energy issue for them. At a time when the money that can be saved from switching supplier is diminishing, consumers are correctly identifying energy efficiency as the simplest method to reduce their energy bills. However there is still generally low understanding about consumption within the household.

energywatch believes that better information about energy saving and easier ways of translating that information into observable change in consumption patterns in the home would be one of the most significant contributions to the eradication of fuel poverty. Smarter metering technology has the potential to provide consumers with timely, up to date information at the point of use which enables consumers to see the impact of the energy saving measures or investments in financial and carbon saving terms. A number of trials and examples from overseas and within Great Britain has indicated that improved information can reduce consumption, allow people to budget more effectively and allow supply companies to improve the services they deliver to their customers.

Once armed with more accurate and useful information about their energy usage and associated costs, consumers will be more likely and empowered to seek energy efficiency measures from their suppliers, grants and other schemes:

— Observable and measurable impacts of energy saving actions in a domestic or business context are critical to turn positive messages into positive and sustained behavioural change. The provision of this information in a domestic context should become part of a comprehensive fuel poverty strategy.

December 2005

Written Evidence from Ioan M Richard, Swansea City & County Councillor

Let me first say “Congratulations on holding this Inquiry”—it’s long overdue to get real facts and not opinions.

We need bulk energy production in Wales and the UK to secure our economic future. We need not only bulk supply but a secure reliable economic supply of energy, and if climate changes are down to man’s carbon emissions we need to do something real about that issue also and stop pussyfooting with joking sources of energy like unreliable, expensive, over subsidised, erratic, weak output wind power—we need real clean reliable power in bulk.

IN GENERAL TERMS

The NUCLEAR Option

We need to pursue safe modern nuclear power and ignore the scaremongering of the “rabid people” in “Greenpeace” and so called “Friends of the Earth” and the “Green Party”. They seek to throw up Chernobyl at every phrase they utter. These people are mostly bigoted cranks to put it bluntly and they have influenced Energy politics for far too long distracting us from our real needs and real issues.

The TIDAL Lagoon option

Here is a really excellent option for Wales—far more valid to Wales than nuclear. This has been proven by the eminent Engineers at WS Atkins to be viable—we have in the tide flows of the Bristol Channel one of the greatest world assets in mass clean reliable renewable energy in the world—greater than we could possibly imagine. Sadly every obstruction possible has been put in the way of this by people at the Wales Assembly Government—people not wanting to lose face over their support with useless wind energy!
Clean Coal Technology

Here is a source of energy that’s been scorned, yet it is highly feasible. It grossly annoys me to see pictures on my television screen regularly showing vast clouds coming up from coal power stations purported to be smoke and CO₂ when every scene is actually harmless STEAM from cooling towers!!! Coming back to coal—I’d like to see the workers co-operative at Tower Colliery being encouraged to develop the much talked of Margam Coal Mine reserves for clean coal energy production to secure Aberthaw Power station as a mass electricity producer and as a fringe benefit to supply the giant Port Talbot steelworks with its blast furnace needs of home produced coal with hundreds of well paid jobs. Deep coal mining will always be arduous and dangerous but with modern methods and Health and Safety regulations of today nowhere ever as bad as before in years gone by.

Energy Efficiency

Whilst a lot is being done in this field it is nowhere as good as it should. It is seriously estimated that we waste a third of our energy supplies. We could seriously make massive in roads here. This is a major issue.

Solar; Biomass; Wave Power; Incineration & Gasification of Waste; Hydro etc

A lot is written and spoken of these forms of energy forms. Yet I think in this country we can write—off any thought of mass energy from solar—but in future Building Regulations could insist on solar panelled roofs to building projects that can afford them—eg the obscene profits of the super market giants should be forced into solar panelled roofs. We can forget about wave power—ask any surfer—wave power is totally unreliable as it depends on the whims of the wind—(a lot more on wind later!!). Hydro is not valid in bulk in Wales as we have no big rivers tumbling down from high altitudes, but small schemes may be viable on hill farms. Use of waste from landfill methane and incineration and gasification of wastes are useful in consuming unwanted wastes as long as the emissions are “scrubbed”. Biomass is not valid unless it is on site of source, as hauling biomaterials eg wood chips consumes more diesel better spent as a fuel for another use.

I WANT TO SPEND TIME HERE EXPOSING THE BIGGEST SCAM EVER—WIND ENERGY

Wind Energy—UK Nationally:

Wind energy is kinetic. mass (weight) of wind (air) molecules multiplied by velocity (speed) going in to the circumference of turbine blades—minus the mass multiplied by velocity of it going out the other side. Air is very light and speeds are even low in a storm—the energy available is thus very tiny. Some is lost as friction; transformer heat; noise energy and line voltage drops. Water is a thousand times heavier, thus a wind turbine blade has to be a thousand times bigger than a water turbine. The only plus point is it is clean and free, but in real energy terms it is basically so low it’s farcical. A 400 foot tall wind turbine is rated at maximum at 2 megawatt or 2,000 kilowatt. As wind is so erratic it only averages 24% of 2MgW cutting output down to 480 kilowatts—or 480 single bar electric fires. In a year this sounds a lot:— 480 kw X 24 hrs X 365 days = 4,204,800 kwhrs. Seems big. In a year the UK uses 400,000,000,000 kw hrs. The concept of big numbers is difficult for the brain to wrap itself around—imagine writing 400,000,000,000 and each figure “0” to be drawn 10 times the size of its preceding “0”—try it on paper—after a few it gets so huge you can’t write it even on a large wall let alone paper. So 400,000,000,000 is a truly immense figure and by comparison 4,204,800 is really insignificant. To power the UK we would in theory need 95,000 giant wind turbines decimating the windy west of Wales and Scotland on land and sea. (Peak winter demand would mean well over 100,000). Yet all the UK learned Institutes of Engineers have told the UK Government (which is not listening) that not more than 20% of erratic power could supply the National Grid without power surges causing black outs, and 20% would mean 19,000 giant wind turbines. Even these would need all the existing power stations (unless new gas ones are built) running and burning uneconomically on standby “spinning reserve”—all consuming fuel and still emitting carbon dioxide, whether coal; gas or oil. ready to swing in to full output when the wind dies down or simply gusts unsteadily. Meteorological weather records clearly show we get many such periods and even weeks of relatively calm especially on still frosty nights every year. If we build new gas power stations to replace dirty coal we still have to run the main trans-continental gas pipeline gauntlet through the problem fraught Balkans or Middle East to satisfy the equation of wind supported by gas. Then there’s crippling costs—currently carbon (coal) fired power as at Aberthaw (capacity 1,500 megawatt) sells its electricity at about £18 per megawatt in to the grid. We buy it at approx £71 per megawatt (7.08p per unit), yet wind power sells in to the grid at £68 per megawatt which is 400% more than coal power via a massive subsidy—although the politicians call it a number of names such as “carbon levy” or “renewable obligation” etc but at the end of the day wind power is the highest ever subsidised commodity since the industrial revolution. Currently over 1,000 Wind Turbines in UK supply less than 0.3% of UK electricity—in other words next to nothing—yet if that figure rises significantly the cost of energy will go through the roof, and ruin our economy—and without subsidy there would be no wind turbines—it’s as simple as that. Also remember that electricity generation only accounts for one third of our carbon emissions—1,000 giant Wind Turbines only save 0.09% of our carbon emissions and pollution is a global issue. The bulk of carbon emissions come from vehicle exhausts; aircraft; domestic heating; factory and basic
industrial processes. UK Government claims we could save 30% of our electricity by careful energy saving schemes. We could cut down dramatically on vehicle exhausts if we really penalised heavy cars and the 90% of unnecessary 4X4 vehicles we see on school runs! These should be the easy immediate targets, while we are achieving these we need to frantically pursue other technologies—solar; tidal and even carbon sequestration—being anti-wind desecration does not mean pro-nuclear, although the New Labour Government in London is now firmly advocating nuclear and “clean coal” energy generation, but have not seemingly told their Welsh Assembly Government. In Cardiff the Wales Energy Minister Andrew Davies AM is still foolishly and strongly advocating wind energy as his main piece of policy for Wales.

**Wind energy—local issues in Swansea, Wales**

An example of a firmly proposed wind turbine power station at Mynydd y Gwair common in North Swansea: If this wind power station is built at Mynydd y Gwair common in Mawr ward of North Swansea it will only generate vast amounts of money—our money—for the German owned multi-national business Npower and the family trust of the feudal Lord of the Manor of Gower the Duke of Beaufort one of England’s wealthiest aristocrats. Indeed at today’s prices it will generate £110 million from electricity sales plus a staggering £236 million from subsidies from 39 Turbines—our money! Npower is currently desperately trying to get support for their scheme here which will only save 0.00014 of UK Carbon emissions yet swallow up a quarter of a billion £££££££££ in subsidies—our money !!!!!!! In global terms this is immeasurable carbon savings!

The whole issue of wind energy is wrapped up in deceit to milk the Renewable Energy Obligation system. It is a disgrace and a farce how the pseudo “Greens” have totally beguiled Politicians into this scam of belief that wind energy will reduce global climate change—the fact is—proven by irrefutable statistics above—simple true arithmetic—wind power will never ever stop climate change and neither will it ever contribute to world or UK or Welsh energy needs in any meaningful way—that’s a fact!

A retired science and maths teacher—worked half my life in teaching. Prior to that I worked my first half of my working life both manually and technically in the heavy coal and steel Industries, and an elected Councillor for over 20 years a community activist and above all a family man interested in passing on a secure planet and Wales to my eight grand children and their descendants.

**December 2005**

**Written Evidence from Janet C Moseley**

I am resident in the northern part of the City and County of Swansea, and own five small fields. These are already crossed by a 30-year old gas pipeline, main high-voltage electricity lines and a large pylon, local electricity distribution lines and from next year a new massive gas pipeline which will cross the existing one. Additionally since the publication of the National Assembly of Wales’ TAN 8, I am on the edge of Strategic Search Area E and currently have my registered grazing rights on the adjacent common put in doubt by a proposal for a wind power station on the common.

As a Community Councillor for Mawr I have been approached by worried members of the local community concerning the proposed windfarm. An WDA-funded questionnaire survey for the Mawr Development Trust, with a high response rate and carried out by independent consultants, found along with other unrelated questions, that 83% of respondents stated that they did not want a windfarm on Mynydd-y-Gwair, the area of common land central to Mawr.

Consequently, over the last two years I have of necessity made a study of energy and the position locally. The gathering of this information has involved obtaining data on areas elsewhere in Wales and beyond. I would like to make the following comments below:

1. **UK Government Policy in Relation To:**
   
   (a) the current and future energy needs of Wales; and
   
   (b) the current and future provision of energy in Wales.

   As regards the energy needs specifically of Wales; not only do we use less per head than England, but we generate nearly as much as we use, and ‘export’ the rest to England.

   Although statistics for Welsh electricity seem to be lacking from the normal source of statistics for Wales (http://www.wales.gov.uk/keypubstatisticsforwales/content/publication/compend) figures can be obtained from the Economic Development Committee, Report for Consultation, Review of Energy Policy in Wales
Part 1: Renewable Energy April 2002 table on page 5, which shows the UK 1.2 GW generating capacity per million population and 6.4 TWh/y per million population and Wales 1.8 GW generating capacity per million population and 11.2 TWh/y generation per million population.

Generation ratio 11.2/1.8 = 1.75 ie Wales produces one times as much electricity per head as the UK average.

So the energy needs of Wales would seem to be catered for internally already. It is a matter of policy whether Wales should be looking to be a net exporter of energy as it is of water. The deciding factor in this should not only be the needs of other areas of the UK, but also the amount of despoliation and disruption Wales would suffer by satisfying these needs. This depends on the type of energy generation chosen and the methods of transportation. Public attitudes to this are made more unfavourable by, for example, the new Chief Executive of Transco Gas Pipelines in Wales appearing on television recently saying the new gas mains from Milford Haven would benefit people in Wales as well as in England—when the vast majority of the people who will be affected by the pipeline do not and will not have access to natural gas, but instead have to rely on tank gas (propane) which is the most expensive fuel available.

Similarly, TAN 8 flags up the creation of new and expansion of existing high voltage power lines across Wales.

2. THE RELATIONSHIP BETWEEN THE UK GOVERNMENT AND THE NATIONAL ASSEMBLY FOR WALES—INCLUDING THE DIVISION OF POwers ON ENERGY POLICY

The current situation is seen to be at best a muddle and at worst anti-democratic, as it is far from clear where the responsibility lies. The Prime Minister on a tour of Wales last year blocked questions relating to renewable energy saying it was the responsibility of the Assembly. However, the Assembly imply that they have to follow guidance from Westminster—and from the documents coming out of the Assembly the public perception is that they are acting as a rubber-stamp for central government. Consequently a feeling of disenfranchisement pervades and people cannot get their questions or concerns addressed.

How this should be changed is open to debate, but my personal feeling is that a matter so vital to life and the quality of life in the whole UK should be the responsibility of central government (Westminster) where the demography is such that the likelihood is that there will be from time to time a change of government; which seems unlikely to be the case in Wales.

However it is addressed, the current situation must be changed.

3. THE CURRENT AND FUTURE PORTFOLIO OF ENERGY PROVISION IN WALES INCLUDING:

(a) Nuclear energy

If Wales is concerned only to supply the energy needs of people in Wales, then it may just be possible to manage without nuclear energy, at a price. However, taking a decision to be nuclear-free seems anachronistic when Wales is well within the fall-out area of other countries nuclear power stations over which we have no control, whilst denying the people of Wales the benefits of predictable, adequate amounts of electricity from modern advanced-state nuclear power stations which are far from the suspect safety standards of earlier types of stations. If it is really believed that modern nuclear power stations are unsafe, then the Assembly government should be looking into methods of financing fall-out shelters for the community in case one of the many in France has an accident. Finland is developing methods of disposal of waste (which is much less in quantity than in earlier nuclear power stations) which could be looked into for possible use here. Nuclear energy is of course emission friendly, which might be another reason why some people would be looking at this method given the current beliefs concerning global warming.

(b) Liquefied natural gas

Has to be brought into Wales by tanker, and has limits to its supply. It may get more expensive as third-world countries develop and require more energy; but nearby gas fields are thought to exist off the south and west coast of Ireland and may offer opportunities for other methods of transportation. However, large areas of Wales are unable to access a supply, and the new facilities at Milford Haven require land transportation across Wales (of small benefit to Wales).

(c) Clean Coal Technology

Originally a British project, and progressed to the tested stage, which on disbandment of the Coal Board was shelved. I took this up with Martin Caton MP last year; and he has all the references to this, and asked questions in the House. It certainly has a role to play, even in this country where the use of coal has declined so much.
(d) Wind farms

Wind is the most expensive method of generating a meagre, intermittent and unpredictable supply of electricity. The ROC system results in all consumers paying for the marketing of the ROCs on the open market at five or six times the cost of normal electricity (DTI Energy White Paper). The “retired ROC” scheme is another way in which energy costs have been artificially inflated. Companies can claim tax relief of up to 125% on some costs associated with building and maintaining wind turbines. These include staff costs and any spending on ways to make the wind farm perform more quietly or generate more electricity (which is a disincentive for companies to get it right when they are first erected—for example the months and months of trouble after opening at Causeymire Windfarm, Caithness).

The amount of electricity capable of being generated is consistently exaggerated by wind companies. Now that figures are being measured for actual generation it can be seen to be a lot less than claims often repeated by the BWEA. (For example, the DTI 2005 Digest of UK Energy Statistics gives the load factor for on-shore wind in table 7.4 as 26.6%; only slightly up from 24.1 for 2003.) Apart from the 24.1%, this is almost the lowest load factor ever recorded; and it is likely to gradually fall as “poorer” sites have to be utilised; probably levelling at around 20% as in Denmark, and probably in SE England at about 15% as Germany.

This is a far cry from original estimates of 40%—and even now 35% is still being quoted.

The UK’s plans to derive a fifth of its energy from renewable sources (some 20 gigawatts) by 2020 have been rebutted by Hugh Sharman, principal of the energy consulting and brokering company Incoteco in Hals, Denmark, who argues that the UK’s energy grid will not be able to handle more than 10 gigawatts (Proceedings of the Institute of Civil Engineering, vol 158, p 161). He states that the problem is that the wind doesn’t blow when we most need electricity, for example in cold still winter anti-cyclones, and on hot still days in summer. Typically turbines start generating energy at wind speeds of 4 metres per second and reach full capacity at 14 meters per second. They shut down again at around 25 metres per second to protect the drivetrain and gearbox.

Even on wind industry figures, 25 gigawatts of wind-power capacity in the UK grid would displace around 5 gigawatts of conventional generating capacity, such as coal-fired or nuclear power plants.

Germany’s turbines, which have a capacity of 17 gigawatts or 14% of the total energy demand, shut down so frequently that averaged over a year they only generate around 15% of their notional capacity.

Earlier this year (January 2005), Wolfgang Clement, the German Social Democratic Economics Minister, citing an unpublished study by German energy agency Dena, warned that German costs for including wind power into their Grid could increase four-fold by 2015, from 1.4 billion Euros to 5.4 billion.

The 16 page Wind Report 2004 by E.ON Netz GmbH (who are responsible for the electricity transport grid of the E.ON Group, and are one of the main electricity grid operators in Europe covering one third of Germany) paints a gloomy picture of the ability of the Grid to cope with any increase in wind energy. It contains tables showing the strong fluctuation in wind power infeed (Table 4) and the minor contribution of wind power during (Table 6) the 2003 heatwave, and (Table 7) during midweek peak load.

It states that:

“The experience of the past year has shown that whenever electricity consumption was comparatively high because of the weather, namely during cold wintry or hot summer periods, wind power plants could make only a minor contribution towards covering consumption.”

“In order to also guarantee reliable electricity supplies when wind power plants produce little or no electricity—for example during periods of calm or storm-related shutdowns—traditional power station capacities must be available as a reserve. The characteristics of wind make it necessary for these ‘shadow power stations’ to be available to an extent sufficient to cover over 80% of the installed wind energy capacity. This means that due to their limited availability, wind power plants cannot replace the usual power station capacities to a significant degree, but can basically only save on fuel.”

“Large quantities of electrical energy cannot be directly stored. This means that every second, exactly the same amount of energy must be fed into the grid that is taken out at the same time. If the amount fed in differs from the amount tapped, this can cause faults or even failure of the supply—as confirmed in 2003 by the widescale power failures in the USA, Italy, Sweden and Denmark.”

“Wind energy leads to regional price distortions—even load distribution overdue. The result of this is a higher grid utilisation cost burden in the ‘windy’ areas.”

“Even more serious is the fact that wind power plants of the usual type have so far disconnected themselves from the grid even in the event of minor, brief voltage dips, whereas large thermal power stations are disconnected only following serious grid failures.”

“Even today, the failure of wind power generation in the event of grid problems is barely possible to master via system technology.”

Germany is many years ahead of the UK and most other countries in developing wind energy—and is now obviously having considerable problems. We should learn from their expensive mistakes and call a halt to the development of any further wind power stations in Wales or the UK. They are not the answer to our
energy needs, and do a great deal of environmental and social damage for a meagre return. Photographs of damage to peat areas during construction of these massive structures show irreversible damage; as for example do the Minutes of the Cefn Croes Wind farm Environment Committee charged with monitoring the reinstatement after construction. The divisive approach used by companies to attempt to get local communities to back development proposals will fester in rural areas long after these structures are superseded. Wales has a large investment in tourism, beautiful scenery and a strong rural heritage and cooperative communities. All these are damaged by wind farm developments.

We should not be giving this up for the sake of an expensive method of not meeting England’s energy needs.

(e) Bio mass energy

The main problem is the large amount of land required for a relatively small return in energy terms. There are other environmental issues, particularly with alien crops like Miscanthus which are not biodiversity-friendly and tend to sterilise an area whilst the crop is under growth. Also of disease—a monoculture of willow for example is prone to rust attack. There may be a case for small stands of mixed tree coppice, but the traditional uses of forest crops would seem to be more appropriate than large-scale growth harvested mechanically which would be necessary if bio mass would be able to give an economic return.

(f) Geo-thermal energy

I am not sure if there is any true geo-thermal energy accessible in Wales (unlike Hampshire, for example). However, there may be a place for soil-pipe heat exchange particularly in relation to new build. But this seems likely to be small.

(g) Tidal and wave energy

These are two very different forms of energy: wave energy depending on wind and thus being subject to the same problems of fluctuation, unpredictably and expense. Experiments so far have not been favourable and it seems not a viable prospect for the near future.

However, tidal energy is different, particularly tidal lagoons (as opposed to barrages across rivers and estuaries which have several environmental problems). Tidal lagoons are capable of giving very useful amounts of predictable energy and operate both on in-coming tides and on outgoing ones when the water in the lagoon exits the lagoon through the (protected) turbines. They are comparatively unobtrusive being only about a meter above high water, and can add habitat to an area, and opportunities for developments within the lagoon, such as lobster farming. The lagoons are very long-lasting and can continue for at least 100 years with only minor refurbishments.

Details of a proposal for an energy-generating tidal lagoon in Swansea Bay can be found in a Report by WS Atkins (2004), backed by Tidal Electric, the Environment Trust and Swansea Harbour Board.

(h) Hydro electric energy

This has been operating in Wales for very many years and is largely trouble-free. The great majority of renewable energy in the UK comes from hydro-electricity. There would be little opposition to expansion on a small scale, but considerable resistance if it involved flooding any further valleys. I do not know if it would be viable to build hydro-generation into existing structures that do not have it.

I note that solar power does not get a mention in the portfolio, although it figures in government schemes like Clear Skies. Whilst it might play a part in new build and small-scale on the spot generation, it would perhaps make little addition to total energy generation. Energy Saving Measures would maybe contribute more; but this aspect is also not included.

December 2005

Written Evidence from Airtricity

1. INTRODUCTION

The Welsh Affairs Committee has invited organisations and members of the public to submit memoranda setting out their views on this inquiry. This submission concentrates on the framework required to enhance the development of onshore wind in Wales, and suggests changes that could be implemented to promote the timely development and construction of onshore wind. It is structured as follows:

— Section 2 briefly discusses the requirements for the continued expansion of onshore wind.
Section 3 sets out views on the policy issues affecting wind resource development in Wales.
Section 4 examines the viability of the current targets.
Section 5 provides a summary of the paper.

2. Onshore Wind

The Energy White Paper16 of February 2003, set out a vision in which renewables and energy efficiency would play a key role in UK energy policy and secure the gap left by the decline of current nuclear and coal generating capacity. It is against this background that the renewables sector in general, and the wind industry in particular, has been evaluating its investment plans and project development strategies.

The stability of the current renewables framework has enabled onshore wind to make a major contribution towards government targets, benefit from technology and cost improvements, and develop an overall infrastructure to support continued development.

Uncertainty regarding the Government’s intentions towards new nuclear capacity, triggered by the recently announced Energy Review, has the potential to damage further investment in renewables and energy efficiency. Equally, potential changes to the current government and regulatory frameworks to facilitate new nuclear build need to be fully thought through, with regard to both their direct and indirect impact on the renewables sector. Onshore wind is a success story for the UK and has delivered significant benefits. Given the appropriate framework, it can deliver much more. Although not a completely mature sector, onshore wind experience is such that the government is well informed with regard to the likely path of cost curves for the industry, as it develops further. A potential key concern for current and future development will be the coordination, efficiency and timeliness of the overall planning process. Consideration should be given to reviewing the framework applicable to wind project planning, such that each development only has to address truly significant, specific issues. If planning develops on a case-by-case basis, where no “case law” is laid down, and all issues are reopened each time, it is highly likely that the pace of onshore wind resource development will slow significantly.

3. Policy Issues

In supporting the Government’s energy policy objectives, it is important that there are no inconsistencies between the frameworks for UK and regional government. The challenges of climate change, and the UK government’s response to these, need to be met in a coordinated and consistent manner, in order to facilitate continued confidence within the renewables industry. The strategy to meet UK objectives is best developed within a UK wide framework.

A key UK wide issue is that of greater certainty with respect to the renewables market post 2015–16. This could be achieved either by increasing the Renewables Obligation post 2015 (to say 20.4% by 2020–21) or by guaranteeing a margin post 2015–16 between the renewables obligation and renewables supplied to avoid the cliff-edge.

With regard to Welsh Energy issues, clarity is required as to the extent to which responsibility for policy development to support those strategies rests with Westminster and the devolved Welsh Assembly. The situation is complicated further when the final and most important step, that of implementation, is considered. Where responsibilities for implementation between different Agencies, Authorities and bodies are unclear or potentially in conflict, the process of development is compromised.

Energy Policy in Wales largely rests upon the findings of the Welsh Assembly Government Economic Development Committee Review of Energy Policy in Wales: Part 1 Renewable Energy (2003). The six key recommendations of the review frame the relevant issues concerning the division of powers regarding energy, renewable energy targets, and the requirement for specific policy initiatives from the Assembly.

With regard to renewable energy and facilitating the targets set for 2010, the most significant devolved power has been planning policy. The relevant policy in this area is “Technical Advice Note 8—Planning Policy Guidance for Renewable Energy”.

Onshore wind will be the key component in meeting the 2010 targets. The pace of wind farm development will largely depend on the efficiency of the planning policy, and its implementation, in facilitating development.

In 2001 studies were carried out to quantify the Welsh Renewable Energy Resource in order to inform the Welsh Assembly Economic Development Committee (EDC) Review of Energy Policy in Wales (Jan 2003). The report estimated a long term potential, taking account of technical, economic and environmental constraints, in the region of almost 12TWh electricity and 5TWh heat.

The original assumption by the Assembly was based on an approximately equal split between onshore wind, biomass and “other” renewable electricity technologies. This was subsequently revised, giving onshore wind a greater role, following further investigation into the economics of biomass electricity production.

These assessments underpinned a number of EDC recommendations including a proposal (Recommendation 2) to adopt targets for Welsh renewable energy generation for 2010 and 2020. Crucially, the Recommendation contained the following statement: “In order to promote these targets the National Assembly should seek information from all Local Authorities on the contributions that they consider could be made to meeting such targets from within their areas.”

The Welsh Assembly subsequently chose to adopt a target of 4TWh of electrical production by 2010, together with an aspiration of 7TWh by 2020. This was at the high end of the range of potential targets specified within the EDC report.

Within the framework of devolved powers relating to energy policy, the National Assembly were constrained in the choice of mechanisms within which to pursue the target. Planning policy provided one mechanism, and this was recognized by Recommendation 5 of the EDC:

“The National Assembly should:
(a) as a matter of urgency, seek ways to clarify and streamline the planning process for renewable energy developments;
(b) seek an extension of its powers with regard to the approval of power generation facilities;
(c) find mechanisms whereby renewables developments can provide immediate and tangible benefits to the local communities in which they are located.”

3.1 Technical Advice Note 8 (TAN 8)

Whilst TAN 8 includes a target of 200MW installed capacity for offshore wind and other renewable technologies, it is primarily focused on the delivery of onshore wind capacity. The TAN specifies seven Strategic Search Areas (SSAs) within Wales. These are the preferred locations for large scale wind energy developments. A key element in the development of these SSAs is the involvement of the Forestry Commission, who manage approximately 56% of the land area within them.

The approximate capacity of each area has been estimated, and on this basis a target figure of 800MW of onshore wind has been established. The effect of the policy and definition of the SSAs leads to a de facto maximum area available for large wind farms, which face less likelihood of success outside the SSAs. Local Planning Authorities are tasked with further “refining” the SSAs within their areas.

This approach differs from that established for England through PPS22, which uses a criteria based, rather than geographic approach. It has focused development effort on the SSAs, in the expectation that viable projects will be facilitated.

4. Viability of the Targets

The target for 2010 is 4TWh per annum of electrical energy. Assuming a capacity factor of 30%, then 800MW of installed wind capacity would produce some 2.1 TWh of energy. The assumed 200MW of other renewables is unlikely to be operating at 100% load factor and thus the target of 4TWh per annum appears unachievable.

Further, the policy itself, by constraining major wind development to the SSAs, risks undershooting on the level of installed wind capacity for 2010.

Using a criteria based approach, similar to England, would have allowed developers the maximum freedom to seek out and develop suitable sites.

The seven SSAs have their own specific constraints which will hinder large scale development. In particular, extensive forestry, site access and slope gradient appear to render the current Nant y Moch area impractical for large scale wind farm development. These and other constraints such as the restrictions imposed by NATS radar have not been fully considered in assessing the potential of the SSAs and are likely to constrain the level of achievable capacity within the SSAs to below the 2010 target.

Consideration should be given to extensions to the seven SSAs. Additional designated areas would also significantly ease development pressure and increase the likelihood of meeting the 2010 target. This might be achieved by the use of “conditional strategic areas” which would be suitable for major wind farm development where specific conditions can be satisfied. This would ensure that significant areas for wind farm development are not being excluded due to the location of sometimes small designated sites or areas. Technical solutions exist to many of the perceived constraints such as telecommunication masts and re-broadcast links. Similarly, with regard to SSSIs, nature and bird reserves the constraint is site specific and depends on whether the renewable energy development would compromise the purpose of designation. A specific example is that of Area D, Nant y Moch, which currently excludes a potentially suitable area between its South Western boundary and an existing wind farm development.
The main technical barrier to reaching the TAN 8 capacity targets by 2010 will be grid availability and capacity. The SSAs were selected without proper consideration of the necessary level of Grid reinforcement (and the time to reinforce) that would be required to connect the target MW capacity. Upgrading the grid infrastructure is likely to impose a time lag of between five and eight years in five SSA areas (Brechfa Forest, Nant y Moch, Llandinam, Carno, Clocaenog Forest).

Efforts should therefore be made to reduce the lead in times for additional 132kV lines, to support the 800MW target. Failure to strengthen the grid in a timely manner will render major developments unviable, the strategic search area approach invalid and the materially compromise the achievability of the 800MW onshore target.

Wind farm development within mature forestry carries many additional complications and is an immature area with regard to available data and experience. Due to the additional risks and complexities, heavily forested areas have not been a primary choice for wind project developers. Over 50% of the SSA area is within forestry, and whilst the precise impact is unquantified, the likelihood is that the higher turbulence in forested developments will result in additional costs and lower outputs per installed MW, compared with non-forested sites.

4.1 Process and co-ordination issues

It was noted above that the majority of the SSAs fall within Forestry Commission responsibility. Despite this, consultation and coordination between the Assembly and the Commission has not been as effective as it might have been, with the Forestry Commission only being included in the process at a relatively late stage. This has resulted in resourcing problems at the Commission, who are dealing with the practicalities of the incorporation of numerous major developments within existing long term forestry planning processes.

The timetable set out by the Assembly has been subject to considerable delay. Without a clear deadline to deliver, the process may be further impeded by any slippage by local planning authorities, both in terms of “refining” SSA areas and in dealing with the large number of applications linked to SSAs. The impact of this process shortfall can lead to planning decisions being delayed for more than two years.

5. Summary

5.1 In supporting the achievement of the Government’s energy policy objectives, it is important that there are no inconsistencies between the frameworks for UK and regional government.

5.2 In order to promote a long term approach in line with UK Government energy policy, firm targets for renewable energy in Wales for 2015 and 2020 are required, in addition to those for 2010.

5.3 The use of a strategic geographic approach, characterized by TAN 8, rather than a broader criteria based approach, has implications for the development of renewable energy in Wales. The adoption of seven SSAs for large scale onshore wind projects has the potential to unnecessarily constrain renewable development and risks achievement of the 2010 targets.

5.4 Given the experience of implementation so far, urgent action is needed to meet the 2010 target and 2020 aspiration—this applies not only to construction and commissioning but to planning processes and consents, grid capacity and connections.

5.5 The 2010 target is unlikely to be met solely by developments within the existing seven strategic search areas (SSAs). Stakeholders need to work with the Assembly to identify alternative and additional options to ensure the targets are met.

5.6 Within the current framework, there is a need to ensure consistency between the various stakeholders at national, regional and local levels, to ensure that viable projects are facilitated in a timely manner.

5.7 Local Planning Authorities need to be firmly aligned with the objectives and policies of the Assembly, in order to facilitate progress. Clear, criteria based local planning policy should guide wind turbine location at a local level, particularly outside the strategic search areas. Failure to encourage appropriate wind farm developments of all sizes in wider areas than the SSAs heightens the significant risk of missing the 800MW onshore wind target.

5.8 A key requirement for all major renewable electrical energy projects is the availability of sufficient Grid connection and transmission capacity, in a timely manner. The proper integration and coordination of grid reinforcement in Wales is an essential part of overall Energy Policy and must be addressed.

2 December 2005
Written Evidence from Denbighshire County Council

INTRODUCTION

The paragraphs below highlight some of the key areas of recent work by Denbighshire County Council with regard to the provision of renewable energy.

CONSULTATION DRAFT TAN 8

Denbighshire County Council responded to the Consultation Draft TAN 8 in October 2004. The comments were that of broad support to the principles of the TAN ie addressing this key but difficult area of sustainable development through making positive provision through the Strategic Search Areas (SSA) for wind power at a national level. However we also raised some concerns as follows:

— There was little justification or consultation of the renewable energy targets set—how did the Welsh Assembly Government arrive at 4TWh renewable energy target and the 800MW on shore wind energy capacity targets? (these were apparently non-negotiable during the consultation of TAN 8).
— It did not explain or justify the contribution from other renewable energy sources;
— The “presumption in favour of development” implied throughout the TAN required further clarification;
— There was uncertainty regarding how to deal with planning applications outside the strategic zones;
— There are concerns regarding the method of proposing the strategic zones, particularly as there is no public inquiry (which will eventually have to be incorporated into county development plans) because this essentially removes or certainly weakens local democracy;
— Too much emphasis on wind power and not enough on other “alternative” methods of energy production.

The full version of Denbighshire’s response is attached in a separate Appendix.

FINAL DRAFT TAN 8 (JULY 2005)

On publication of the approved TAN 8, some but not all of the County Council’s concerns had been addressed. The TAN reduced the size of the Clocaenog Forest SSA from 200MW to 140MW. It allowed limited local discretion in determining which sites should come forward by recommending “local refinement” exercises to the SSA.

A partnership approach was formed between Denbighshire County Council and Conwy County Borough Council (the SSA falls within both counties) who jointly commissioned Arup consultants to look closely at landscape issues, biodiversity, technical feasibility etc of the SSA in order to try and determine the preferred areas within the SSA for wind turbines.

The results of this study will eventually form Supplementary Planning Guidance for both Denbighshire and Conwy.

THE ARUP STUDY

The Arup “SSA Refinement Study” is now almost complete—some additional work on biodiversity is currently being done. It has refined the SSA boundary, although the suggested capacity of the SSA is such that a large proportion of the SSA will need to be developed in any case.

THE JOINT DENBIGHSHIRE—CONWY WIND FARM SPG

This SPG has been drafted and scrutinised by both Denbighshire and Conwy Environment Scrutiny and approved for public consultation by delegated Cabinet decision in Denbighshire and full Cabinet in Conwy. However formal consultation has not yet commenced. This is because biodiversity issues are being re-assessed in the Arup report although it is anticipated that these issues will have been resolved by the end of December 2005.

FUTURE TIMETABLE

Denbighshire County Council and Conwy County Borough Council propose to consult the SPG during January and February 2006. It will be fully approved by April 2006. The refined SSA boundary will also be incorporated into the emerging Denbighshire Local Development Plan Proposals Map.
SECTION 36 ELECTRICITY ACT

Another issue of note is that applications over 50MW are determined under Section 36 of the Electricity Act by the Department of Trade and Industry and not by the local planning authority. A LPA can force a public inquiry if it objects to such applications. Local Councillors have raised concerns over the implications of this Act upon local democracy.

PROMOTING EFFICIENT USE OF ENERGY

Not enough focus is put on promoting more efficient use of energy by controlling new development, grant aiding innovation in building design that conserves energy or uses “alternative” energy, not enough resources allocated to Local Government to actively promote energy efficiency across the wide spectrum of responsibilities.

December 2005

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Written Evidence from National Grid Plc

INTRODUCTION

1. The National Grid plc (National Grid) owns the electricity transmission network in England and Wales, and operates the electricity transmission system throughout Great Britain via its subsidiary company National Grid Electricity Transmission plc. National Grid also owns the gas transmission network and four of the eight gas distribution networks throughout Great Britain, under its subsidiary company National Grid Gas plc.

2. National Grid has statutory duties to build, develop and maintain efficient, co-ordinated and economic networks and facilitate competition in the generation and supply of gas and electricity. Our licence prohibits us from discriminating between parties who make use of the electricity transmission and gas transmission and distribution networks. To help meet our responsibilities we provide transparent information on the charges for using our networks, its capability and characteristics, including opportunities for future use, and, guidance to anyone who wishes to connect. We also balance the gas and electricity markets. In the case of electricity, this is done in real time, ensuring that demand and supply are equally matched on a second by second, day by day basis.

GAS TRANSMISSION

3. National Grid Gas plc, is the licensed public gas transporter and owner and operator of the National Transmission System (NTS) in Wales, England and Scotland.

4. The NTS is a buried pipeline system which transports gas at high pressure, from coastal reception terminals to points of supply and the regional gas distribution systems.

5. Within Wales, National Grid currently has 125.7 kilometres (79.3 miles) of NTS pipeline.

GAS DISTRIBUTION

6. Since June 2005, gas distribution in Wales, has been owned and operated by Wales & West Utilities, part of Macquarie Investment Management (UK) Ltd. National Grid continues to provide the emergency call handling from within the distribution area. The emergency number for any gas incident is 0800 111 999.

WELSH GAS REQUIREMENTS

7. Between 1994 and 2004 annual gas demand in Wales rose from 34 TWh to 44 TWh, an average growth rate of 2.6% per annum. Wales has a large proportion of non-domestic demand relative to Great Britain as a whole (52% of distribution network demand in 2004, compared to 41% for Great Britain as a whole).¹

8. Annual gas demand in Wales is forecast to rise from 44 TWh in 2004 to 52 TWh in 2014, an average growth rate of 1.7% per annum.²

¹ National Grid 2005 10 Year Statement.
² National Grid 2005 10 Year Statement (excluding shrinkage on a 17 year seasonal normal basis).
Electricity Transmission

9. National Grid Electricity Transmission plc, is the electricity transmission licence holder and owner operator of the high voltage electricity transmission system in Wales and England, which operates at 400,000 volts (400kV) and 275,000 volts (275kV).

10. As System Operator for Great Britain, the Company’s role extends to operating the GB Transmission System. The primary function of the transmission system is to transport electricity in bulk between generators and the lower voltage Distribution Network Operators (DNOs) or major electricity users with direct connections, such as steel works and smelters.

11. As electricity cannot be stored in bulk and as GB System Operator, it is National Grid’s role to ensure that the balance of generation matches demand in real time.

12. Within Wales National Grid currently has 893.7 circuit kilometres (555.1 miles) of overhead line, 32.5 circuit kilometres (20.2 miles) of underground cable, and 26 substation compounds.

Electricity Distribution

13. Electricity distribution in Wales is operated by two companies—Western Power Distribution (WPD) which covers the southern half of Wales and SP Manweb (SPM) which operates the system over the remainder of Wales, plus parts of Cheshire and Merseyside.

Welsh Electricity Requirements

14. Between 1993–94 and 2003–04, electricity demand met via the WPD network increased from 11 TWh to 13 TWh, i.e. average growth of 1.7% per annum. Over the same period, however, demand in the SPM distribution area fell from 18 TWh to 17 TWh.

15. National Grid forecasts electricity demand met via the WPD network to increase to 15 TWh by 2013–14, an average growth rate of 1.4% per annum and electricity demand met via the SPM network to increase to 18 TWh by 2013–14, an average growth rate of 0.6% per annum.

Network Investment

16. National Grid has a licence obligation to invest in the electricity transmission network in an economic and efficient manner, and as a regulated company, we can only recover costs deemed efficient by Ofgem. For this reason we can only undertake network investment to facilitate generation connections in response to appropriate signals from the market i.e. when generators make firm financial commitments to underwrite the costs of the network connections required. To remove network constraints and reinforce the system where there is no direct trigger from a new generator, Ofgem’s explicit support is required and we need to demonstrate that these costs are economic and efficiently incurred.

17. To facilitate competition we seek to meet the connection dates requested by generation developers. The lead time for network infrastructure projects is dictated by a number of factors, such as land and planning consents, availability of supply chain resource and outage sequences required to ensure that the network is operated to agreed security standards. However, these factors can mean that projects for new network capacity may take a number of years from the date of signing of a contract for network connection to the availability of capacity for that generation project.

18. Where generation wishes to connect to a part of the network where there is little or no spare capacity and high levels of congestion, there will be additional costs to upgrade the network and provide additional capacity. In our Seven Year Statement we identify areas where bottlenecks exist and where there is little or no spare capacity available to accommodate new generation or demand. This provides potential users of the network with information concerning the opportunities to use the networks without needing to wait for further reinforcement.

19. To ensure that the system maintains current levels of reliability, projects to connect new generation have to be managed in conjunction with ongoing maintenance, replacement and upgrading works.

20. In order to ensure that generation is encouraged to locate in the most efficient location, Ofgem has required National Grid to put in place a transmission charging regime which does not encourage or discriminate against any particular generation technology, but which, as accurately as possible, reflects the costs of serving generation and demand in different areas. These charges provide an incentive for new generation plants to locate nearer to the largest demand centres and thereby reducing the amount of the investment required for new generation projects to connect to the transmission network.

3 Electricity Industry Review.
21. National Grid publishes statements, agreed by Ofgem, of charging every year which illustrate what the cost of connection could be and what the ongoing charges for use of system will be. These financial costs will be taken into account by new generation projects on making decisions on location, as well as other factors, such as the likelihood of necessary planning and consents and the availability of suitable sites with any necessary natural resources.

22. National Grid is required by the Gas Act 1986 (as amended) to “develop and maintain an economic and efficient pipeline system”. When determining the optimum reinforcement strategy to meet supply and demand growth in the UK, National Grid considers what may be required for future developments up to 10 years ahead in order to minimise the long term cost of providing both entry and exit capacity. This “strategic” analysis is a critical requirement in demonstrating that National Grid’s development proposals represent an efficient and economic solution.

23. Through an Ofgem-regulated annual auction process, gas shippers signal their capacity requirements to supply gas, at their chosen entry points, to National Grid. National Grid is then obliged, as a licensed Gas Transporter, to release the entry capacity that has been signalled. To comply with its gas transporter licence, National Grid must therefore provide additional gas transmission capacity to move gas to the areas of demand within the UK.

**Planning Consents**

24. Before National Grid can construct new gas or electricity transmission infrastructure and in some cases before we are able to replace existing assets, due planning processes must be followed and necessary consents obtained from the relevant bodies. Some of the key approvals required for new gas and electricity transmission infrastructure works are as follows:

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Consent Requirement</th>
<th>Consenting Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas Above Ground</td>
<td>Planning permission (Town and Country Planning Act 1990)</td>
<td>Relevant Local Planning Authority</td>
</tr>
<tr>
<td>Installations/Electricity Substations</td>
<td>EIA Consent (the Public Gas Transporter Pipeline Works (Environmental Impact Assessment) Regulations 1999)</td>
<td>Secretary of State for Trade and Industry</td>
</tr>
<tr>
<td>Gas Transmission Pipelines</td>
<td>Integrated Pollution Prevention and Control or Pollution Prevention and Control Permit (Environmental Protection Act 1990 and Pollution Prevention and Control (England and Wales) Regulations 2000)</td>
<td>Environment Agency Wales</td>
</tr>
<tr>
<td>Overhead Electricity Lines</td>
<td>Section 37 Consent (the Electricity Act 1989)</td>
<td>Secretary of State for Trade and Industry</td>
</tr>
<tr>
<td>Gas Compressor Stations</td>
<td></td>
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</tbody>
</table>

25. As a responsible business, National Grid is entirely committed to complying with due planning processes and to adopting “best practice” approaches in the way the Company goes about fulfilling that commitment.

26. It should, however, be recognised that a challenge frequently faced by energy infrastructure projects is that they can have the potential to become protracted, being influenced by local issues, which may not attach appropriate weight to the wider benefits afforded by the projects.

27. When we need to plan new transmission infrastructure or refurbishment of the existing networks, National Grid undertakes early consultations with a wide range of relevant statutory and non-statutory bodies, landowners and the public. Within Wales the key statutory bodies include the Countryside Council for Wales, Cadw, Environment Agency Wales, Archaeological Trusts, Local Planning Authorities, the National Trust, Civil Aviation Authority and Ministry of Defence.

**Current Gas and Electricity Transmission Infrastructure Projects in Wales**

28. National Grid is currently engaged in a circa £600 million investment programme delivering a series of significant gas transmission system reinforcements required to connect two new Liquefied Natural Gas (LNG) terminals that are being built at Milford Haven by South Hook LNG and Dragon LNG. On completion, these new LNG terminals are forecast to have sufficient capacity to provide circa 20% of future UK gas supplies.

29. Plans are in place to allow 22 to 32 billion\(^4\) cubic metres of gas per year into the NTS via the Milford Haven terminals. Historically, South Wales has been at the extremities of the NTS, where the existing pipelines are mostly single 600mm diameter pipelines operating at 70 and 75 bar gauge pressure installed in

\(^4\) Present South Wales market demand for gas is 3.25 billion cubic metres per year.
the 1960s and 70s. The existing infrastructure will require upgrading and extending to accommodate the gas supplies that will come from the Milford Haven LNG terminals, as presently the network extends to just North of Swansea.

30. Through a gas capacity auction process it was signalled that National Grid must provide additional gas transmission capacity totalling 650 Gigawatt Hours per Day (GWh/d) by October 2007 and 950GWh/d by January 2009.

31. To provide this additional capacity, new reinforcement pipeline sections and compressor station works are needed by 2007–8 in addition to the new 120 km connecting pipeline between the Milford Haven LNG terminals and the existing NTS near Aberdulais. An application for consent to build the first stage, the connecting pipeline between Milford Haven and Aberdulais, was submitted to the Secretary of State for Trade and Industry in April 2005. An application for consent for the subsequent 186km section of reinforcement pipeline between Felindre, near Swansea and Tirley, in Gloucestershire, along with a planning application for a new compressor station at Felindre will be submitted around March/April 2006.

32. By engaging in a comprehensive consultation process with key statutory bodies, we have identified a preferred pipeline corridor for the Felindre to Tirley section which best balances the range of construction, health and safety and environmental considerations that need to be taken into account. A number of factors will influence the successful and timely delivery of these nationally important infrastructure works. Firstly, National Grid will need to engage positively with key stakeholders and ensure that the potential environmental impacts of the works are minimised as far as is reasonably practicable. Secondly, the cooperation of consenting authorities will be required in accepting the wider national benefits and working constructively with us on siting issues and minimising potential impacts.

33. RWE npower has applied for statutory consent for a 2,000MW CCGT power plant at Pembroke. Milford Power, a subsidiary of Petroplus, has also applied for consent for a 1,600MW CCGT power plant at Waterston near Milford Haven.

34. To enable the connection of these two power station projects National Grid is engaged in carrying out works which include the building of new and refurbishment of: existing substations at Pembroke, and the overhead transmission line that runs between Pembroke—Swansea North—Merthyr Tydfil. Substation investment will approach £70 million, with overhead line work costing in the region of £42 million.

35. In addition to the above works, National Grid will be undertaking a further £20 million of overhead line refurbishment work, commencing next year, and due for completion in September 2006.

FUTURE DEVELOPMENTS

36. National Grid is a long-term investment business and recognises the aspiration for Wales to establish a renewables base. As yet there are currently no onshore wind farms within Wales, with direct connections to the National Grid transmission system.

37. National Grid must have appropriate signals from interested electricity generators, before any investment in such areas can be triggered.

38. Additional investment to build or re-enforce high voltage transmission lines may well be required if significant levels of onshore renewable energy sources were to be connected in Wales (as advocated in TAN 8). This is due to the fact that areas rich in renewable resources, such as Mid and West Wales, are often located away from the main transmission network.

39. As identified in the Royal Commission on Environmental Pollution report of 2000, distributed CHP generation has been identified as having the potential to make a significant contribution to Britain’s fuel mix in the future. Most of the new CHP units needed to meet the Government’s targets are likely to have small generating sizes and so will find it most cost-effective to be embedded within the low voltage distribution networks. Generally, we expect an increasing proportion of embedded generation to reduce the flow across the interfaces between the electricity transmission and distribution networks, but it is unlikely to remove the need for the substations at these interfaces. These will continue to be needed to balance the fluctuation between generation and demand in specific parts of the distribution network from minute to minute in order to maintain security of supply.

40. In addition National Grid also excepts bulk energy transfers to continue, or increase, as electricity from remote wind, tidal or wave power must be carried to demand centres. Our analysis of the Royal Commission, as well as our own scenarios, shows that the requirement for transmission will be at least as large as the present infrastructure and may need significant expansion for certain scenarios, as generation adapts to deliver the target carbon reductions by 2050.

December 2005
Written Evidence from Community of Llanfyndd Against Wind-Power Stations (CLAWS)

We understand that the Welsh Affairs Committee is conducting an inquiry into energy in Wales. We would like to submit for your consideration our experience of the community divisions which can be caused by land-based wind power stations.

CLAWS is a community based group of over 250 individuals who are opposed to the development of a wind farm by a Spanish company which would surround our small, rural village. Although only in the pre-planning stage, this proposed development has already profoundly affected our village and surrounding area. One of the most unpleasant consequences has been the divisions which have been created.

There has been significant secrecy as to the nature of the proposal. Residents only learned by accident that an application for a wind monitoring mast was being considered by our community council. As too many council members have an interest in the proposal, our community is left without representation at a local level. The issue has led to great acrimony and a loss of confidence in the ability of our community council to fairly represent the views of the majority. The depth of the division can be demonstrated by a recent by-election for a community council vacancy. Not for over 20 years has a seat ever been contested, but a turnout higher than that of the general election was achieved.

A public meeting degenerated into bitter recriminations between some of the landowners who would financially benefit and remaining residents. Statements included, “You are English and a newcomer—you have no right to tell us what we do with our land”, “I have just put my house on the market to move closer to my family—it will never sell now”.

The farming community is split over the issue. While most family farms have suffered a substantial drop in their income over the last few years, and to many a wind farm development could be a financial lifeline, the development would only benefit a minority, further increasing financial inequities. Neighbours who have never have fallen out now do not speak to each other. In fact, there is evidence of un-neighbourly practices such as opening gates to let farm stock onto the road, blocking of culverts etc.

The church and its school have made the decision to remain neutral on the issue, while the decision of the chapel to allow the developers use of their premises for an information evening has been criticised by many.

The threat of division within communities is a very real cost of a policy which promotes large scale land-based wind power. Please consider this issue in your inquiry. We are willing to send a representative to London to personally address the Committee. Should you be unable to accommodate us, please at least allow the All Wales Energy Group to speak on our behalf.

29 November 2005

Written Evidence from Peter and Carol Roberts

The So Called “Rhyl” Flats Offshore Wind Farm Objection

The reason why we are writing is to make this representation is because of a misrepresentations that give the impression that “Rhyl Flats” Offshore Wind Farm project is off North Wales Coastal Town of Rhyl which is 20 miles east of Llandudno, Rhos-on-Sea and Colwyn Bay where we live. In fact these turbines shown on N.power map now shows these 30 x 500ft high offshore wind turbines on the marine area called “Constable Bank” which is located in front of the Bay of Colwyn directly in front of where we live some distance from the marine area called “Rhyl Flats”.

Either the location has moved since the first application in 2000 by Celtic Offshore Wind Limited (COWL) or the proposed site given the name “Rhyl Flats” to mislead the general public and the DTI!

COWL claim in their Environmental Impact Audit (EIA) that there will be no impact on tourism and that the industrialised landscape which will result from their endeavours will attract tourists. This is a misleading statement as hundreds and thousands of tourists visit our year each year for its beauty.

The North Wales Coastline has already 30 x 300ft high offshore wind turbines call “North Hoyle” located off the coast of Prestatyn, some 5miles off Prestatyn Town and are 14 miles off our heritage coastline of Llandudno, Rhos-on-Sea and Colwyn Bay and they currently intrude upon our bay on clear days, worse still the proposed above development in its moved position at “Constable Bank” will have turbines 50% higher (500 feet and higher than Blackpool Tower) than the North Hoyle and will be only 4.5 miles off the Colwyn Bay and Rhos-on-Sea shore line, this movement from “Rhyl Flats” to “Constable Bank” is totally unacceptable and we demand a public enquiry on this matter. The well-established residential areas of Rhos-on-Sea and Colwyn Bay and Tourists town of Llandudno will be adversely affected by this development—one (1) Blackpool Tower maybe acceptable, but certainly not thirty (30).

The risk assessment also covers sea life and to some extent bird life, however their assessment does not cover the visual and tourist impact in any great detail by Npower. Another disturbing thing in their risk assessment is their avoidance of any in depth analysis of the possible impact of massive and unprecedented
engineering works on and around a natural marine sandbank, namely the “Constable Bank”, this feature provides a natural wave break when the sea is stormy. It is part of our natural flood defences and the project will spoil our town and its breathtaking and unique sea and mountain setting.

We look forward in you re-examining of the COWL/Npower submission and its misrepresentation within and request you either cancel this granted permission or relocate not to spoil our beautiful landscape.

Gwynt y Mor Offshore Wind Farm Objection

The claim by N.power that there will be no impact on tourism and that the “industrialised landscape” which will result from their endeavours will attract tourists. This is a misleading statement as hundreds and thousands of our visitors visit this wonderful area every year.

The North Wales coastline in question is the largest tourist area and Llandudno in particular is unique among the Victorian seaside resorts. It has survived largely intact because Mostyn Estates has been able to protect the original vision of the Victorian architects and engineers who have bequeathed us this wonderful town with its wide streets and elegant buildings. The Victorian crescent on the promenade has survived virtually in tact and unblemished by the usual planning disasters which have defiled other seaside towns. That is why people come here and accounts for 18% of all bed space sold in Wales are sold here. Tourism supports a prosperous local economy that ripples out into Wales. This tourist industry provides jobs and work for a multitude of small businesses, which exist to serve the local tourist industry, where as the 150 extra local jobs quoted in N.power fact sheets maybe only for the construction period, where as many thousands of tourist support a larger local workforce on a continues bases. The placing of these offshore wind factories in our bay will threaten and put at risk the local tourist industry.

The North Wales Coastline has already 30 x 300ft high offshore wind turbines call “North Hoyle” located off the coast of Prestatyn, some 5miles off Prestatyn Town and are 14 miles off our heritage coastline of Llandudno, Rhos-on-Sea and Colwyn Bay, also the proposed so called “Rhyll Flats” development now trying to re-located at “Constable Bank” (subject to a separate letter) will have 30 turbines 50% higher (500 feet and higher than Blackpool Tower) only 4.5 miles offshore. Now N.Power proposes a further 200 wind turbines some 7 miles offshore called Gwyn Mor. The well-established residential areas of Rhos-on-Sea and Colwyn Bay and Tourists town of Llandudno will be adversely affected by this and other developments—

We request you reject N.power submission and its misrepresentation within so as not to spoil our Beautiful North Wales landscape and our valuable Tourist Industry which provides job for so many.

1 December 2005

Written Evidence from Naomi Klenerman, Energy Officer, Wrexham Branch, Campaign for the Protection of Rural Wales (CPRW)

I am writing on behalf of the Wrexham branch of the Campaign for the Protection of Rural Wales. We are particularly concerned with the effect the current energy policies and targets, laid down by the UK Government and the National Assembly for Wales, will have on our Welsh landscapes, Welsh tourism and Welsh economy.

We would like to comment on Section 1 a./b. in particular where energy is looked at in terms of needs and provision.

In October this year Wrexham Branch of CPRW organised a symposium on energy efficiency and micro generation, addressed by national experts.

The conclusions were clear:

1. UK share of global emissions is 2.3% and if the 2010 targets are met it can only be 0.0004% of global emissions.
   A zero carbon UK would have no effect on climate change (Renewable Energy Foundation)
2. During 2003 electricity consumption rose by 1.5% compared to 2002. As 1.5% = 5.1TWh (Marches Energy Agency)
   Wales would have to produce more than the target of the TAN 8 SSA’s simply to meet the increase in demand in one year alone.
   This is compounded by the fact that the UK is reaching the end of its spare grid capacity by increased obsolescence of generating plant and is becoming increasingly dependent on imported gas so that our supply is no longer secure.
   We need to reduce energy consumption
3. It is possible to cut energy use (electricity and heat) by 20% and to use energy more efficiently. This must be part of an integrated solution and will need support from government. The domestic sector can make as important a contribution as the industrial in reducing demand and local generation.

4. There are many viable options for generating energy from renewable sources; making homes self sufficient; producing energy in a way that is less environmentally damaging: at a local level by micro generation eg producing heat and electricity from biomass which is an ideal solution for small Welsh communities.

   There will be less loss from transmission, as well as reducing the need for connections to the grid. Communities can earn income from the surplus. Local micro generation will encourage the local Welsh economy by job creation and the economic activity of a new industry.

   We urge the committee to recommend a balanced energy strategy. Such strategy should look not only at production but also encourage conservation by incentives and subsidies for efficiency and self-sufficiency in both home and industry and should highlight the contribution of micro generation to the total energy policy.

   We urge you to place value on the role of our Welsh landscapes in providing places of tranquillity for those who live in Wales and for those who visit it. Tourism was worth £63.4 million in Wrexham County Borough in 2004 (NW.STEAM initiative).

1 December 2005

Written Evidence from C Rees

I am very concerned about the proliferation of wind turbine applications for Wales. Up to recently, we had over 30% of the UK’s turbines while we only represent 5% of the population. There should be a moratorium on wind applications so that proper debate can be undertaken.

   Wales exports half of its electricity.

   We could lead the world in wave and tidal energy technology.

TAN 8 WILL BE THE RUINATION OF OUR CHERISHED UPLANDS AND MOUNTAINS AND MUST BE STOPPED

   The Government could halt this planned desecration of our landscapes by removing the enormous subsidies available to developers:

   This money would be better spent on tidal and wave energy schemes. Since 1966, the big tidal power station at LaRance on the Normandy coast has been producing 240 MW of energy with its 24 turbines.

   Many of our rivers often carry more water than they can accommodate, so why not exploit this? In 1998 the Government said that the power from the sun by solar photovoltaic energy was greater than the then total electricity demand for Britain. Much more research is needed into making the storage of solar energy more efficient and Sharp, the Japanese company seems to be close to a breakthrough.

   Clean coal technology should have more investment and this could be exported to developing countries to help them reduce their emissions, especially as China is using more than a third of the world’s coal. This form of helping to reduce CO2 emissions could help far more than building thousands of wind turbines.

   The manufacture of the aluminium castings for wind turbines is very polluting/to produce just one ton of aluminium consumes 2,000 kw/hrs of power. Each turbine requires foundations of more than 1,000 tons of concrete which is also very polluting. These foundations that remain in the ground forever could destabilise ancient water courses and this would be disastrous considering the flash floods we are already experiencing these days and will continue to experience.

   Many applications are targeting huge areas of common land and precious peat bog areas and this should not be allowed.

   This wind industry has the potential of dividing once close communities by bribing some neighbours to give up their land to developers whilst having little regard for the way these turbines would affect those around them for 25 years and more.

   The consequences of this horrendous industry is not explained to the people. A turbine area is regarded as blighted, properties devalued by 20% or more, some people are adversely affected by the infra sound emanating from turbines, and the visual impact is unacceptable. Very few people realise that their energy bills will soar once more and more of this turbine energy gets into the system and little are they told that they will be paying for these massive subsidies that are given to this industry. The DTI insist that a higher and higher percentage of energy is bought from these renewables, which at the moment spells wind power.

   All the renewable industries should be represented in equal number on the Board of the DTI because at the moment it seems that the wind turbine enthusiasts far outnumber all the others.

   We desperately need a moratorium on this wind energy.
JUSTIFICATION FOR WIND TURBINES

To provide energy?

— The least reliable form of renewable generation. Tidal power needs to be developed and needs investment. There are other, more effective and less costly to the consumers type of generating energy such as micro combined heat and power and solar power.

— This type of intermittent power is incompatible with the needs of the electric supply system

— Makes us more reliable on imported gas especially once coal is rundown and the aged nuclear is closed.

— Only operated unpredictably last year for 24.1% of the time

— EON a wind farm research from Germany says the impact on the local grid is very serious. The German grid system is adversely affected by wind energy.

— Intermittent and inefficient

— We waste 30% of our energy

— A very large amount of energy could be saved by using better insulation in our homes and using low energy bulbs. Even insulation in new homes is not properly inspected or monitored.

— This energy costs three times more than conventional energy source in capital cost per MWh. (Paul Golby Powergen CE) Why is it necessary to hide this ROC (renewable obligation certificates) which almost trebles payment to the wind power merchants? This will be taken from all electricity bills from the consumers.

— Many coal—fired plants which produce a massive 30% of our energy will be shutting down over the next 20 years. Those who think that giant wind turbines are going to fill the gap are not thinking straight and don’t understand the limitations of wind.

— The German E.ON Netz say that for back up, traditional power stations with capacities equal to 90% of the installed wind power capacity is needed to be permanently online.

— Spain experienced two “brownouts” when windpower failed across the country in periods of peak demand—on 1 March and 21 June, so Spain is now building a huge number of gas fired power plants and the government now wants to reduce the subsidies to wind power.

To reduce CO₂ emissions?

— The West Danish generating company ELSAM is now on record as saying that the international showcase in West Denmark does not save CO₂ emissions (evidence in an official power point display) The Danish Wind Energy Association for the Danish Government admits that increasing wind power does not decrease CO₂ emissions.

— With 1,043 turbines already in the UK we only save one thousands of CO₂ emissions.

— Even if we were to reach the 10% target by 2010, which we clearly cannot, the CO₂ saving would be equivalent to just 0.0004 of world human emissions (DEFRA/DTI figures). And, if we add to this the massive tropical deforestation and destruction of peatlands, (which store huge amounts of CO₂)—in SE Asia and other areas, then this figure would be more like 0.0002 or less.

— We are a post industrial nation, therefore producing less emissions— cf the USA responsible for 36.1% of global emissions, and refusing to join, and Russia 17% of global emissions , considering ratification in order to gain trading deals and becoming a member of WTO China, India, Australia and Saudi Arabia refusing to join. And why is this government giving huge subsidies to China’s coal industry?

— The New Electrical Trading Arrangements (NETA) that started in 2002 obliged the National Grid to buy the cheapest coal. David Milborrow, BWEA’s energy consultant said that NETA had caused more CO₂ emissions than wind had saved. In 2003 and 2004 there were increases in emissions as power generation had turned to cheaper but dirtier coal.

And is aviation set to treble? 86% increase in air pollution since 1990 and a 56% increase in freight since 1990.

The 1,000 plus Boeing 747s in flight simultaneously, world wide, emit a total of over 400,000 tonnes of CO₂ daily. Three years ago the Royal Commission on Environmental Pollution warned that “by 2050, air transport, unless curbed, will be one of the principal contributors to climate change by human activities.”

We have seen the unveiling of the A380 Airbus, the world’s largest airliner and this aircraft is only 13% more fuel economical than a Boeing 747. Emissions from aircraft are twice as harmful to the atmosphere than emissions at ground level. Air travel produces 19 times the greenhouse gas emissions of trains and 190 times that of a ship. All this makes a nonsense of global warming targets. (The Independent Sat. May 28/2005)

Stanstead is to have another runway which will inevitably increase pollution. The Royal Commission on Environment Poll has said air travel will be the largest source of CO₂ by mid century.
A still more ambitious target was slipped into last year’s Energy White Paper (DTI Our energy future—creating a low carbon economy), to cut CO₂ emissions by “some 60% from current levels by 2050”. Even meeting these ambitious targets will have no real impact on global greenhouses gases. Man made emissions of CO₂ are a small proportion of the total (under 5% on some estimates) and the UK’s share is modest/2% and one tenth of this for Wales. (Welsh Consumer Council)

— October 2004 DEFRA issued a statement saying that U.K industry could increase their CO₂ emissions by 7.5% in the next three years. Are they beginning to realise that this 10% target is not achievable and is going to cause our industries to be less competitive, something that the CBI has been warning the government for a very long while.

— There are far better ways of reducing CO₂ into the atmosphere eg carbon capture where power stations pump back CO₂ into the porous rocks underground. Clean coal technology could help to expand the coal industry without contributing to global warming. By exporting this technology, especially to developing countries like China which is using one third of the world’s coal, we would make a real impact on global warming. Clean Coal Technology at its most advanced can offer Intergrated Gasification Combined Cycle electricity generation In Wales, we have at least a 50yearsworthofidentifiedcoalreserves.

— If housing is to be part of reducing CO₂ we should be using micro combined heat and power. There are no real policies in place to promote this. Also , it has been reported that the many insulating schemes that have been put in place in the building of new houses are not being met, that the inspection system is at fault and that enforcement is missing.

The conclusion is that there is little, if any benefit to Britain or the world in struggling to meet these carbon targets by plastering the country with wind turbines. There are far better ways of reducing CO₂ emissions. Changes in British generated anthropogenic greenhouse gases are far too small to have a significant impact on global warming, which in any case may be a good, bad or neutral thing for us with our temperate climate and ability to adapt. So why have these wind turbines?? Why indeed !!!

DEMOCRACY?

There is strong political backing for this wind power industry.

— Deliberate ploy to take away any local opposition. eg Prescott’s PPS22 any installations above 50 MW to ignore all local planning laws and to go straight to the DTI. Then WAG’s TAN 8 to do the same thing. Is it true that a majority of the members on the Board of the DTI have wind power interests?

— No attempt made to inform the public/nothing on the TV etc.

— Where was the Public debate on TAN 8—was there even a full party debate on TAN 8 in the Assembly? This document has the potential of changing the face of Wales forever and of having a profound effect on the lives of the people and yet, most know nothing about it. An unprecedented number of letters of objections for any planning document,(1,800 letters) were sent in concerning TAN 8 and CPRW asked for a public enquiry but this was refused.

— No attempts made for public consultation.

— Not allowed to complain to the local councils until an application goes in and then they give us only 3 weeks to respond, study the Environmental Statement and to tell the public what is happening.

— These wind installations are imposed on us despite strong local opposition—look at Cefn Croes and Scarweather (the people of Cefn Croes in the Cambrian Mts wrote a book about their struggle to fight off the 39 massive turbines that were built in this most beautiful area of mid Wales—an area that should have been designated as a National Park—www.cefncroes.org.uk) Scarweather, 3,100 letter of objections were received compared to nine letters for, and an independent Inspector recommended against the proposal and ALL were overthrown.) The opinion of the Welsh people was asked for but what did they do with it?

— Some Councils encourage wind farm proposals. Very often, local councils are forced to abandon their age old and trusted environment protection planning laws in order to pass a developer’s application. Often local councillors are not competent to making a rational decision and some still believe that the choice is between nuclear and wind power. (A nuclear station of 1,500MW yields base load generation of 1,350 MW—we would need 2,250 gigantic 2MW wind turbines to match this) Here in Ammanford, our Town Council voted for an application despite the fact they had not read the mining report which was 13 pages long, that was placed in the Appendix of the developer’s Environmental Report and made no enquiries about the mountain that is honeycombed with old mines, has an earthquake fault running through it plus another fault.

— Taking away our democratic rights in order to please the developers causes increasing dissatisfaction as more and more protest groups are formed all over the country .
Costs to the public/the rate payers and British Business

- Who picks up the cost of the devalued properties—20–30% for hundreds of homes in the immediate area? These power companies say they don’t take into account the devaluation of our properties when making their plans. There is the proven Cumbrian case and more have followed—cases in Carmarthenshire where an estate agent has advised prospective vendors to reduce their prices by £45,000—for a typical three bedroom house if a turbine site is built near them.

- New relay stations have to be built for TV stations—who pays for this?

- What is the cost to the Tourism Industry, which, for Wales accounts for £2.5 billion a year and employs so many.

- We will have to pay three times more for this wind electricity.

- Will these turbines come down when other more efficient renewables are launched—and who will pay to dismantle them when the companies have disappeared with their loot?

- This industry is receiving 27 times the subsidy that coal ever received

- How do we regain the pasture rights, the food source if these are to be built all over the country?

- The cost in trying to reach government targets is enormous—according to the Office of National Statistics, environmental taxes amounted to nearly £34 Billion in 2003, over 3% of GDP. This is justified by the government on the grounds of protecting the environment. 67% comes from the duty levied on petrol and diesel. Then there are the climate change levy, further new “environmental” costs in the pipeline including the European Union’s greenhouse gas emission trading scheme (ETS) which will result in companies having to purchase additional “emission allowances” if their emissions exceed Government—imposed allocations. All this will damage British business’s competitiveness, and if they drive business from the UK to places like China or India, CO2 emissions will increase as these countries are less efficient users of hydrocarbon energy.

- Taxpayers will be subsidising this industry to the tune of £6.5 billion by 2010 and by £12.5 billion by 2015. In February 2005, the National Audit Office wrote, “the level of support provided by renewable Obligation is greater than necessary”. The Commons Public Accounts Committee themselves complain that this is not value for money and that a carbon tax would be a far less complex way of reducing CO2. As consumers are providing this massive subsidy to the renewable industry, unlike public expenditure, this subsidy does not receive the annual scrutiny by parliament and this is unacceptable. This country is the most attractive place in the world to build turbines because of the huge tax breaks and other incentives.

- About a third of the funds given to this industry exceeds the support it needs.

- Already, firms are leaving this country because of the high energy costs and taking their factories elsewhere, no, not to countries with cheap labour but to countries like Belgium where the costs are lower. Concerned about the high cost of energy in this country, Alan Eastwood, head of Competition and Utilities at the Chemical Industries Association, told the Financial Times recently; “We can’t live with prices 50% higher than our competitors on the Continent. This is threatening the future of industry.” We have problems with high energy costs even before this wind energy comes into the equation.

- In order to produce just a 2MW turbine machine, between 100 and 200 tonnes of steel has to be smelted for the tower and another 40 to 50 tonnes of steel for the nacelle at the top of the tower, plus a mix of metals like copper and aluminium to bring the total weight of the nacelle to 60 tonnes. Smelting is a very high energy process.

Cost to the environment?

- They take away our essential, could be life threatening, food source. These sites cover large areas of our uplands and common land where there might be hefted sheep and cattle. Wind developers minimise the effect of turbines on animals but there are many cases of cattle aborting near turbine sites and who would want to farm in such blighted areas? Once an area becomes marked as “industrialised” there is no going back.

- What devastation is caused by embedding these turbines in 1,000s and 1,000's of tons of polluting cement—the greatest pollutant of all—effects of which reacts to the soil for years to come. These bases remain in the ground forever. Electric cables are buried deep into the ground and these remain there forever.

- Disturbing peat bogs in construction causes huge release of CO2. On any turbine site, one sees huge mounds of peat tossed to one side and just left to dry out. The destruction of the world’s peatlands is contributing significantly to global warming, according to research presented to the annual conference of the Royal Geographical Society (2/9/05)
— Massive environmental impact on birds, flora and fauna, and these are supposed to be protected by European laws. Habitat destruction is the single most important danger to wildlife. The entire ecological community is affected. Cefn Croes construction site is an ecological holocaust of some dimensions, which is now being visited and filmed from all over the world, a disgrace that this was ever passed by the then Brian Wilson of the DTI (www.cefncroes.org.uk)

— Lines of pylons have to be built to connect turbines to the grid, causing even more disruption.

— Wide access roads are built to connect the turbines and often, developers quarry the very upland or plateau to provide the aggregate needed, adding to the devastation.

— These turbines have a massive visual impact. Proposals often go on the edges of constituencies and the cumulative impact is never considered.

— They destroy areas of scientific interest.

— Most of our uplands have prehistoric remains which should be preserved and not desecrated.

— In Germany, they call the turbines “bird slicers”. In the Navarre region of Spain, a biologist studied the effects of turbines over one year on wildlife and found that 6,000 birds, including golden eagles and 600 bats were slaughtered. This is repeated all over the world even along bird migratory routes.

Cost to people’s health

— Harmful effects of audible noise and low frequency—studies at Salford University.

— GP Dr. Amanda Harry who works in Cornwall reported the low frequency noise is known to cause extreme stress to some people and she reported her cases in the House of Lords. Last research, seven years ago and should be reviewed every year but it has not been reviewed. The new 300 foot to 400 foot turbines are much larger than the existing turbines and their effects on human health should be studied. (see added notes.)

— Cause physical and psychological damage.

— Enormous stress on our farmers who could lose their livelihood after years of tending to their land and animals and keeping the balance of nature and especially after having gone through the disastrous foot and mouth episode.

Is plastering our countryside with these environmentally damaging turbines going to alter or have any effect on the climate???

Is this wind industry far too high a price to pay for by the consumers ???

Are these wind turbines going to produce enough energy to fill the gap left when our coal stations, at present providing us with 30% of our energy, are closed down in the next two decades???

If the thousand or so turbines at present in existence are providing us with only four thousandths of our energy, then clearly this proves this is the wrong technology.

Wind Turbines and their effect on human health

Onshore wind turbines are a health hazard to people living near them because of the low frequency noise they emit, according to new medical studies. Dr Amanda Harry, a GP working in Cornwall, who presented her findings to the House of Lords said that some of her patients demonstrated a range of symptoms from headaches, migraines, nausea, dizziness, palpitations and tinnitus to sleep disturbance, stress, anxiety and depression. These symptoms had a knock on effect on their daily lives, causing poor concentration, irritability and an inability to cope.”

Dr Harry said that low frequency noise induces headaches and anxiety attacks and could cause disturbed sleep at even very low levels. She said it travels further than audible noise, is ground-borne and is felt through vibrations and some people have to leave their homes to get away from the nuisance. Despite their obvious suffering, little is being done to relieve the situation and people feel their plight is ignored.

Conservative peer Lord Dixon Smith urged ministers to investigate a study that showed that 93% of people living close to wind turbines had been adversely affected, with some having to move house to get away from the problem. Lord Dixon Smith said that Denmark had ceased building new turbines, in part, as a consequence of health concerns.

Dr. Harry explained that this problem was happening all over the country.

Another doctor, Dr Bridget Osborne from Moel Maelogan, A village in North Wales where three turbines were erected in 2002 has presented a paper to the Royal College of General Practitioners detailing a “marked “increase in depression amongst local people. She says there is a perception that wind power is “green” and has no detrimental effect on the environment but these turbines make low- frequency noise that can be as damaging as high frequency noise. She said that Wind power developers measure the audible range of noise but never the infrasound measurement—the low frequency noise that causes vibrations that you can feel through your feet and chest. This frequency resonates with the human body—their effect being dependant on body shape. For some, she said this is incredibly disturbing.
A Dr Stephen Briggs, an archaeologist living in the village of Llangwyfron in West Wales says that once the turbines near his home started operating, he couldn’t work in his garden any more as the noise was unbearable and described it as if someone was mixing cement in the sky. After four years of frustrated appeals, he and his family had to leave their home of 17 years. House prices near to wind turbines have also plummeted.

Mark Taplin, who has lived close to wind turbines near Truro in Cornwall for almost a decade said it had been a miserable, horrible experience. He says they are only 440 metres away from him, that they grind one down, you can’t get away from them, make you very depressed—the chomp and swoosh of the blades creates a noise that beggars belief.

The results of a Mori Poll and research commissioned by the National Trust confirms the countryside provides essential emotional, spiritual and physical benefits to millions of people. According to the findings, “far more than 80% of adults visiting the countryside find that it is a vital counterbalance to the stresses of daily life, not an optional extra, but crucial to the quality of their lives”.

Low frequency noise permeating buildings and ruining the lifestyles of people is now being taken seriously by medical research.

New research from the Dunlaw wind power station in Scotland has shown that the effect of noise and vibration from wind turbines, especially these new, larger turbines used today, is felt at a much greater distance than claimed by the turbine developers The Keele University researchers found that when turbines start to generate at low wind speeds considerable infrasound signals can be detected as far as 10 kilometres. Professor Peter Styles led the team from Keele University.

This study is backed by a recent study by acoustic experts at the University of Groningen in the Netherlands. Denmark and Germany are now at the forefront of serious research into the detrimental effects of wind turbines In some cases they cause psychological problems, heart rhythm irregularities and depression.

Professor John Ffowcs Williams, professor of engineering at Cambridge University and a world expert on acoustics and noise reduction has said that the regulations as they are, are outdated and in ways inadequate and that it is known that modern, very tall turbines do cause problems and many think the current guidelines fail adequately to protect the public.

The present government research available was done on much smaller turbines than those used today.

November 2005

Written Evidence from People Against Corwen/Cerrigydrudion Turbines (PACT) and Denbighshire Against Rural Turbines (DART)

PACT and DART are two pressure groups lobbying against the spread of on-shore turbines particularly in the Hiraethog area of North Wales which is centred on the TAN 8 SSA A. SSA A is primarily made up of the Clocaenog Forerst plus Mwdwl Eithin to the South. Adjoining areas include: the historic A5 route to Holyhead, Snowdonia to West, Offa’s Dyke to East and Denbigh Moors to North.

We are very pleased to have been invited to submit evidence to the Inquiry into Energy in Wales by the House of Commons Welsh Affairs Committee.

1. DIVISION OF POWERS

We have concern that there is a lack of clarity in the division of powers between the UK Government and the Welsh Assembly Government (WAG). Our understanding is that energy production in Wales is not a “devolved” responsibility. However, the publication of WAG’s TAN 8 proposals make repeated references to “... the Assembly Government’s targets for renewable energy production”.

In launching TAN 8, the two Ministers responsible state that TAN 8 “... will facilitate our sustainable development and energy strategy objective to make Wales a global showcase for clean energy by 2010”.

We suggest that this covert promotion of energy policy under Planning Policy Statements has resulted in a fundamental weakening of Local Authorities’ powers of protection of the countryside of Wales.

2. LACK OF DISTINCTION BETWEEN CO2 REDUCTION AND RENEWABLE ENERGY PRODUCTION

PACT and DART would like to see more distinction made between policies to achieve:

— CO2 reduction; and
— renewable energy production.

At the energy policy level the TAN8 documentation blurs the distinction between the Kyoto Agreement (reducing greenhouse gases including CO2) and the separate EU Renewable Energy Directive (renewable energy production to safeguard future energy supplies).
Our members strongly support both policies but are concerned that the lack of distinction between the two is preventing the use of the most cost effective ways of achieving both targets.

This problem of confusion between the two issues was identified by the National Audit Office in 2005. It reported that the current Renewable Obligations system of reducing CO\textsubscript{2} is several times more expensive than other measures. Even if the 10% renewable electricity target is met by 2010 it will cost £1 billion/year but will only save 1.7% of UK CO\textsubscript{2} emissions.

The same report acknowledges that direct investment in energy efficiency measures would produce better results, at half the cost. Reducing consumption directly reduces CO\textsubscript{2}.

Separate investment could then be made into the development of renewable energy production that would provide the best long-term effectiveness whilst ensuring the least damage to the rural environment.

7. **Wales’ Energy Needs and Provision**

We note that Wales is already generating nearly double the amount of electricity that is used within Wales and therefore its own energy needs are amply met. Even with the closure of Wylfa, Wales’ electricity supply will be in surplus for some years to come.

If it is considered that, for the future, this nuclear capacity needs to be replaced, it will need to be done by generating a capacity of a similar characteristic i.e. that which is suitable for supplying the secure ‘base load’ i.e. reliable and one that is not intermittent.

*TAN8*

8. **Emphasis on On-shore Windpower**

The detail in TAN 8 is almost exclusively about the development of on-shore wind power.

For some reason the WAG proposals are a significant departure from the approach to renewable energy developments in England and Scotland. It deserts conventional landscape safeguards and, without corroboration, revises the balance of renewable energy in favour of onshore wind developments with virtually no increase in other renewables.

PACT and DART argue against this one sided policy. We believe it is misguided. It would be much better for the future to concentrate on encouraging the development of a mix of technologies. A mix would give WAG a greater choice of options for the next generation of renewable generation systems and would not risk supply by focussing on a single source.

9. **Presentation by Professor Peter Cobbold**

The presentation sent directly to the Committee by Professor Cobbold gives an overview of his understanding of the effect of TAN8, and SSA A in particular. His conclusions are fully supported by PACT and DART and for that reason we ask you to look at his presentation in conjunction with this paper as we have not repeated his arguments.

6. **Conflict of Interest**

We ask the Committee to inquire into reports that the same “expert advisors” are being:

- contracted to advise on the development of policy at Assembly government level in Cardiff;
- consulted by local authorities on the modifications of Local Development Plans to accommodate the requirements of TAN 8;
- retained by the wind turbine development companies to produce the environmental impact studies required for each planning application; and
- involved in the commercial companies constructing and operating the turbine developments.

We would maintain that each of the above strands of the development process should be meticulously independent not only to prevent corruption but to give confidence to the public.

7. **Turbines in the Forest**

The SSAs include substantial areas of Forest; however turbines and trees do not mix, with a 30% reduction in output from turbines when placed in forestry. Although TAN 8 acknowledges this problem, stating “retaining trees is likely to reduce energy yield for the turbines” it offers no firm guidance on clear felling, leaving it to the local planning authorities to secure the “best outcomes”.
With the turbine developments being driven by private investment, there is going to be enormous pressure to clear-fell around turbines to increase the profit margins unless, clear and enforceable guidelines can be laid down at approval stage. It is estimated that up to 50% of the Clocaenog Forest could be clear felled.

We ask the committee to look into the desirability of requiring the Forestry Commission to provide current felling and re-stocking maps and forestry design plans for all the areas affected by TAN 8 and that these should be integrated into the TAN 8 planning process.

8. WILDLIFE IN THE CLOCAENOG FOREST

Tree cover

The tree cover in the UK is still very low; only a few countries have a lower percentage than the UK. The Clocaenog in particular is one of only three Forestry Commission areas in the UK in the middle of a long term trial of maintaining continuous tree cover. How can this policy be so easily turned around without due consideration?

Wherever there is a woodland, both broadleaved and coniferous, there is an increase in biological diversity. Ecologists are at last recognising the variety of ecology that occurs in coniferous forests. It has only recently been found that the canopy of a coniferous forest supports a similar ecology to that on the woodland floor of a broadleaf forest.

An example of this is the dormouse (a European protected species) which in the Clocaenog is living and breeding up in the canopy.

As a result of TAN 8, even with the minimum felling of keyhole slots for each turbine and access routes for construction, the integrity of the forest will be compromised. The pockets of forest that will remain will not support the same diversity of wild life as does the present integrated whole.

Red squirrels

Clocaenog has the only viable population of Red Squirrel living in Wales. The Red needs a variety of trees of different age-class, mainly medium to mature age, to stand any chance of strong survival. For example, its main food, Norway Spruce cone seed may only be produced once in three or four years in any quantity. There needs to be other tree species of seed bearing age such as pines, larch, sitka spruce, alder and birch to fill the gaps. Their cycle of major seed bearing years will be different from the Norway and will help to guarantee survival. The Red squirrels need continuous cover to move around in search of their food supplies. There is a strong likelihood that fragmentation of the forest will have a negative effect on their ability to survive.

Other rare species including pine marten

There are several other species of importance in Clocaenog such as Dormouse, Newts, Bats, Otters, Hares, Adders and others. There are enough good reports of Pine Marten presence for a 95% certainty; the fur and photographs giving the final proof are not far behind. This is a mammal that about 10 years or so ago had people speaking out and saying that it was extinct from Wales. Should we be destroying the habitat of something as rare as this without due consideration, for something as inefficient as Turbines?

There has also to be full consideration given to the smaller items such as plants and insects. The rare Moonwort is present in Clocaenog. There will be a whole range of species thriving in Clocaenog, some may be new to science or at least to Wales. A few years ago a survey of Veteran Trees in nearby Chirk Castle Estate found a species of insect, new to science, in one of the trees.

CRoW Act 2000

Section 74 of this Act places a duty on WAG to have regard in exercising its functions to conserve biological diversity in accordance with the UN Convention on Biological Diversity. In May 2003, Carwyn Jones the Minister for Environment, duly published a list of species and habitats that WAG considered important for that purpose.

Sightings have been recorded in the Clocaenog of seven out of the 10 mammals and 11 out of the 23 birds on this published list of protected species. This diversity in birds and mammals in the Clocaenog would indicate that a large percent of the 59 protected reptiles and invertebrates and 68 protected species of plants, fungi and lichens are also present.
**CRoW Act—List of Mammals and Birds of Principal Importance for Conservation of Biological Diversity**

Note: Sightings of species in Clocaenog Forest—in bold

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<tr>
<th>Mammals</th>
<th>Birds</th>
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<tr>
<td><em>Arvicola terrestris</em></td>
<td><em>Acrocephalus paludicola</em></td>
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<td><em>Barbastella barbastellus</em></td>
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<td><em>Lepus europaeus</em></td>
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<td><em>Myotis bechsteinii</em></td>
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<td><em>Pipistrellus pipistrellus</em></td>
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<td><em>Rhinolophus ferrumequinum</em></td>
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<td><em>Rhinolophus hipposideros</em></td>
<td><em>Emberiza schoeniculus</em></td>
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<td><em>Sciurus vulgaris</em></td>
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<td><em>Pluvialis apricaria</em></td>
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<td><em>Pyrrhocorax pyrrhocorax</em></td>
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<td><em>Sternula dougallii</em></td>
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<td><em>Grey partridge</em></td>
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<td><em>Bullfinch</em></td>
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<td><em>Roseate tern</em></td>
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<td><em>Turtle dove</em></td>
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<td><em>Song thrush</em></td>
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<td><em>Black grouse</em></td>
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<td><em>Lapwing</em></td>
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**Ecology on Mwdwl Eithin**

Records that have been kept of wild life and Fauna on Mwdwl Eithin, the other part of SSA A, has also revealed a very extensive range of ecology which would be severely disturbed by the erection and operation of wind turbines.

**Ecological survey and environmental impact study**

Because of the CRoW Act, the number of protected species involved, and the difficulty of sighting and quantifying their presence, there must be a full ecological survey carried out in the whole of the SSA A area prior to permission being granted for wind turbines. This must involve specialists in each field of study, must occur several times in the year and last an absolute minimum of two, preferably five years. In that survey full consideration must be given to the effects of fragmentation.

This should be coupled with a full environmental impact study that includes detailed consideration to the effects of: forest fragmentation, geological and hydrological changes due to construction of access routes and foundation works, and noise during construction and from the turbines.
Bird strikes

There is likely to be a problem with bird strikes. Many species of birds will be at danger as they will be flying higher to clear the surrounding forest canopy. Specific data is difficult to measure as many strikes will be during the hours of darkness and nature, ie foxes, badgers, and other predators, will be clearing a lot before daybreak. Time of year is also an important factor, for example, it would be no good doing a count in February if the strike rate was happening when migration was taking place.

9. Tourism

Tourism is one of the main industries in Wales and is still growing. In 2001 it accounted for 7% of GDP at a value of £2.6 billion from 10.9 million tourist trips providing 100,000 direct jobs plus 10,000 self employed (source WTB).

Why people visit Wales

In 2003 an independent study was commissioned by WTB of the “Impact of Wind Farms on Tourism in Wales”. In the survey of visitors, four out of five respondents indicated that “the beautiful scenery” was a key influencer. Other key positive elements were “a good place to relax and get away from it all” and the “unspoilt environment”.

88% of those interviewed agreed that “The attraction of peace and quiet in the countryside and the coast of Wales” was an important factor.

Local visitors would add “the quality of silence”.

Visual impact of turbines

If TAN8 is implemented the majority of Wales will be visually affected with large areas of the National Parks and AONBs also affected. How this is built up can be seen from the map on the following page.

This map does not take account of off-shore turbines but there would be a double effect in the coastal areas.

The visual effect of the on-shore turbines is so extensive because turbines need to be placed on the high ground. With the scale of turbines now in use it is not possible to find areas to site them that cannot be seen for many miles around.

National policy to increase tourism

In the Clocaenog area specifically, there has been an extensive drive over the last five years to increase tourism and assist farmers to diversify. In 2002 an Environmental Strategy and Action Plan for the Hiraethog area (centred on the Clocaenog Forest) and part funded by the EU, proposed several objectives:

— The development of the local economy through sustainable green tourism initiatives—developing package holidays, and an equine network.
— Improving access to the countryside through wildlife education.
— Enhancement of the area’s characteristic landscapes feature.

Horse riding

The Wales on Horseback initiative, again part funded by the EU, is a direct result of the Hiraethog Action Plan. This is now up and running. In principle, riders book a holiday through Wales on Horseback which plans a trail and makes overnight arrangements. Riders trek through the area, stopping overnight for B&B along the way.

In principle horses and turbines do not mix. Whilst some experienced riders may be able to ride near turbines, issues of safety would prevent holiday rides being planned near to turbines. The effect of TAN8 would therefore be to remove the whole of Hiraethog central area threatening the viability of the scheme in this part of North Wales and preventing many properties within the area benefiting from this earning potential.

Holiday lets and bed and breakfasts

Wales Tourist Board has been encouraging property holders to invest in high quality holiday lets and B&B’s. There has been a substantial growth in this market and this success has resulted in benefit to the owners and also to the rest of the tourist market as the visitors are resident and use all the surrounding services.
Experience from our members confirms that the prime reasons for visiting the Clocaenog Forest area are tranquillity, peace and quiet, and the wilderness.

TAN will change the nature of the area; it will become industrialised, it will be noisy, there will be structures out of all proportion to the surrounding landscape. This is the opposite of what visitors say they want.

**Fishing**

Llyn Brenig is at the centre of the SSA A and is surrounded by land identified for turbines. Llyn Brenig has been developed by the Environment Agency and is now an internationally recognised centre for fly fishing. Many thousands of people are attracted throughout the season with a large number coming from abroad.

Fishing is the epitome of tranquillity. The proposed turbines will be near, visually intrusive and generate noise from all directions.

**Rambling**

Evidence on rambling is given under a specific heading later on. The Clocaenog area is an 1 hr drive from Liverpool and Manchester and easily accessible to the whole North West of England.

**Forestry**

Under the WAG strategy “Woodlands for Wales”, launched by the Minister for Rural Affairs in 2001, one of the five strategic objectives is to develop woodlands for Tourism. It reports that 11 million visits are made to Welsh forests each year.

Under TAN8, all the woodlands identified in the SSA’s will be fundamentally altered by effects of extensive felling and erection of structures over three times the height of mature trees.

10. RAMBLERS AND RIGHT OF OPEN ACCESS

The Ramblers’ Association North Wales (RANW) welcomes the opportunity to contribute to the debate on energy provision in Wales.

RA Wales (RAW) is submitting a separate response which has the full support of RANW.

The CRoW Act was placed on the statute book in 2000. The main plank of this is the recognition that the countryside makes a significant contribution not only to the economy but also to public wellbeing and that public access to mountain, moor, heath and down is in the national interest. The Act sets out plans to improve the Rights of Way network and addresses countryside protection.

Appendix C attached provides evidence of government intention to meet public aspiration.

The Consultation Paper on Countryside Access February 1998 provides evidence of government intention to meet public aspiration; it states:

“Greater freedom would become self defeating if the landscape itself were harmed, its tranquillity eroded and its wildlife put at risk . . .”

TAN 8 has designated seven areas (SSAs) for major wind power development. Within these areas there is a predominance of land owned by the Forestry Commission, to which open access was agreed two decades ago. In addition the SSAs cover land to which the public has only this year been granted the right of access. Outside the seven SSAs, access land, almost by definition, is deemed suitable for wind power installations.

The RANW believes industrial installations, as wind turbines clearly are, on access land and land crossed by rights of way and recognised as walking country, are not only totally contrary to the principles of the CRoW Act but are damaging to the economy. The people of Wales and those who visit are being obliged to witness the industrialisation of the very landscapes that are synonymous with Wales and which by statute the British government has judged should be made accessible to the populace.

Quoting from the Hobhouse Report 1947 from which the CRoW Act was born,

“They (the proposals) will enable active people of all ages to wander harmlessly over moor and mountain, over heath and down and along cliffs and shores and to discover for themselves the wild and lonely places, and the solace and inspiration they can give to men who have been ‘long in city pent’. Thus we believe an effective contribution will be made to the health and well being of the nation, and an important step taken towards establishing the principle that the heritage of our beautiful countryside should be held in trust for the benefit of the people”.”
IN SUMMARY

The walking public are the biggest contributors to the economy of rural Wales. (The Economic Value of Walking in Rural Wales—Peter Midmore, Professor of Rural Studies University of Wales Aberystwyth, Ramblers’ Association March 2000)

The foot and mouth crisis demonstrated the importance of an open countryside to the Welsh tourist industry. WAG has set arbitrary targets for wind power installations imposing wind power on the people of Wales without their consent. Wind does not and cannot, meet the energy needs of the people of Wales, whilst its contribution to a reduction in global warming is infinitesimal and irrelevant.

From the perspective of the CRoW Act, RANW maintains that WAG’s arbitrary strategy, which is leading to the industrialisation of the Welsh countryside, runs counter to the wishes and benefit of the people of Wales and to the intention enshrined in UK legislation.

Mary Robinson
Area Countryside Secretary Ramblers’ Association North Wales

11. HYDROLOGY

Heavy civil engineering works associated with wind farms can lead to catastrophic consequences to potable water, an example of this happened at Glendaruel, Argyll, when 17 dwellings lost their water supply due to Cruach Mohr Wind Turbine development.

This had been envisaged by the Scottish Environmental Protection Agency (Ref: Letter SEPA dated 28 May 2002) The developer Scottish Power, at its own cost, had to provide the community with pumped potable water.

Conwy and Wrexham Councils have the same fears with regard to possible disruption, loss or contamination of water supplies due to wind farm proposals. (Ref: Conwy Council Letter and Wrexham Council Email)

Residents on spring water

SSA A zone A and B have approximately 150 residents in Conwy reliant on spring water and streams for their potable water supply. There are also a number of farms that rely on this water source to feed animals. Below is a map showing the springs in Denbighshire supplying homesteads and farms.

Who would be responsible for the loss of water to any of these properties?

Conwy CBC have made it clear during the scoping process of Mwdwl Eithin that they would not be responsible to any loss or damage to the existing water supplies and that this would be a civil claim.

We believe this is unacceptable and that the developer should retain responsibility in perpetuity.

Scale of construction

SSA A has been earmarked for 140MW of installed capacity, this could equate to 70 to 100 wind turbines each requiring foundations of at least 2.5 metres, crane pads, trenches for cabling at least 1 metre deep, miles of access tracks along with borrow pits (a green word for local quarrying). The pH values of ground water can be drastically changed by the import of stone and aggregate to construct crane pads and access tracks. Borrow pits on site are used to ensure that the aggregate required for these is of a similar stone and thus pH to the surrounding geology. However the quantities needed could create devastating disruption to the aquifers and ecology of the area. All the above could have detrimental effects on the aquifers, streams and springs supplying the dwellings within the forest.

Turbine foundation at Tir Mostyn

“Aquifers close to, or outcropping at, the ground surface are more vulnerable to pollution or physical damage that could harm both the quality and flow of the groundwater. The flow of groundwater is slower than surface water, and the deeper into an aquifer the water is, the slower it moves. This means that if groundwater becomes polluted and the pollution moves deep into the aquifer, the water can potentially remain polluted for a very long time. This could subsequently lead to a deterioration in the quality of drinking water supplied from a groundwater source or damage vulnerable groundwater dependent rivers and ecosystems” (Ref: Environment Agency 2004 Water resources Groundwater.)
12. Noise

Effect of noise on health

There is now good evidence that noise from wind turbines can have serious effects on the health on people dwelling up to a mile away from turbines. A recent report to the Royal College of General Practitioners by Dr. B. Osborne puts the evidence of damage to health caused by noise from wind turbines onto a solid medical foundation. The van den Berg Report mentions a pulse like sound along with further noise issues associated with turbines (Ref: Euronoise Conference 2002: Wind Turbines at Nigh).

DEFRA, commissioned Casella Stanger to provide general information on low frequency noise. (Ref: Low Frequency Noise Technical Research Support for DEFRA Noise Program 2001) One of their findings indicates wind turbines emit low frequency sound waves, which could lead to sleep disturbance, headaches, stress, annoyance, unease, fatigue and possible nausea.

Furthermore Dr Amanda Harry had come across the same symptoms as described above in all but one of 14 people living near the Bears Down wind farm at Padstow, Cornwall consisting of 16 turbines. She reported that the residents were suffering from the effects of Low Frequency Noise, due to the turbine development.

Local residents living within a mile of Hafoty Ucha wind farm have experienced a repeated thud sound emanating from the turbines at low wind speeds. This noise nuisance has been registered with the Public Protection officer at Conwy CB Council. The newly built Tir Mostyn wind farm in Denbighshire is audible from certain residences in Llanfihangel GM 2.5 kilometres away.

Silence

Residents in the SSA enjoy long periods during the year of absolute silence. Visitors and tourists refer to this.

The EU Directive on Environmental Noise 2002 states; “The vision for the year 2020 is to avoid harmful effects of noise exposure from all sources and preserve quiet areas”

New research required

In the TAN 8 section 2.17 and 2.18 “Low Frequency Noise”, the core information used to arrive at the stated conclusions is from a survey carried out 9 years ago. Technology has advanced at such a rate since that date we are now looking at turbines three times the height and four times the generating capacity.

We would like to see new research commissioned in this area.

Developers noise surveys

Developers and their agents generally conduct noise monitoring over a two week period. From our experience the surveys have been carried out during the winter months, harnessing the noisiest time of the year as a base foundation for the acceptance of background noise levels for the whole year. This abnormally high background sound level is extrapolated to surrounding properties and is then used in the developers Environmental Impact Studies to predict that the noise of the proposed turbine development will not be heard above the background noise.

We would like to see noise monitoring surveys conducted on a continuous basis over the four seasons at all the properties that are likely to be affected, thereby giving a true reflection of background noise levels for the areas concerned.

We also ask that noise monitoring is carried out after completion of the development by an independent acoustics expert, at cost to the developer,

13. Compensation

TAN 8 states that one of the characteristics of the chosen SSA’s is that they are sparsely populated. For the significant number of people who live there, the quality of life provided by the unobstructed views of beautiful countryside, tranquillity and quiet, is the counterbalance to the inconveniences of living in these isolated locations. These are qualities that they have chosen and enjoy and will be taken away, without any benefits in return, with the construction of the proposed turbines.
Public inquiry ruling in favour of private interest

Potentially harmful effects on the value or saleability of property or upon the economic prospect of a business are often dismissed by planning officers as a private matter. However in July 2004 a Public Inquiry refused appeal to build 6 turbines at Llethercynon, Powys [ref: APP/T6850/A/03/1122720] on the basis that:

“... the visual impact of the proposed wind farm on each individual resident living in the vicinity is an aspect of the public interest [our emphasis] ... and did not consider that it is in the public interest to impose on them the severe impact that would result if the proposal went ahead.”

According to this judgment decision makers are required to take into account adverse impacts on private interests of all kinds and on residential amenity, even to the extent of interpreting property price effects as an index of adverse impacts.

In public sector projects, “blight” on properties triggers compulsory purchase or compensation.

In correspondence with WAG, the Minister has replied that no compensation can be legislated for as the turbine developments are to be carried out by private companies. It seems unfair and inequitable that this should remain so, as public funds are being used to subsidise the private wind turbine operating companies who are responding to a WAG development policy.

The Minister refers to the courts, but most home owners will not have the resources nor the knowledge to sue the developers.

We request that compensation is built into the planning process to include the following issues:

— Damage to Water Supply
  This has been dealt with under the heading of Hydrology. It should be the responsibility of the developer to permanently rectify at its own cost for any degradation of water supply to properties and farm land caused by the development, without the need to recourse to the courts.

— Noise
  The issue of noise has also been dealt with under its own heading. The operation of Tir Mostyn wind turbines has demonstrated, to those living there, that they produce a noise that is clearly audible above background sounds. The concentrations of turbines required in SSA A would create a cumulative effect. Local people are used to having long periods of silence. This is one of their rights.

— Visual Impact
  The enjoyment of uninterrupted views is one of the rights enjoyed by those living within and near to SSA A. The erection of up to 100 turbines, over three times the height of mature trees, will industrialise the landscape.
  The views which are rural and natural and tranquil are another of the rights of those living there that will be taken away by implementing TAN8

— Loss of Tourism Income
  As referred to earlier under Tourism heading, the turbines will destroy a key attraction for tourists, “the attraction of the peace and quiet of the countryside”. This will mean a loss of income for those that have already invested in their tourist business

— House Values and Saleability
  There is increasing evidence that the effect of all the above does have a harmful effect on the price of property. In the SSA A this effect will be magnified by the cumulative result of noise and visual impact of the number of proposed turbines.

Where a property cannot be sold because of “blight”, compensation for the full value of the property should be made.

(Annexes not Printed)

December 2005

Written Evidence from Graham Paterson, Head of Policy, Institution of Electrical Engineers (IEE)

The Institution of Electrical Engineers (IEE) welcomes the opportunity to contribute to the Welsh Affairs Committee’s Inquiry into Energy in Wales. We believe that the task of this Inquiry is a timely one in the context of the recently announced government review of UK energy policy. We hope that in evaluating its evidence the Committee will give full consideration to the potential policy interactions in this complex area of policy, and would like to offer two general recommendations:
1. Energy policy for Wales should aim to optimise the Welsh contribution to a balanced low-carbon energy portfolio on a GB-wide basis. The Welsh electricity system benefits from good connectivity to both England and Scotland, while offering the potential to harness abundant natural energy resources, particularly wind and marine. Marine power technologies are currently at a crucial stage in demonstration and commercialisation, offering a unique opportunity for Wales to lead innovation in this area. The UK government should support Welsh national initiatives to promote Research, Development and Demonstration activities in Wales, such as those recommended in the Welsh Assembly Government’s Route Map for Energy.

2. Demand management must be a central plank of a prudent energy policy. There is clearly a need to promote a culture of energy conservation in light of the disappointing performance of “traditional” energy efficiency campaigns. Government at all levels must demonstrate long term commitment to educational initiatives promoting personal and community responsibility for energy usage. Energy efficiency measures for homes and businesses are currently promoted by both the UK Government and the Devolved Administration. It will be important to ensure good policy coordination between different levels of government.

The IEE’s 120,000 members are drawn from a broad range of engineering disciplines, representing a wide range of expertise from technical specialists to business leaders. Many of the most experienced members of the IEE, and their sector peers, voluntarily participate in a variety of IEE policy guidance groups. To these groups they bring their wealth of personal experience and knowledge, independent of commercial interests, to address the policy issues of the day and give the IEE independent and authoritative views of trends in technology and engineering. This response has been prepared on behalf of the IEE Trustees by the Energy Sector Panel whose details can be found at: http://www.iee.org/Policy/sectorpanels/energy/index.cfm. Input from the IEE Membership was requested in preparing this response.

2 December 2005

Written Evidence from Dr C Stephen Briggs

1. I recognize the need for and welcome your inquiry as prelude to a national debate on energy. It is here my purpose only to draw attention to matters raised by the development of wind farms.

2. Until 1995 I lived in Llangwyryfon, where in 1991 planning permission was granted to develop a windfarm. This was briefly reported upon for the first WASC energy report 1. Our home was, we believe, the closest ever built to 6 wind turbines (600 m), being within 350 m of 3. [The situation has since changed, as those turbines were replaced by larger ones, all further from inhabited dwellings than their predecessors].

3. We found two aspects of the 1991 development unsatisfactory: first, the process whereby planning permission is gained, and secondly, the means governing how developments are then monitored in the public interest.

4. Regarding the planning process, we found that there was a serious level of misrepresentation by developers which, it appeared, did not faze local councillors. They seemed not to notice the damage the developers did to local roads or that the promised local employment never materialized. That some local residents and farm animals were badly affected by the sound was put down to the instability of the victims, not the mendacity of the developers and the experimental nature of their tormentors. Neither did councillors seem to believe it necessary to understand what it was they were voting for—indeed, it is a matter of record that some of them slept through the presentation that preceded the vote. Like many others who have found themselves with a major development in their back yard, we soon discovered that it was impossible to challenge what seemed an unjust the system, without an expensive judicial review. The developers built and excavated in places they had not been given permission. These unscheduled works affected the endurance and purity of our water supply and let to permanent damage in the central heating system. Most of all, the development affected our peace of mind and divided the community.

5. My wife eventually became ill from the infrasound emitted by the turbines. As a result, we sold our home (we were “helped” by the developers, who gave us £7 towards our expenses, and, we believe, saw to it that our neighbours bought the house cheaply.) Just prior to our departure, we had Messrs Stoneman associates of Swansea University bring acoustic gear into the house and demonstrate that the house certainly did pick up non-audible sound, contrary to the advice the industry was then giving, and contrary to the predictions of the Environmental Impact Assessment and developers’ promises.

6. We have followed subsequent developments with some interest, and have seen many others encounter similar problems.

7. As an archaeologist working among windfarms, I am extremely concerned that although archaeological desktop surveys and watching briefs may be recommended in the planning process under TAN8 [cf PPG16], the nature of the ground on many of these sites—I think particularly of Cefn Cross—
often includes extensive tracts of peat bog. It seems very important here that cognizance be taken of this bog as an important information repository containing pollen, which upon analysis can enable documentation of climate and vegetation as far back as the end of the last glaciation (12,000–8,000 B.C.). A number of peat bogs are currently drying out at Cefn Croes without having been investigated. Aside from its implications to CO₂, this represents a serious loss of human and environmental archive resource. In similar vein, I believe the Institute of Field Archaeologists is at present making representations to WAG about the problems presented by offshore power stations. These arise because so little of the offshore shelf has been surveyed for ecology and archaeology and there are at present insufficient archaeologists trained in submarine work to undertake such surveys if they could be agreed in advance with developers. It is to be hoped your committee will take these problems into consideration when examining the potentially damaging environmental impact of most forms of energy generation. It is a matter of ensuring that a full record is made when deposits of national interest are threatened with damage or complete loss.

8. I therefore request that in considering the country’s energy needs, your committee gives serious consideration to the many aspects of energy generation that are not as yet properly understood. This includes windfarm sound and other types of pollution or developmental destruction. I furthermore earnestly request that your committee will make supportive recommendations to help pave the way to a more just planning system, one in which Planning Objectors have the right to appeal (as under the European Convention of Human Rights) in line with the way developers can appeal against Planning Refusal.

Note:
2 December 2005

Written Evidence from Campaign For The Protection Of Rural Wales, Ceredigion Branch

We submit the following in reference to the above Inquiry:

1. We regret that there has so far been no national debate on energy supply and conservation and welcome the present initiative by government.

2. We believe that the emphasis currently placed on developing wind energy in Wales is more a cosmetic gesture than a solution to the problems of runaway CO₂ emissions. These need urgently addressing through national policies encouraging efficient public transport and restricting air travel. Given available statistics for their performance and costs, we believe it is not reasonable to claim that further windfarm development is in the national interest.

3. We believe the national interest will be more appropriately served by encouraging and subsidizing individual endeavour to employ other forms of alternative energy and that government should urgently emphasise the need for energy conservation.

4. Having seen Environmental Impact Assessments associated with several recent planning developments and in particular with those relating to windfarms, we are concerned about their quality and therefore urge that serious future consideration be given to allocating government expertise to monitor them.

5. In regard to landscape, we find it worrying that government and its advisers currently apply such subjective criteria when evaluating landscape/environmental importance. We urge that greater recognition be afforded perceptions and appreciation of landscape and its significance by those communities which use and manage them at the regional and local level. This is not to suggest that landscape should not be designated significant nationally. When such designation applies, it should be respected by adequately protected against development.

6. As regards the planning system, in our dealings over windfarm applications in this county a handful of concerns apply. First, it is clear that few locally elected councillors are trained to understand the implications raised by many types of application processed in the planning system. We therefore urge that training be instituted to help redress this problem, if not to consider introducing written examinations on national planning policies as a condition for those making decisions about planning matters. We are also concerned in Ceredigion that we have to pay a fee for sight of planning files which we believe should be available free under the Freedom of Information Act. Furthermore, we have been disturbed to discover and regret to report that in processing applications, the Planning Authority has demonstrably acted partially by not appropriately maintaining complete records. Although we have not discovered this in relation to energy matters, such a practice diminishes confidence in government.

7. We recognize and lament the parlous state of farming nationally. We are, however, disturbed that current diversifications, like windfarms (but also including other activities) can be promoted under umbrellas which divide neighbourhoods and disturb community harmony.
8. We are dissatisfied that the nature of windfarm sound (and that of some other developments) is rarely addressed in the planning process, as we believe it is inadequately understood, and we know that it can have unpredictable effects upon humans. In specific instances, it is only discovered when the turbines are turning, by which time it is too late to help those affected.

9. Finally, since Cefn Croes was built, Ceredigion’s landscape appears strongly punctuated by wind turbines and the county now contributes a fair share to national generation targets. CPRW has a neutral policy towards some of the types of energy generation available. However, in Ceredigion though we share national concerns about addressing the government’s intention to reduce CO2 emissions, we believe it now vital to initiate promote and invest in serious energy conservation projects at all levels.

29 November 2005

Written Evidence from Richard Wilson, Cambrian Mountains Society

I am writing on behalf of the Cambrian Mountains Society, a charity whose objects are:

1. To promote, for the benefit of local communities, and of the wider public, measures which will sustain or enhance the landscape, natural beauty, biodiversity, archaeology, scientific interest, and cultural heritage of the Cambrian Mountains.

2. To promote awareness, knowledge and understanding of the Cambrian Mountains.

A major current concern of the society is the threat posed by major wind energy developments to the landscape, natural beauty, biodiversity, and scientific interest of the Cambrian Mountains. We also believe such developments to be damaging to the interests of the communities of the Cambrian Mountains, whose future viability will be increasingly dependent on those qualities of their environment which we seek to sustain and enhance.

We deplore the designation by the Welsh Assembly Government in its Technical Advice Note 8 of the Nant-y-moch Strategic Search Area, and shall oppose any major wind energy development arising therefrom, as we shall any other proposal which we believe threatens the integrity of the Cambrian Mountains.

We urge the Committee to discourage major windfarm developments in the Cambrian Mountains, and to promote a renewable energy strategy which does not involve the blighting of one Wales’ finest landscape assets.

1 December 2005

Written Evidence from Centrica

INTRODUCTION TO CENTRICA

Centrica plc. was formed in 1997 after the former British Gas plc was demerged to form BG Group and Centrica. In the UK, it trades under its brand names, British Gas, Scottish Gas and Nwy Prydain. It is the UK’s largest energy supplier, supplying around 11 million gas and 6 million electricity customers in the domestic sector and around 900,000 customers in the Industrial and Commercial sector.

To support its supply businesses, Centrica owns both gas and electricity production assets. In the UK, a significant but declining proportion is secured through its own reserves, chiefly the Morecambe gas field. As its UK reserves decline, the company is investing over £12 billion in new international gas supplies. Centrica also owns Rough storage facility through its subsidiary, Centrica Storage Limited.

Renewable energy is playing an increasing important role in Centrica’s energy portfolio contributing both to delivering diversity of supply and helping to meet the Government’s carbon emissions’ targets. The company has committed £750 million in developing both offshore and onshore windfarms.

Energy efficiency also has an important part to play in both reducing energy consumption and meeting the Government’s environmental goals. Across the UK, since 2002 the company has so far installed around 26.4 million energy efficiency measures such as loft and cavity wall insulation. The company also invests in fuel poverty programmes to help its vulnerable customers and those who find it difficult to pay their energy bills.

Centrica welcomes the Welsh Affair’s Select Committee inquiry which comes at a time when energy related matters such as security of supply and the forward outlook for gas prices high are on political, business and consumer agendas.
1. **Current and Future Energy Needs of Wales**

1.1 As with the rest of the UK, affordable, reliable and clean forms of energy are essential for Wales to meet the demand of both consumers and the economy. This has been considered in more detail in the Welsh Assembly document: “Energy Wales: Route map to a clean, low carbon and more competitive Energy Future for Wales.” A central tenet of this was that through its geographical and industrial structure there is real potential in Wales for major renewable projects and improving energy efficiency.

1.2 Gas also plays an important part in the electricity mix in Wales. Centrica owns Barry Power Station, a 230MW gas fired power station on the outskirts of Cardiff. The power station offers flexible operations, typically starting up and shutting down on a daily basis depending on capacity demand to meet the demands of Centrica’s customers.

1.3 Fuel poverty is a concern given Wales’s relatively high proportion of low income households and the age of the housing stock in some of its poorest areas. According to the most recent estimates, approximately one quarter of a million people in Wales are defined as living in fuel poverty. The Government’s Warm Front and energy suppliers’ energy efficiency schemes are helping to insulate the homes of vulnerable people. However, many in owner-occupied or privately rented accommodation are slipping through the net and more needs to be done if the Government is to deliver on its targets to eradicate fuel poverty amongst vulnerable groups by 2010 and amongst all groups by 2016.

1.4 Centrica remains committed to helping fuel poor households through its ongoing commitment to the Government’s Energy Efficiency Commitment (EEC) scheme and its “here to Help’ programme run in conjunction with Help the Aged and other charity partners, Centrica is also committed to improving the quality and warmth of social housing for those living in the most deprived areas. A number of schemes are operating throughout Wales and some 33,000 homes have benefited from direct assistance (mostly through installation of insulation) to date.

1.5 Domestic energy consumption has increased every year since 1980 with 25% of emissions coming from the domestic sector. Energy efficiency is the lowest cost carbon abatement tool, and will play an important role in ensuring that the Government’s carbon emission targets are met. Since 2002, British Gas has installed around 1.4 million energy efficiency measures in Wales through the Energy Efficiency Commitment.

1.6 However, so called “able to pay” householders are still not being motivated to invest in energy efficiency products. British Gas and a number of Local Authorities have been trialing a green council tax rebate. Under the incentive, householders who install £175 of cavity wall insulation receive a one off reduction of up to £100 towards their annual council tax bill. The "green home package" also provides a Home Energy Audit as well as energy efficient light bulbs to the value of £20.

1.7 So far Braintree Council, South Cambridgeshire, South Hams Council and most recently Taunton Deane Borough Council have all become involved in the scheme. We are in discussions with a further 20 Councils who are considering adopting the scheme. Initial take-up has been very encouraging, generating around 800 enquiries and insulation has been installed in over 300 homes. This clearly demonstrates that there is a clear incentive for energy efficiency products when linked to energy efficiency measures.

2. **Current and Future Energy Provision of Energy in Wales**

2.1 Centrica supports diversity of energy sources in meeting the UK’s energy requirements. It also believes that a UK wide-market based approach is best suited to meeting Government security of supply and environmental objectives. For example, the Renewables Obligation has been instrumental in incentivising investment in offshore and onshore wind, some of which are already operating and delivering energy to Wales. These include Westbury Windfarm Ltd’s onshore windfarm in Ceredigion and the North Hoyle offshore windfarm owned by NWP Offshore Ltd.

2.2 The construction of the Bacton-Zebrugge interconnector links us firmly to the North West European market and therefore to a wider North West European gas market, subject to influences from both the UK and Continental markets. It is now important to look at how the UK market might best integrate with a slowly converging European market.

2.3 Fully competitive energy markets brings benefits such as customer choice and better customer service and can result in downward pressure on prices and considerable savings for end-users. The UK represents an excellent example of the benefits that competition can bring. Since the introduction of competition, the average domestic gas bill in the UK has fallen by 18% in real terms, whilst the average UK domestic electricity bill has reduced by 11%.
2.4 The UK energy market is however facing some significant energy challenges. For decades the UK has been self-sufficient in gas, and indeed producing gas that was surplus to Britain’s energy needs. However, North Sea reserves of gas are declining more quickly than expected, which has resulted in the UK becoming a net importer of gas in 2004.

2.5 This is having a direct impact on gas wholesale prices which have reached unprecedented highs. Over the last three years wholesale gas prices have increased by over 180%. As a result, all energy suppliers have been forced to increase their consumer prices. In September 2005, Centrica increased its prices for gas and electricity by 14.2%.

2.6 Clearly higher energy prices have an impact on all our customers but particularly our vulnerable customers who are least able to afford higher prices. To offset the increase we have introduced a winter rebate of up to £60 for around 250,000 of our most vulnerable customers. To qualify for the rebate, customers need to be in receipt of specific Government benefits. The response to date has been good with around 140,000 customers qualifying for the rebate. Targeting also seems to be effective with over two thirds of customers being in receipt of two or more benefits. This is the biggest social initiative carried out by any UK energy company and comes on top of the existing £10 million British Gas Energy Trust which is helping customers in debt who need financial assistance to pay their bills.

2.7 As new gas supplies come on stream in 2008 then we would expect to see downward pressure on prices. New pipelines are being built linking the UK to Netherlands and Norway and the Interconnector from Belgium to the UK has recently been expanded. New LNG import facilities are also being constructed as are new storage facilities. Companies such as Centrica are investing in new long terms contracts to bring international sources of gas to the UK.

2.8 However, it is essential that EU energy markets liberalise and that there are no obstacles to the free flow of gas across Europe to the UK. The recent DG Competition preliminary findings highlighted the serious problems in European energy markets as a result of incumbent monopoly suppliers and lack of access to networks.

2.9 We are pleased that the UK Government has made EU energy liberalisation a priority of its UK Presidency of the EU and it is essential that it keeps pressing the European Commission and other Member States to ensure effective implementation of the Directives throughout the EU. In the meantime there is clear evidence that UK customers are paying for the failure of EU energy liberalisation. A recent report by Global Insight estimated this cost at £10bn per annum as a result of the oil linkage that remains in some long term contracts with Europe. These costs are feeding through to UK energy prices as the UK imports more gas from Europe.

3. RELATIONSHIP BETWEEN UK GOVERNMENT AND THE WELSH ASSEMBLY

3.1 Energy policy remains a retained Westminster power and Centrica believes that this should remain the case. We believe it is important to develop an integrated, broad energy generation and distribution strategy which reflects the need of all UK consumers and businesses as a whole.

4. CURRENT AND FUTURE PORTFOLIO OF ENERGY PROVISION IN WALES

4.1 Centrica believes that a mixed portfolio of gas supply and power generation is best served to deliver future security of supply. It is also important that the market and not the Government (devolved or otherwise) determine the “energy mix.”

4.2 However, intervention may be necessary to bring about results that a purely free market may not deliver. For example, the market may not favour less carbon polluting forms of power generation and in cases such as these, market based mechanisms such as the Renewables Obligation and EU Emissions Trading should be used. The EU Emissions Trading Scheme, for example, helps the transition to a low carbon economy happen at least cost to consumers.

4.3 Below we look at some of the technologies and generation sources currently being considered in relation to energy policy:

5. NUCLEAR ENERGY

5.1 Existing nuclear power stations in the UK currently meet around 19% of electricity demand. However, there has not been new build of nuclear power stations in Britain for over 10 years and as most reactors close over the next 20 years, this will leave only Sizewell B running until 2035.

5.2 Centrica has no fundamental issues with nuclear generation which for many years has delivered secure and carbon free electricity. However, nuclear build is not an easy option and does not come without serious problems.
5.3 There is still no solution as to what to do with the nuclear waste and we will have to wait until the newly formed Nuclear Decommissioning Authority (NDA) delivers its proposed solution in 2006. Waste has significant problems associated with it in terms of public opinion and long term safety. For the public to support large scale new nuclear build, it will be necessary to solve the outstanding long-term nuclear waste disposal issue. It is for the government to ensure that companies who own and operate new nuclear, do so in a safe and effective manner.

5.4 The time span involved to plan, build and make a return on investment for new nuclear build is longer than other forms of power and can take up to 50 years in total, (against the total product life cycle of a Combined Cycle Gas Turbine (CCGT) power station of 25-30 years). Investors would be wary of making such a long term investment in any sector let alone the UK energy market, which has been subject to numerous policy changes over the last two decades.

5.5 It must also be noted, that if a decision is taken to go ahead with a new fleet of nuclear power stations, when licensing, planning and building is taken into consideration, they would not be on stream for at least another 10 years. Therefore, new nuclear build will have little impact of security of supply and carbon reduction in the short-term.

5.6 To reduce the risk associated with new build, the government would have to provide either upfront subsidy or introduce a policy mechanism which forced retail suppliers to source a proportion of their electricity supply from nuclear stations. Both of these options would have a significant impact on the current liberalised market. Combined with the Government’s desire to increase the Renewable Obligation to 20%, adding some form of nuclear obligation on suppliers would mean that almost one half of the energy supplied by private companies would be dictated by Government policy.

5.7 This would act to reduce the ability of suppliers to compete with each other, thereby impacting the price consumers pay, as well as reducing the potential of suppliers to source the most efficient sources of fuel for power generation needs.

5.8 The impact of the EU emissions trading on the development of less carbon intensive power production should not be ignored. By rewarding electricity generators that produce less CO₂ for every unit of electricity produced, the EU ETS builds the price of carbon into the power price and thereby favours nuclear generation.

5.9 It is Centrica’s view that in addition to a decision on new nuclear build being made, real effort should be made to ensure the success of the EU ETS which, if allowed to work correctly, will deliver environmental savings at the lowest cost to the consumer.

6. LNG

6.1 LNG provides important diversity of gas supply sources for Europe, since it provides a way of transporting gas economically over longer distances. Currently the UK has only limited LNG import capacity at 4% of total supplies compared to 63% in Spain and 21% in France. With the construction of new terminals at the Isle of Grain and Milford Haven and the conversion of the LPG facility at Canvey Island this should increase to an estimated 20% by the end of the decade.

6.2 Although global LNG supplies are expected to be tight over the next few years, there are many new LNG projects under development (eg Nigeria, Qatar). Large scale liquefaction trains and bigger ships mean that the economics of supplying LNG have improved. Many new projects are expected to come on line in response to the high levels of gas prices, particularly in the US. With the construction of new regasification terminals in North America and elsewhere, the gas market is becoming increasingly international and the UK will have to compete globally for future LNG supplies.

6.3 In August 2004 Centrica announced a major 15 year LNG supply contract with Petronas of Malaysia. Commencing in 2007–08, the agreement will help to underpin the development of new import infrastructure, enhancing the UK’s security of supply and deliver approximately 45bcm over the lifetime of the contract. The construction of the plant at Milford Haven will undoubtedly be good news for the local economy through the creation of hundreds of skilled jobs and contracting opportunities.

7. Clean Coal Technology

7.1 With the rocketing expansion of the Chinese and Indian economies placing a heavy reliance on coal as a source of power generation, the importance of clean coal cannot be underestimated. International Energy Agency forecasts have indicated that some 38% of the world’s electricity will still be generated from coal by 2020.

7.2 While gas prices continue to run ahead of coal, it will continue to draw interest from acquisitive power generation companies. However, it might become comparatively unattractive to those contemplating the arrival of the more punitive phase 2 of the EU ETS. The key to its long term viability is the promotion of clean coal technologies.
7.3 With Wales’ history of coal mining, clean coal technology could play a key part in Wales’ future energy needs. The Uskmouth power station in Newport already utilises flue gas desulphurisation/FGS/and is one of the cleanest plants of its size in the UK. Additionally, the necessary consents to fit FGS to Aberthaw in the Vale of Glamorgan have been obtained.

8. WIND FARMS/RENEWABLE ENERGY

8.1 As a major supplier of electricity, Centrica has a significant Renewables Obligation which we plan to meet by developing our own renewable assets, negotiating purchase contracts with renewable generators and participating in the ROC market. Centrica is the only supplier that has met its ROC target for both of the first two compliance periods (April 2002–March 2003 and April 2003–March 2004) entirely using ROCs, without having to resort to the buy-out option.

8.2 Renewable sources of energy are important to UK security of energy supply. However it must be recognised that the Renewables Obligation is still in its infancy and it is therefore essential that there is no “tweaking” of the obligation in favour of one technology over another if investor confidence is to be maintained.

8.3 In 2003, Centrica announced investment plans of £750 million for developing renewable generation assets, and is currently developing a 26MW onshore wind farm in Scotland, has a 50% stake in a 90MW Round 1 offshore wind farm at Barrow, and two further Round 1 offshore wind farms about to be constructed at Inner Dowsing and Lynn, off the Lincolnshire coast. Centrica is also pursuing three large Round 2 offshore developments in the Wash, bringing the total capacity of investment plans up to 1500MW.

8.4 Although Centrica does not currently have any investment in wind energy projects in Wales, it is however aware of Wales’ potential suitability for development of Wind energy projects. As in other parts of the UK, many of the areas which might be considered suitable for development of on-shore Wind energy fall within the boundaries of National Parkland—eg—Pembrokeshire, Snowdonia and Brecon.

9. GEOTHERMAL/TIDAL AND WAVE/HYDRO ELECTRIC

9.1 Centrica has no such assets or planned acquisitions in Wales and believes that these technologies are still in their infancy and are not yet commercially viable

December 2006

Written Evidence from Wales TUC Cymru

The Wales TUC welcomes the opportunity to comment on the Welsh Affairs Committee “Inquiry into energy in Wales”. The Wales TUC represents over 50 trade unions who in turn represent around half a million members across Wales.

1. INTRODUCTION

1.1 The Wales TUC has placed a very high priority on the future of energy in Wales during 2004 and 2005. We have organised two high profile energy conferences in north and south Wales where public and private sector representatives heard from industry leaders, workers and energy experts.

2. THE CURRENT AND FUTURE ENERGY NEEDS OF WALES

2.1 The supply of energy in Wales is a crucial issue to the Wales TUC. The future development of Wales, economically, environmentally and socially, will be to a large extent dependent on how we plan energy policy during the next five years.

2.2 Of particular concern are Welsh employers having access to a stable supply of electricity at a price that enables them to be competitive and any supply being environmentally sensitive.

2.3 A secure and competitive energy supply is of particular importance to the Welsh economy, given the importance of manufacturing in our energy mix.

2.4 As most electricity in Wales is supplied via the National Grid, the electricity needs of Wales must be considered in the context of the supply and demand pattern in the UK as a whole.

2.5 We must also do more to improve our energy efficiency, which would help reduce our demand for energy.
3. THE CURRENT AND FUTURE PROVISION OF ENERGY IN WALES

3.1 In Wales, diverse and secure ranges of electricity generators produce electricity.

<table>
<thead>
<tr>
<th>Generation Sector</th>
<th>Terawatt Hours (TWh)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>12.401</td>
<td>41.37</td>
</tr>
<tr>
<td>Nuclear (Wylfa)</td>
<td>7.291</td>
<td>24.32*</td>
</tr>
<tr>
<td>Coal</td>
<td>7.116</td>
<td>23.74</td>
</tr>
<tr>
<td>Pumped Storage</td>
<td>2.064</td>
<td>6.88</td>
</tr>
<tr>
<td>Renewables</td>
<td>0.782</td>
<td>2.61</td>
</tr>
<tr>
<td>Other thermal</td>
<td>0.276</td>
<td>0.92</td>
</tr>
<tr>
<td>Oil</td>
<td>0.049</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Source: Our Environment, Our Future, Your Views (WAG 2005)
At full capacity, Wylfa can produce 8.6 TWh or 27.5% of Welsh generation.

3.2 The forecasts for electricity demand and supply in the UK until 2020, as quoted in the DTI/Ofgem JESS report, indicate that a much higher proportion of the UK’s electricity requirements will be produced from gas fired power stations (65%) than is presently the case. This is due to the planned retirement of the older generation of nuclear power stations and the expected reduction in coal-fired capacity.

3.3 Approximately 41% of electricity generated in Wales comes from gas-fired stations. When Wylfa nuclear power station closes in 2010, and assuming the proposed gas-fired power stations at Milford Haven and Uskmouth come on stream in that time, that percentage will rise to approximately 50%. On present trends this dependence will continue to increase.

3.4 The closure of Wylfa will remove 8.6 TWh of capacity from Wales (28% of present Welsh generation) and will make North Wales a net importer of electricity. South Wales is presently a net importer of electricity and bears the highest electricity costs in the UK because of the high transmission costs.

3.5 Given that the industry estimate is 80–90% of gas used in the UK will be imported as North Sea reserves are progressively depleted, consideration has to be given to the source of the gas and whether that supply is stable. If the UK depends upon gas for 65% of its electricity supply then it is clear that disruption to the supply of gas would have dire consequences to the economy and society of the UK and Wales.

4. THE RELATIONSHIP BETWEEN THE UK GOVERNMENT AND THE NATIONAL ASSEMBLY FOR WALES—INCLUDING THE DIVISION OF POWERS—ON ENERGY POLICY

4.1 The Wales TUC believes that there needs to be a clear framework for energy policy in the UK within which the UK Government and the National Assembly for Wales can operate.

4.2 The Wales TUC believes that pre-legislative scrutiny by the relevant National Assembly Committees for any future energy bills should be considered.

5. THE CURRENT AND FUTURE PORTFOLIO OF ENERGY PROVISION IN WALES

5.1 The Wales TUC supports the development of a long-term energy policy framework. We cannot simply depend on imported gas. The Government should consider incentives for investment to ensure early development of new generating capacity in all lower-carbon technologies, including renewables and clean coal.

5.2 Fossil fuels: We support the increased use of carbon abatement technologies that can secure clean coal energy production in Wales and the spin-offs this will bring to our indigenous coal industry. We believe that if the UK wants to make a significant contribution towards cutting greenhouse gases we need to build more clean coal plants in the UK and then export the technology to the major coal users, such as China and India. We support the use of gas, the Pembrokeshire LNG development and oil as an integral part of a balanced energy policy.

5.3 Nuclear energy: With Wylfa power station in Anglesey, currently supplying over 25% of Welsh electricity, scheduled to retire in 2010, that gap will need to be met by new sources just to stand still. There are significant issues that need to be addressed if the establishment of new nuclear generating capacity is to be considered but we believe that if the economy and society of Wales is to prosper, the possible use of nuclear power has to be fully explored. Underpinning all these requirements is the need for positive action to maintain and renew the nuclear skills base. There are pressing needs to rebuild the extensive knowledge and expertise that has been lost from the nuclear industry in recent years as well as to replace existing skilled staff due to retire in the next few years, even if only to deal with decommissioning and management of existing radioactive waste.

5.4 Wind power: Both on and offshore, wind power needs to be part of any energy mix and Wales is geographically well suited for the construction and operation of wind derived power. Of all the renewables sources, wind technology is also likely to produce the most jobs in the immediate future if the manufacture of wind turbines is carried out in Wales.
5.5 Tidal and wave energy: Similarly, Wales is amongst the best tidal energy sources in the world, and it is highly predictable. The significant potential of tidal lagoon technology should be explored further. Wave energy is driven by wind, and is a significant potential source of energy. We believe that an urgent re-evaluation of the potential for a barrage across the River Severn needs to be made, with its potential to generate 17–19 TWh per year of clean, carbon free electricity. We are aware of the environmental concerns that arise from building barrages and these would need to be assessed.

5.6 Carbon capture and storage: Wales TUC supports the increased use of carbon capture and storage. Instead of being vented into the atmosphere from power stations, carbon emissions could be liquefied and pumped back out to the North Sea’s emptying oil and gas reservoirs via a disused gas pipeline.

December 2005

Written Evidence from Francis John Golden

The above Inquiry is focusing on the cost, cleanliness, efficiency and sustainability of existing energy sources in Wales. In addition to consider the merits of newer forms of energy provision.

One source of energy that has not been exploited at all in Wales and could be considered as a “newer form of energy provision” is msw—municipal solid waste.

*The calorific value of coal is 28Gj per tonne, that of rdf: refuse-derived fuel (dried msw after metals, minerals and hard plastics extracted for recycling) is about 20 Gj per tonne. By comparison oil is 46Gj per tonne and nearly all plastic about 39Gj. LNG is about 40Gj per tonne.*

*Environment Agency—Energy content of materials. 2005

The past custom of landfilling msw and plastic is shewn as a considerable waste of what should be recoverable energy from a sustainable source.

Recognising that recovery of this energy by incineration is not welcome due to concern about emissions and the intrinsic inefficiency of mass burning, several engineering companies** developed more efficient and environmentally benign thermal solutions, viz. pyrolysis and gasification.

**Of these only Compact Power and GEM, with UK patented technologies, remain.

To encourage development of these the then Energy Minister Mr Wilson in 2002 brought in the RO (Renewable Obligation) adding that the UK had lost out on the engineering opportunities offered by North Sea oil in the 1970s and did not want to make this mistake again.

Apart from plant and forestry fuel that could be incinerated, the RO was and is restricted to non-fossil fuel derived waste converted by the Advanced Conversion Technological processes of pyrolysis, gasification and anaerobic digestion. It was therefore announced that processes creating energy from non-fossil fuel derived waste utilising ACT (Advanced Conversion Technology) would be entitled to a ROC (Renewable Obligation Certificate) for every MW generated. Each would have an initial value of £30, but would escalate each year to guarantee a return on capital invested and establish a new, British industry.

MSW is a heterogeneous waste. Picking and mechanical extraction processes can recover the cans, glass, plastic containers and minerals, but no process can completely extract the remnants of plastic film: that is still entrained in the residue.

To full entitlement to ROCs the UK Regulations require that no more than 2% (of plastic) by calorific value can be entrained. That is virtually impossible to achieve. That is now being recognised by the DTI in the Renewable Obligation consultation and consideration is being given to extending this to 10%. Ireland appears to be going in this direction as well, but is giving thought to having the entrained plastic be measured by weight rather than calorific value.

The original initiative by the DTI has, to all intents and purposes, failed to live up to expectations. The imposition of the 2% “contamination” limit of MSW has in fact restricted the RO (in respect of waste) to biomass only and done nothing to divert waste away from the landfill.

The two companies remaining are:

Graveson Energy Management, ie GEM:—pyrolysis, ie air is excluded and the prepared fuel is “flash” converted at about 820c. There is no need for a tall stack. Dioxins and furans are not created.

Compact Power:—pyrolysis, gasification and incineration (to burn off the emissions).

All the other companies have ceased or dormant.

(There are other companies now in play, they are claimed to be starved air, ie gasification, but are they little more than incineration?)
In three years there has been little progress.

Compact Power has recently been granted planning consent for a 25,000 tonne demonstration plant at Bristol.

GEM has planning consent in a major poultry firm in Norwich: a plant using chicken litter as fuel to generate in the first phase 2/3 Mwh of electricity and the same in useable heat, then in the second phase 10 to 12 Mwh plus the same in useable heat. Also, enabled with a DEFRA grant, a demonstration plant to treat 25,000 tonnes of prepared msw is likely at a site near Scarborough.

To date Compact Power received £3,000 in state aid and spent £20 million and has an operating plant at Avonmouth treating hospital waste.

Graveson Energy Management, GEM, Romsey has had no state aid, but spent at least £8 million and a ½ size pilot plant operating at Romsey since 1999.

Handicaps to development are:

- Procurement procedures for local authorities not stipulating ACT.
- Uncertainty about “new” technology.
- Banks require contract in place. LAs will give this only if funds are in place, ergo, little movement away from landfill.
- Financial incentive of the ROC not achievable for the above reasons.
- Major waste operators own landfills.
- The application of the Waste Incineration Directive to a pure pyrolysis process like GEM where there is “incineration” only in the reciprocating engine powering the generator.

The 2004 DEFRA scheme to provide support funding to ten applications involves incredible expense to the applicants while changing the conditions so that any support funding will not be for initial construct, when these companies really need it, but rather to the running once its built. The awards already given seem to have gone to the tried and tested rather than genuinely innovative British technology.

GEM is intending to make a planning application in Wales. The site in question has road and rail links. Prepared msw, with mechanical pre-sorting and drying preferentially at LA facilities would be converted and 50,000 tonnes would deliver eight to 11 Mwhe plus the same in useable heat to the grid. The ash, at about 10% could be incorporated into concrete blocks (similar to well known thermolite blocks from main power stations) and nothing going to landfill sites.

Once up and running it will make a significant impact on the waste diversion and renewable energy scene. At that stage consideration could be given to stripping off the hydrogen from the synthetic gas for research into road or other use.

In the Waste Strategy composting is frequently the preferred option for green and non-fossil fuel derived waste. The residue or fibre produced by these MBT, aerobic and anaerobic patent processes is likely to be spread as cover on landfill. There it decomposes and produces methane. One tonne of which is equivalent to 20 tonnes of CO2. It is better to reduce these emissions rather than increase them. The residue when dried down to about 5% moisture would be an excellent fuel for the GEM pyrolysis process. So would the hospital plastic that is currently sterilised then put to landfill.

Pyrolysis is the most efficient of the three thermal technologies. If all the waste going to landfill in Wales was prepared as fuel for GEM converters most of the energy problems would have a solution. Accompanied by recycling, most of the landfill diversion problems would be solved as well.

**TERMS OF REFERENCE:**

- 1. UK Gov. policy
  
  If each landfill or civic amenity site had a waste fuel preparation and GEM power station connected, that would provide a continuous rather than intermittent (wind) source of green electricity. This would make the balancing needed by the grid that much controllable and reliable.

- 2. More delegation to Wales could ensure that Wales’ Local Authorities be encouraged to direct that waste be prepared for utilisation as a fuel for ACT.

- 3. The current portfolio has no provision for ACT generated electricity. Ensuring that that was included could make a major addition to the future portfolio.

29 November 2005
Written Evidence from Catrin Edwards

I understand that the Welsh Affairs Select Committee is undertaking an Inquiry into Energy in Wales. I write to inform you of my grave concerns in relation to the Welsh Assembly Government’s race to cover much of upland Wales with wind turbines, and Powys in particular.

I live 12 miles south of Newtown, within TAN 8 Strategic Search Area C. TAN 8 is, as you know, a Technical Advice Note from the Welsh Assembly Government to be used as a guidance document for local planning authorities on how planning applications should be dealt with. Because it is advisory it cannot be mandatory yet it implies that there is a foregone conclusion that wind generation is the way forward in solving our energy needs.

This particular TAN was published in draft form in July 2004 and although certain organisations were circulated, Community Councils were not sent copies thus preventing consultation with local people. As a Community Councillor myself, I find this lack of democracy appalling. Now TAN 8 is published, Planning officers and County Councillors, regardless of their statutory duty to preserve the countryside, are expected to rubber stamp the proposals. Further, Carwyn Jones AM, WAG Minister for Environment, Planning and the Countryside said, when interviewed by the Powys County Times earlier this year, “There is no legal provision for a public inquiry.” WAG is disregarding public opinion and pressuring Councillors to do the same.

The understandable concern about global warming is shared by us all, but it will not be solved by industrialising rural Wales with giant wind turbines and the accompanying infrastructure. Some of the reasons why wind farms are not the answer can be summarised as:

— supply of energy is unpredictable, depending on whether the wind is blowing.
— need to keep existing power stations functioning due to the unpredictability of wind.
— extremely costly to produce compared with other forms of energy production.
— the number of turbines required to replace one power station is put at 500 thus causing widespread visual disturbance.

The technical considerations will be sure be covered by others who are more knowledgeable than myself but the result of this reliance on wind power will be the destruction of large areas of some of the most beautiful parts of Mid Wales. One of the Assembly Members for this area told me just two days ago that there are 30 planning applications for turbines ready for submission in Montgomeryshire—unfortunately I do not know the number for Radnorshire. The result of such a proliferation of wind farms, grid connections and access roads would be catastrophic to the environment. Our countryside would never be the same again. Tourism, which this area of Radnorshire depends on, would be affected. There would certainly be very little employment for local people—the large site at Llandinam employs just two maintenance workers.

WAG seems to be making little effort to invest in other technologies available such as biomass, photovoltaic technology, tidal stream, wave power and tidal barrage so that these may be developed commercially. It should also do more to encourage Welsh companies, the public sector and the Welsh people to be more energy efficient. Both WAG and the Select Committee must consider Nuclear Power stations as the way forward.

December 2005

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Written Evidence from Alison Davies, Chairman of Conservation of Upland Montgomeryshire

I am a partner with my husband in a 88 hectares farm in Montgomeryshire, sited within Strategic search area Carno North. Grid ref: SH994033.

We have lived at Carreg y Big since 1983 and have never had mains electricity due to the prohibitive costs quoted by Manweb (currently about £50,000). We have a small wind turbine and run a generator. Perhaps due to our isolation we are constantly aware of consuming resources and of production of waste and make every effort to minimise our consumption and only put approximately four bags of rubbish for collection each year.

We were approached by Manweb Generation Holdings in 1992 who wished to build a windfarm on land which included ours. After some heart-searching and research into windfarms, climate change and greenhouse gasses we concluded that we had no alternative but to oppose the development and any future proposals.

An anti-windfarm group was formed by local people; due to the other impending applications in the area this developed to become Conservation of Upland Montgomeryshire/Cadwriaeth Ucheldir Maldwyn in 1995. The group currently has over 300 members but this is growing quickly since TAN 8 was agreed. Having attended four Public Inquiries in 1999 and 2000 and having received the Planning Inspector’s reports which recommended refusal of two of the three applications and making strong comments regarding cumulative effect on the fourth; many local people had hoped that they had seen the back of this threat to our
lives and land. Regrettably this is not the case, and despite there being over 1700 letters to the consultation on TAN 8 it has been agreed, almost unchanged. This has left us feeling that the democratic process has serious flaws we have been ignored, despite always having behaved correctly and within the confines of the law.

1. UK Government Policy in Relation to

(a) the current and future energy needs of Wales

The critical issues that need to be addressed are, I believe, reliable power for every property, whether this is a private home, a business or a public building. There has been very little attempt to reduce the energy needs of Wales. It is well documented that in Holyhead in the early 1990s Manweb provided each property with low energy light bulbs, thus reducing consumption to such a level that considerable cost in capital works and upgrading cabling was no longer necessary. Solar tubes are still considered to be innovative and are not encouraged in standard buildings.

(b) the current and future provision of energy in Wales

Due to the isolated nature of some properties in rural Wales and the disproportionate density of population along the M4 and A55 corridors we have to look at a variety of solutions; some small stand alone systems, some that are for whole communities and utilise the generation of heat from the property itself, providing the opportunity to sell excess to the national grid if that connection exists. The fact that there are still farms in Wales that have no mains electricity is disregarded and when brought to the public’s attention, it is generally treated with some disbelief and assumptions are made that we live without 240 volt electricity, have to purchase a gas fridge at excessive cost and pay £15 for a single low voltage light bulb as some kind of life choice!

2. The Relationship Between the UK Government and the National Assembly for Wales—Including the Division of Powers—on Energy Policy

It is of very great concern to many that the Government, National Assembly and Local Government all seem to forget their responsibilities to the Wildlife and Countryside Act 1968 and take forward policies that directly destroy this country which they have a legal duty to protect.

It is difficult to see how the National Assembly can really hold any power when they allow themselves to be pushed into a position where they produce and publish a draft TAN 8 when they have no Energy Policy—and this is justified by the fact that Westminster has one. The political drivers for windfarms are within the Deputy Prime Minister’s Office and seem to have little to do with the reduction of greenhouse gases. When the meeting was held at the DTI to put forward PPS22 to the Local Authority Heads of Planning there was considerable consternation and at one stage a question was responded to on behalf of the Deputy Prime Minister’s Office; the person who responded was Marcus Trinnick the legal advisor for National Wind Power. I personally do not consider that this is appropriate and would ask why there is this excessively “cosy” relationship between developers and the government? In Wales, National Assembly Sustainable Energy Group meetings are held regularly throughout the year. At one of these meeting held, I believe in April 2003 I was appalled to learn from Dulas Engineering, who are based in Machynlleth a description of their method of working. They promote their training on renewable energy in relation to planning, to the various planning authorities throughout England and Wales. They are contracted to carryout training sessions with Planning Officers, and they told us how, at the beginning of the sessions, the Planning Officers were reluctant to find areas suitable for windfarms in their “patch”; However, after a full day of work with them the Dulas Engineering staff were pleased that the POs were always able to identify large areas that would be suitable for such development. Following the training, Dulas staff collected all of the maps that the POs had used and on which they had marked potential sites, they took these back to Machynlleth and carried out further desktop studies and then returned to the areas to ensure that there were no houses etc that could hinder development. They were pleased to report to NASEG that following this work they passed the information they had obtained to developers. I was personally appalled at this but they were applauded by the majority of people, including the Assembly Members present.

We are very concerned that Community Councillors, County Councillors and Assembly Members have interests, sometimes pecuniary, in windfarm development and the Community Councillors and County Councillors step far beyond the boundary of correct behaviour, for example by pressurizing their neighbours to support windfarms and not to speak out against their neighbours; the issues of Welshness and Welsh language are frequently mentioned.
3. The Current and Future Portfolio of Energy Provision in Wales Including

As a group we do not feel able to comment upon other forms of energy, although areas of expertise are within the group. Our joint concern, however, is that the “big hitters” such as clean coal technology have been available for some years, and without the will of governments across the globe to share their technologies any small changes made in one country will be wiped out by the increased emissions in other countries.

(d) wind farms

Having had to become involved in the fight to protect our hills from the proliferation of windfarms for over twelve years we have gained some knowledge and expertise. Our objections are based on the following points:

— Windfarms will never be an alternative to nuclear power stations and still many years on the general public still imagine that this is where the choice lies. The public do not realise that the aim is to reduce polluting coal fired power stations.

— Windfarms are now agreed to be detrimental to a landscape (see Planning Inspector’s Report—Montgomeryshire Cumulative Effect 2001); so the question is now, whether the detrimental effect is within an acceptable level.

— Houses near windfarms are of reduced value. I have a written valuation for our property to demonstrate this.

— Communities are divided into those “for” and those “against”. This is made worse as those “for” are either farmers who want them on their land or their relatives who are afraid to go against them (they have personally told me this), or neighbours who are again afraid to go against them. This means that the people who oppose the windfarms are the brave souls who have been born and bred in the area and are prepared to stand up to their neighbours and considerable pressure and unpleasantness; and people who have moved into the area, don’t have the family ties, and are often from professional backgrounds and have an understanding of the planning process.

— Many people in the area are not used to writing letters—it is common practice in rural Wales for people to hand their cheque books over for the vendor to complete and the purchaser will just sign the cheque. These people find writing formal letters to be outside their experience.

— There are currently three windfarms in Montgomeryshire; two large, highly visible turbines at the Centre for Alternative Technology; one windfarm under construction; there are also 11 proposals for windfarms.

— There is considerable pressure to look at community benefit; a County Councillor, whose husband is a significant landowner in one of the eleven proposals informed me that the money coming to the community from the windfarm proposal was “astronomical” (£30,000!) and that they would have a similar amount from the other local scheme. The Councillor had already allotted the money before the application has even been submitted. Councillors have exerted considerable pressure on some members of the community, to support windfarms.

— It is evident that a small proportion of the population are very easily “bought”; and they can be bought very cheaply indeed. It is particularly galling that having won the Public Inquiry in 2001 we are having to fight for our homes and livelihoods because the Government and National Assembly; with excessive regard for certain pressure groups and multi National industry, have chosen to disregard their obligation to the countryside and are still not making any significant impact on reduction of CO₂ emissions. This could have been achieved through a carbon tax and through compulsory energy saving measures.

— In Denmark; despite government support to produce 20% of their electricity from windpower, CO₂ emissions have in fact increased. (Platts’ Power in Europe.)

— The local authority does not appear to be able to meet the demand for its resources, so surveys and studies are not always able to be carried out by the Council to verify the data provided by the developers.

— The requirement for high quality EIAs is still not there and the documents provided continue to be a justification for their plans, not an assessment of the impact of the scheme.

— Our group comprises of very concerned people who really do care about the environment—the whole environment and that includes the non-renewable Welsh landscape and countryside.

December 2005
Written Evidence from RDC Developments Ltd

1. INTRODUCTION

1.1 RDC Developments Limited (RDC) welcomes the opportunity to submit written evidence and contribute to the Welsh Affairs Select Committee’s inquiry into energy in Wales. With such a prominent national and international debate on energy production, it is timely indeed that the Committee examines this issue. Our response to the enquiry specifically addresses the following points:

1b. UK Government policy in relation to the current and future provision of energy in Wales

2. The relationship between the UK Government and the National Assembly for Wales—including the division of powers—on energy policy

3d. The current and future portfolio of energy provision in Wales (specifically relating to) wind farms

1.2 RDC was established in 1996 with the objective of developing renewable energy projects and specifically wind energy projects throughout the UK. Our company expertise extends across the whole of the UK, but we remain a Welsh-based company. Based in Mold, North Wales, RDC has, with project management support from its sister company West Coast Energy, been successful with partners in securing over 400 MW of consented wind energy projects within the UK. This has been achieved by building innovative partnership arrangements and maintaining a commitment to a proactive and enabling approach to wind energy generation.

1.3 In Wales, in partnership with GE Energy, RDC was responsible for securing consent in 2002 for the 58.5 MW Cefn Croes Wind Farm in Mid Wales. Cefn Croes remains the largest consented onshore wind farm in Wales (in terms of installed capacity) and was officially opened in June of this year by Andrew Davies AM, the Minister for Economic Development and Transport of the Welsh Assembly Government. This was also the first successful windfarm application under section 36 of the Electricity Act 1990.

1.4 We were also able to secure the consenting of the Rhyl Flats Offshore Wind Farm later in 2002, one of the most innovative new energy schemes in Wales. With thirty turbines generating over 100MW, the Rhyl Flats consent was a bold and successful response to the drive of the UK and Welsh Assembly Government to harness wind power in a new way.

1.5 RDC recognises that the outcome of this inquiry will be critical for the future composition and security of energy in Wales. Responding to this report is also a further opportunity for the Welsh Assembly Government to maintain and strengthen its commitment on renewable energy and its vision of becoming a global showcase for clean energy production and efficiency.

2. THE RELATIONSHIP BETWEEN THE UK GOVERNMENT AND THE NATIONAL ASSEMBLY FOR WALES

2.1 The Welsh Assembly Government’s ambitious targets of 4TWh per annum of renewable energy production by 2010 and 7TWh by 2020 should be achievable considering the wealth of the renewable energy resource available in Wales. However, we are all aware that the theoretical resource available to us will never be fully exploited due to technical, environmental and land use constraints. It is therefore vitally important that where the exploitation of this resource is deemed to be technically and environmentally acceptable by developers, the assessment and consenting process is effective and efficient.

2.2 The current discussions regarding the possible transfer of powers to the Welsh Assembly Government in relation to Section 36 and 37 of the Electricity Act 1989 is therefore noted with interest. RDC would in principle have no objection to this transfer but would urge decisive action by the UK Government and Welsh Assembly Government on this matter in order to minimise any delays to the attainment of renewable energy targets. RDC would welcome the opportunity to comment further on the details of such proposals in due course.

3. DELIVERING ON RENEWABLES

3.1 It is generally accepted that the achievement of the 2010 renewable energy target will rely heavily on the onshore wind sector. The publication of TAN 8 in July 2005 demonstrates the Welsh Assembly Governments commitment to this target by concluding that an additional 800MW of onshore wind energy generation should be sited in Wales.

3.2 RDC consider that there are two main issues to note regarding the industries ability to deliver 800MW of additional generating capacity in Wales by 2010.

(a) Electrical infrastructure strengthening.
(b) Public perception of wind energy.
3.3 Energy infrastructure strengthening is stated as a priority action in a recent consultation document, “Energy Wales: Route Map to a Clean, Low Carbon and More Competitive Energy Future for Wales”. RDC agreed that this is a priority action in its response to the consultation document but considered that the wording of the associated Key Task “Encourage Mid and North Wales electricity grid strengthening” itself needed to be strengthened.

3.4 Major strategic investments are required to provide the electrical grid infrastructure in Mid and North Wales as a precursor and facilitator for the connection of renewable energy projects. This process is already underway in Scotland, with significant expenditure approved by OFGEM to reinforce the transmission network and interconnector. A similar process should be undertaken in Wales without delay but there are major regulatory barriers which need to be overcome to enable Wales to meet the renewable energy targets it is very capable of achieving. This will involve the Assembly actively lobbying and potentially getting involved in the financial arrangements of such strategic investments.

3.5 Numerous public attitude surveys have shown that the majority of people in the UK are in favour of wind energy. One such survey, commissioned by the British Wind Energy Association (BWEA) as part of their “Embrace the Revolution” campaign in Wales was announced at the official opening of the Cefn Croes wind farm in June 2005. This survey revealed that 75% of the people in Wales believe that wind farms are necessary to help the country meet its current and future energy needs. Further, polling by BBC Wales’ “Dragon’s Eye” in November 2005 also pointed to a favourable reaction to land based wind production. However, wind farm applications continue to be met with objection, invariably causing delay.

3.6 With the publication of TAN 8, and the Strategic Search Areas contained therein, there is a danger that the communities within or nearby the Strategic Search Areas will become hostile to the focusing of large-scale developments. This will be a challenge for the National Assembly, the Local Authorities concerned and the wind industry—but it is a challenge which must be met. RDC strongly believe in public consultation throughout the development process, but suggest a more overarching communications campaign, lead by the Welsh Assembly Government, may be appropriate to convey the “bigger picture” of climate change within Wales. I note the DEFRA initiative launched in November this year “Tomorrows Climate Today’s Challenge” and the BWEA initiative “Embrace the Revolution” as two good examples of current communication campaigns that the Welsh Assembly Government could build upon.

3.7 RDC are currently in the process of commissioning an independent survey to look specifically at the post construction local public perception of the Cefn Croes wind farm, the largest operating onshore wind farm in Wales. This research will build on the survey work undertaken at the time of Cefn Croes (3.5) and would be an innovative step forward as there is little Welsh-based evidence on public attitudes after the construction of wind farms.

3.8 RDC would welcome the opportunity to present these research findings to the Committee in due course; and to respond in more detail to any of the points raised in this proposal.

Contacts:

Gerry Jewson is Managing Director of RDC Developments Ltd and West Coat Energy Ltd. Between 1993 and 1996 Gerry was employed by Manweb Plc and was responsible for management of the company’s renewable energy business. During his 11 years in the wind energy sector Gerry has overseen the successful development of over 400 MW of wind energy capacity within the UK. In 2002 Gerry was awarded “Developer of the Year” by the British Wind Energy Association.

December 2005

Written Evidence from Mynnydd y Gwynt Ltd

1. INTRODUCTION

Mynnydd y Gwynt Limited is pleased to submit this evidence to the Welsh Affairs Select Committee for their Inquiry into Energy in Wales. The company faces windfarm development issues in respect of TAN 8 guidance on the siting of windfarms and would appreciate the Committee’s consideration of possible solutions.

As this case is unlikely to be unique, it would seem appropriate that the Committee might consider it as part of their inquiry. The degree of flexibility or discretion that local authorities may adopt in their implementation of the TAN 8 is likely to play an important role in helping Government to achieve its 2010 renewable energy targets. Public consideration by the Committee of the circumstances of the Mynnydd y Gwynt proposal could therefore greatly contribute to this wider debate.

22 www.bwea.com/media/news/wales.html
2. BACKGROUND

Planning Policy Wales—TAN 8 Planning for Renewable Energy

In July 2005, the Welsh Assembly Government published the Technical Advice Note 8, known as “TAN 8”. This document supplements Planning Policy for Wales and the Ministerial Interim Planning Policy Statement (MIPPS) on Renewable Energy.

TAN 8 provides detailed guidance on the siting of windfarms. The strategic assessment of the opportunities for major wind power capacity in Wales is based on the premise that there are environmental, landscape, technical national security and economic constraints that will determine the location of major wind power proposals.

TAN 8 proposes seven “Strategic Search Areas” (SSAs A—G) for preferred wind farm locations. Indicative targets have been set to achieve at least 800 MW of onshore wind generation. The SSAs have been designated to maximise efficiency, to allow investment in distribution infrastructure and to minimise environmental impact.

Mynnydd y Gwynt Limited wishes to develop a wind farm in Mid Wales to contribute to Government renewable energy objectives. However, the restrictive terms of TAN 8 are such that the Company is seeking support to allow Powys County Council and the Welsh Assembly Government to vary and/or substitute part of an SSA to reduce environmental impact and achieve certain delivery of renewable energy targets.

As such, this case highlights the potential limitations to windfarm development which may result from overly rigid interpretation of TAN 8 guidelines. The Company believes this is therefore relevant to discussion of renewable energy in the Welsh Affairs Select Committee Inquiry into Energy in Wales.

3. THE PROJECT

The company, Mynnydd y Gwynt Limited, is proposing to develop Mynnydd y Gwynt Windfarm in Mid Wales located at Y Foel and the Sweet Lamb Rally Complex, Glanrhyd, Llangurig. It will comprise 27 x 3 megawatt turbines to be erected on 2000 hectares of agricultural land. The purpose of the development is to generate 75MW per annum of electrical power without releasing carbon dioxide to the atmosphere and thus assist the UK meet its target for the reduction of greenhouse gasses under the Kyoto Protocol.

The windfarm will involve the development of less than 6 ha for the turbine bases and access tracks on upland grazing land, all within a 2000 hectare site. The site is located in the Cambrian Mountains at the head of the River Wye, approximately 20 miles east of Aberystwyth and 5 miles west of the nearest settlement, Llangurig. The highest point of the site is Y Foel at 546m.

A full Environmental Impact Assessment (EIA) of the development in relation to humans and sensitive landscape and ecological areas is being prepared. The site is well placed with access to the national trunk road network direct from the A44.

The site is subject to a Tir Gofal agreement and is principally in agricultural use. There is an extensive track network within the site and this is used as a Motor Rally Centre. This is an example of a successful farm diversification business, providing training and testing facilities for rally teams and individuals as well as having a variety of competitive layouts.

Development of Mynnydd y Gwynt offers a unique opportunity to meet Government renewable energy objectives whilst reducing environmental impact elsewhere in Mid Wales. For these reasons, Mynnydd y Gwynt was originally prioritised for inclusion in a TAN 8 Strategic Search Area. At the time however, the site was subject to a Ministry of Defence objection in respect of flightpath designation. Following detailed consultations concerning design and turbine types, the MOD objection has now been withdrawn. However, this decision was reached too late to include Mynnydd y Gwynt in the relevant TAN 8 Strategic Search Area.

The proposed site is thus currently not included in Strategic Search Area D, although it lies immediately to the eastern boundary of the Area. In order to proceed, the developers would need agreement by the local authority, Powys and the Welsh Assembly Government to extend SSA Area D.

At present Welsh local authorities are operating strictly within the TAN 8 guidelines of the SSAs. The developers are seeking local authority, Welsh Assembly Government and Parliamentary support to extend Area D and/or substitute Mynnydd y Gwynt with part of SSA Area B or C, by demonstrating that Mynnydd y Gwynt would have less environmental effect than developments in these areas.

4. STRATEGIC SITE AREA D

TAN 8 allows for the refinement of an SSA by local planning authorities and the developers hope this can mean an extension of SS Area D. However, under TAN 8, land adjacent to an SSA can only be considered for windfarm development where it has a lower or equivalent environmental footprint than other land within the local SSA.
Mynydd y Gwynt (at Y Foel OS reference 283346 285077) was initially considered for inclusion in the Nant y Moch Strategic Site Area D. It has a capacity to generate in excess of 75MW. As stated above, it was ruled out simply because of an MOD objection that has since been rescinded. As a result, Area D now encompasses land to the west of the Plynlimon Ridge.

The site at Mynydd y Gwynt performs better on all counts than land to the west of Plynlimon Ridge in relation to the criteria in TAN 8 because it will have a lower impact on the Snowdonia National Park and the important settlements of Aberystwyth and Machynlleth.

However, a situation has arisen whereby because Area D has now been defined that Mynyddy Gwynt land that has been in the original area cannot now be considered because it would extend the visual effect of turbines, albeit into a remote, sparsely populated area to the east.

This exact application of the designated SSA area is to ignore the fact that the Mynyddy y Gwynt site performs better than the land in the current Area D for the following reasons:

- Mynyddy y Gwynt meets all the criteria for a Strategic SSA listed in TAN 8, combined with a high windspeed (9 m/s) and most importantly, an existing access and track network that is substantially complete, meaning that the site can be developed with minimum additional landscape impact.
- The site could make a contribution of 75MW of installed capacity (over 50% of identified Area D potential) and would reduce the pressure on sensitive landscapes within Area D.
- Land within the SSA D, the Nant y Moch area, is very remote and has few access points. Developing land within SSA D would require construction of a significant number of roads that would affect the landscape of this remote and wild area.
- Mynyddy y Gwynt is visually constrained by the Plynlimon ridge to the west and north. This prevents any visual intrusion into the National Park to the north and to the towns of Aberystwyth and Machynlleth. This is not the case for for all the land currently defined as SSA D.
- The land within the current Area D is a more remote and wild area. It is therefore much more sensitive to development within it. The Mynyddy y Gwynt site has a history of development from lead mining to rallying—developing this site would therefore not violate a presently virgin, wilderness area.
- Most importantly, feasibility studies show that Mynyddy y Gwynt can deliver and make a significant contribution to the TAN 8 Targets for 2010. It is unlikely that any capacity to extend the grid to take power out of SS Area D would be available for at least seven years. Development within Area D is thus unlikely to make any contribution to the generation of renewable energy before 2013, three years after the target date set for TAN 8.
- It is a very sparsely populated area and development of this site would relieve pressure on other, more densely populated areas of Powys covered by Areas B and C.

5. POSSIBLE ALTERNATIVE SOLUTIONS WITHIN POWYS

As currently constituted, TAN 8 does not allow for the substitution of land between SSAs, even where development of an alternative area might have a lower environmental impact within the local authority jurisdiction.

If, as outlined above, the local authority Powys could amend Area D to include Mynyddy y Gwynt, it could, for example, also substitute this for a less appropriate, more sensitive site in Area C.

Area C, Newtown South, is a small area 5 km to the south of Newtown where development has to create the potential to add additional environmental impact on the settlements of Newtown, Llanidloes and Rhayader. Area C is identified as having the capacity of 70MW. Due to its proximity to Newtown, it is also however likely to exert a significant visual impact on Newtown, a major settlement in Powys.

The same capacity of up to 75MW could be accommodated within Mynyddy y Gwynt without causing the same degree of visual impact on important communities. This would allow Area C to remain unspoilt and undeveloped. Additional capacity could also be achieved without significantly adding to the visual impact by re-powering existing wind farms in the area using modern higher capacity turbines.

However, due to the drafting of TAN 8, Mynyddy y Gwynt cannot be considered as replacement capacity for Area C as local authorities only have the ability to refine an SSA, not substitute or exchange land within them.

6. CONCLUSION

The Mynyddy y Gwynt site is highly suitable for inclusion as a preferred site in the Strategic Site Area D. Its exclusion from TAN 8 was on the basis of an MOD objection that has since been resolved. It does not seem logical therefore to continue with a policy that seeks to exclude this area and instead develops land elsewhere that does not represent the best environmental impact option. It also means that the Government could miss an opportunity to meet a key objective of renewable energy generation from Wales by 2010.
In considering this matter, the developers of Mynydd y Gwynt are most grateful for the opportunity to bring this case to the attention of the Welsh Affairs Select Committee as part of their Inquiry into Energy in Wales. We would welcome a site visit by Members and meanwhile would be pleased to supply any further information, including copies of all technical, planning and environmental studies and plans that would help the Committee’s deliberations. We would also welcome an opportunity to give oral evidence and to bring forward expert wind energy and environmental witnesses engaged in the project.

December 2005

Written Evidence from CBI Cymru/Wales

CBI Wales is pleased to respond to the Welsh Affairs Committee Inquiry into Energy in Wales.

Energy supply is of critical importance to business in Wales, and the CBI is lobbying extensively on this issue at a Wales, UK and European level.

The key energy issues are security of supply, competitive costs as well as meeting the UK’s climate change commitments. Recent increases in energy costs in the UK have put significant pressure on business, especially manufacturers, at a time when other costs of production have also risen, giving rise to fears about the long-term viability of such companies in Wales.

A secure and competitive energy supply is of particular importance to the Welsh economy, given the over-representation of manufacturing and especially heavy manufacturing, in our economic mix, compared to the overall UK economy. High and unpredictable energy costs, and doubts about supply capacity will make re-investment in Wales less attractive for energy-intensive companies, many of which also have operations in other countries, putting the Welsh operation in competition with those.

The CBI has produced several papers on the issue of Energy Policy in the UK, all of which have been formulated after extensive consultation with our members, and we would like these to be considered by the Committee as part of their Inquiry. These include:


7 December 2005

Written Evidence from CBI Wales and Wales TUC

ELECTRICITY FOR WALES

INTRODUCTION

1. This is a joint paper presented by CBI Wales and the Wales TUC outlining our concerns about the long-term stability of electricity supply in Wales.

2. The CBI is the UK’s foremost business representative body dealing principally with cross-sectoral issues affecting the business environment in which all companies operate. The CBI’s objective is to create and sustain the conditions in which business in Wales can compete and prosper. The CBI’s strength lies in its breadth of membership, which includes all types of companies, from small to global, and covers all sectors of manufacturing, services and education. The CBI represents companies employing about 50% of the private sector workforce in Wales.

3. The Wales TUC is the voice of Wales at work. With over 50 affiliated trade unions representing around half a million members across Wales, we campaign for a fair deal at work and for social justice at home and abroad.

4. The supply of electricity in Wales is a crucial issue to Wales and to the Welsh Assembly Government if the aspiration set out in A Winning Wales is to be achieved. Of particular concern for business in Wales is having access to a stable supply of electricity at a price that enables businesses based in Wales to be competitive.

5. As most electricity in Wales is supplied via the National Grid, the electricity needs of Wales must be considered in the context of the supply and demand pattern in the UK as a whole.
**Forecast Demand and Supply**

6. The forecasts for electricity demand and supply in the UK until 2020, as quoted in the DTI/Ofgem JESS report, indicate that a much higher proportion of the UK’s electricity requirements will be produced from gas-fired power stations (65%) than is presently the case. This is due to the planned retirement of the older generation of nuclear power stations and the expected reduction in coal-fired capacity.

7. Approximately 41% of electricity generated in Wales comes from gas-fired stations. When Wylfa nuclear power station closes in 2010, and assuming the proposed gas-fired power stations at Milford Haven and Uskmouth come on stream in that time, that percentage will rise to approximately 50%. On present trends this dependence will continue to increase.

8. The closure of Wylfa will remove 8.6 TWh of capacity from Wales (28% of present Welsh generation) and will make North Wales a net importer of electricity. South Wales is presently a net importer of electricity and bears the highest electricity costs in the UK because of the high transmission costs.

**Risks to Supply**

9. There is a significant danger that in the short term there may be disruption to UK electricity supply in the winter months due to a lack of gas storage facilities in the UK. Although this situation is likely to change over the next few years as new gas storage facilities are built, it highlights the dependence of UK and Welsh industry on gas supplies to provide the electricity to keep the economy moving.

10. Given that a higher and higher proportion of gas used in the UK will be imported as North Sea reserves are progressively depleted consideration has to be given to the source of the gas and whether that supply is stable. Although gas will be piped from Norway in the near future, other supplies will come from Russia and, of particular interest to Wales, Qatar in the Persian Gulf.

11. It is easy to envisage a political climate where supplies of gas from Russia and the Middle East could be prevented from reaching the UK. If the UK depends upon gas for 65% of its electricity supply then it is clear that disruption to the supply of gas would have dire consequences to the economy and society of the UK and Wales.

12. Even if supplies themselves are not disrupted the threat of disruption can cause great volatility in the price of gas that has to be absorbed by industry. This volatility will greatly affect the ability of Welsh industry to remain competitive and would have serious consequences for the Welsh economy and society.

13. We are extremely concerned that unless key policy actions are taken now, then business and society as a whole will face an unacceptably high risk of significant disruption in the future. As the risks inherent in the forecast balance of supply are untenable we wish to see more electricity generated from non-gas fired power stations. If the UK and Wales is not to be too dependent on imported gas then more electricity must be generated from other sources.

**Possible Solutions—Fossil Fuels/Renewables**

14. Oil-fired power stations face many of the same issues as gas-fired power stations. The development of clean coal energy production is an important part of achieving a better balance of supply. However, the use of coal is limited by emission controls and climate change considerations unless significant investment is made into carbon abatement technologies.

15. Support for renewable energy is critically important in reducing reliance on gas-fired power stations. Wind power is already becoming an important contributor, however we believe it is important to accelerate the development of tidal and wave technologies so that they can start to provide a meaningful contribution to UK electricity supply within the next 10 years.

**Possible Solution—Nuclear Power**

16. Increasing electricity capacity using the above technologies is important, but it is unlikely that these technologies will reduce the dependence on gas sufficiently to bring the risk of disruption down to an acceptable level.

17. At present there is a planned reduction in nuclear generating capacity. We are not convinced that investment in renewable technologies will be sufficient to replace this loss in capacity. In our opinion the risks of over dependence on gas-fired power stations are so high that serious consideration must be given to investing in new nuclear generating capacity.

18. There are significant issues that need to be addressed if the establishment of new nuclear generating capacity is to be considered but we believe that if the economy and society of Wales is to prosper, the possible use of nuclear power has to be fully explored.
Role of the Welsh Assembly Government

19. The powers of the Assembly Government in this area are limited but we believe that there are several important steps that the Assembly Government must take in order to ensure that the policy it develops in this area is genuinely based on evidence.

20. These steps are:
   - The Welsh Assembly Government must make a clear statement that it is willing to consider the continuance of a nuclear generating capacity within Wales if that can be demonstrated to be the best option for the Welsh economy and Welsh society.
   - The Welsh Assembly Government must ensure that Welsh planning guidance does not arbitrarily preclude the development of nuclear power in Wales.
   - The Welsh Assembly Government must commission research to help determine the likely demand for electricity in Wales over the next 40 years.
   - The Welsh Assembly Government must not lobby the UK Government against the development of nuclear power.
   - The Welsh Assembly Government must accelerate its support for tidal renewable technologies and take a proactive stance in bringing the best of such technology to Wales.

Conclusion

21. If the Welsh Assembly Government is prepared to take a leadership role in having a full and rigorous debate on the electricity needs of Wales then the Wales TUC and the CBI will work with the Welsh Assembly Government to ensure that the people of Wales are fully informed about the issues at stake.

December 2005

Written Evidence from Councillor K J G Toy, The Conservative Group, Conwy County Borough Council

I have been asked by my Political Group Conwy County Council, to express to the Select Committee our views concerning the proposed erection of 200 Wind Power Turbines off the North Wales coast.

Your Committee should be aware that the coastline of North Wales is environmentally very sensitive, and our belief is that the addition of so many turbines would cause a very serious adverse visual impact, especially when added to the already visually intrusive existing Windfarm.

Equally importantly, our County has a low-waged economy, with most employment being in the public services or in the Tourist Industry, which latter is the mainstay of our local economy. We believe that destroying the visual amenity of the sea off our coast, especially off the coast of Llandudno and Colwyn Bay, will do lasting damage to the local economy.

3 December 2005

Written Evidence from John Hopkinson

1. What is the Government trying to achieve?

Under the Kyoto Protocol the EU agreed jointly to reduce carbon emissions to 8% below 1990 discharge levels, and this target should be met between 2008 and 2012. The UK government agreed to a 12.5% reduction and set a domestic goal of reducing carbon dioxide emissions by 20% of 1990 levels by 2010. (Ref “Planning for Renewable Energy” Ministerial Interim Planning Policy Statement 01/2005 Welsh Assembly Government July 2005.)

2. What did Privatisation of Electricity Promise?

The White Paper (“Privatising Electricity” February 1988 Cm 322) promised these specific benefits from privatisation (at page 16):

- securing a more efficient and economic supply of electricity maintaining the security and safety of electricity supply;
- meeting electricity demand at minimum cost;
and also stated that “Investment plans will be subject to commercial tests”.

3. What is proposed for "green" electricity?

An “important” component of the UK energy policy is to produce 10% of electricity production from renewable energy sources by 2010. (Ref “Energy White Paper: Our Energy Future—creating a low carbon economy.”)

Specifically for Wales, a target of 4 TWh (ie four million MWh) renewable electricity production by 2010 has been “established”. (Ref “Planning for Renewable Energy” Ministerial Interim Planning Policy Statement 01/2005 Welsh Assembly Government July 2005, paragraph 12.8.3.)

4. Is it sensible to concentrate on electrical energy production?

Electrical energy accounts for only 18% of UK energy consumption, and so 10% of 18% is less than 2%. (Ref Tables 1.1 to 1.3 in Aggregate Energy Balances 2003, Digest of UK Energy Statistics DTI 2004.)

Contrast this with the energy used to heat and provide hot water to homes (82% of domestic energy use) and industry (64% of industrial energy use). (Ref Mobbs, Paul “Energy Beyond Oil” p 3 Matador Publishing 2005.)

So it makes much more sense to address the heat supply needs to buildings by:

— Further insulation, particularly of older properties, and sealing of gaps which cause excessive ventilation.
— Increasing insulation requirements for new buildings, and extensions to existing buildings.
— Solar power for water heating.
— Ground source heat pumps for water and space heating.
— Biomass (or wood chip or wood pellet or wood) fuelled boilers.
— Replacement of old gas boilers with condensing boilers.
— Micro Combined Heat and Power (CHP) such as Powergen’s Whispergen.
— Micro electricity generation from micro hydro or domestic wind turbines.

All of the above should receive equal treatment from Government as regards publicity, promotion and financial support. Moreover, because they are all local to the point of use and do not suffer from the transmission losses inherent in national, regional and local electricity distribution systems, all of the above should be given a higher priority than larger-scale renewable electricity generation.

It is particularly disappointing that the Government is even now failing to address insulation properly (Ref letter from Andrew Warren, Director, Association for the Conservation of Energy to the “Independent” on 11 October 2005.)

5. What is wrong with wind power?

(a) Wind power is not an experimental or emerging technology, and should not require subsidy. All wind farm proposals must be demonstrably viable, without subsidy. (Ref Conwy and Denbighshire Supplementary Planning Guidance “Onshore Wind Farms” 2005 Appendix 2, Clause 13). The National Audit Office (March 2005) has already expressed concern at the excessive subsidy to wind power, as has the Select Committee on Public Accounts (Ref Sixth Report issued on 15 September 2005). If the “10% by 2010” target is reached for electricity generation by wind, the cost to consumers will be £1 billion annually in subsidies.

(b) Wind Power is variable, intermittent and unpredictable. (Ref Parliamentary Office of Science and Technology ‘Postnote’ Number 163, page 4). The wind blows when it will, the wind blows as strong as it will, the wind blows where it will. E.ON Netz GmbH have found that the power produced from a wide geographical spread of wind farms can drop by a factor of three in just 10 hours, and predict that no less than 48,000 MW of installed wind power plants would be needed to replace 2,000 MW of thermally generated power. (Ref E.ON annual press conference, Munich 16 June 2005). The cost in copper, steel, concrete and aluminium for 48,000 MW of plant is too great to bear contemplation.

(c) Significant costs are incurred in having plant underloaded or in spinning reserve on no load to meet shortfalls in predicted wind generation. Even with modern weather forecasting techniques, wind generation can fail to meet 60% of the power output predicted for it in the short term, and National Grid Control is obliged to “buy in” reserve. No generator voluntarily generates at less than full rated power for his plant.

Dinorwig pumped storage power station was conceived in 1972, and designed, built and commissioned in 1972, and designed, built and commissioned in the 70s and early 80s specifically to allow the National Grid to recover from the sudden loss of 1,320 MW of thermal plant. (Ref W Fairney et al “The CEGB Requirement for Dinorwig Power Station” I Mech E 1985 ISBN 0 85298 572X). Whilst Dinorwig can assist with grid frequency regulation whatever the cause of loss of generation, commercial break in popular TV
programme, unreliable wind generation it was designed when lots of surplus nuclear generation was expected to be available at night to enable economic pumping of the water back to the upper reservoir. This is not now the case.

(d) Unlike all other plant on the National Grid, wind generators do not have synchronous generators, and cannot pick up load by governor action to do their share of load pick-up if grid frequency starts to fall. Grid instability has been studied (Ref Anderson D and Leach M “Intermittency of Generation within Large Energy Systems” Imperial College 2001) with the tentative conclusion that the national network could cope with up to 10% (maximum) of electricity produced from wind.

(e) Noise. The sound from turbines is irritating, and is more irritating at lower wind speeds. (Ref Vestas V80–2.0 MW sales literature, ref 4596752575). Also, there can be an important change in wind profile, particularly at night when the atmosphere becomes more stable. The airflow around the blade changes, increasing turbulence. The effect is strongest when the blades pass the tower, causing short-lasting higher sound levels at the rate of the blade passing frequency ie “thumping” (Ref “Noise Management” Journal November 2004, page 6).

(f) Reduction in CO₂ in the atmosphere. Wind turbines do not lead to any reduction in CO₂ in the atmosphere. (Ref Evidence presented at the Carmarthenshire County Council Departures Committee on 24 November 2005, when the Blaengwen Wind Farm Application was refused.)

There are also issues such as bird strikes, threat to peatland habitats, and threats to underground water systems and water supplies which I will leave to others more qualified than I in these areas to comment on.

6. **Distribution System in Rural Areas**

In very few cases will the existing electricity supply infrastructure be capable of accepting significant new load as generated by a wind farm when the wind is blowing strongly. The alternatives available are to lay in extra overhead lines (underground cables will almost always be prohibitively expensive) or to restrict the output of the wind farm to what the existing lines can accept whilst remaining within the constraints of current-carrying capacity for the lines.

7. **The contribution of existing hydro stations**

In Wales there is already a very significant amount of hydro power, for example at Rheidol, Maentwrog, Dolgarrog and Cwm Dyli. There are many smaller schemes now generating, and other schemes potentially viable. It seems arbitrary to “penalise” hydro of 20 MW and above by not treating them as renewables, which they patently are. Furthermore, trees are already being felled to help wind turbines achieve their potential, and yet the felling of trees to enable Rheidol to generate 13% more energy (by diminishing the amount of transpiration of rainfall back into the atmosphere) has not been allowed.

All hydro currently generating in Wales should count towards the 4TWh “target”.

30 November 2005

**Written Evidence from Conwy Locals Opposing Unnecessary Turbines (CLOUT)**

We would like to take this opportunity to comment on the current and future portfolio of energy provision in Wales as it relates to wind farms.

Over the past four years the rapid expansion of speculative wind farm development within our area has been a cause of great concern and upset to many local residents. Indeed, our group was set up specifically to deal with wind farm applications within the county of Conwy. It consists entirely of local residents: busy, working people, who, with their own time and money, have fought vigorously to protect the environment in which they live. As such, we have had much experience at a local level on the issues surrounding wind farm development.

In general terms, we would like to raise the following as points for discussion in relation to the Welsh Assembly Government’s policy on wind power, with particular reference to Technical Advice Note 8:

- TAN 8 is too heavily biased in favour of wind farm development to the detriment of other less environmentally-damaging technologies.
- The inefficiency of wind turbines and the need for back-up power generation has not been adequately examined. The unpredictability of wind power results in little or no reduction in CO₂ emissions and thus it is not clean energy in any true sense of the word. Indeed, CO₂ emissions continue to rise each year and, to our knowledge, no power stations have been stopped or turned down because of energy substituted from wind turbines.
- Too little emphasis is placed on energy conservation and energy saving measures.
- In TAN 8 no account is taken of the impact of wind farm developments on tourism.
— No mention is made of the indirect subsidy received by the wind farm developers from Renewable Obligation Certificates and the cost which will ultimately be borne by consumers.

— TAN 8 proposes using heavily-forested areas which will ultimately mean the removal of trees which provide valuable CO₂ sinks. Similarly, peat reserves play a valuable role in carbon sequestration but these areas will also be badly damaged by turbine bases.

— No mention is made of the potential for flash flooding on lower valley areas as a direct consequence of soil/peat displacement from wind turbine bases and associated tracks.

— No mention is made of the potential for flash flooding on lower valley areas as a direct consequence of soil/peat displacement from wind turbine bases and associated tracks.

— Environmental Impact Assessments are invariably written by wind-energy consultants and are thus biased in favour of wind power schemes. The visual impact of proposed developments and the effects on wildlife and local ecology are routinely played down. Energy outputs are exaggerated and incorrect efficiency factors are frequently used. Similarly, the Welsh Assembly Government did not seek impartial advice in the writing of TAN 8 but relied almost entirely on wind-energy consultants for its information.

— No mention is made, or the issue explored, of the possible harmful effects of low frequency noise and the impact on human health.

— No mention is made of the detrimental effect of wind farm developments on property prices.

— TAN 8 places undue pressure on regional Planning Officers i.e. counties must produce their quota of so-called renewable energy, whatever the circumstances. Seemingly, no mitigating planning policies will be taken into account and Planning Officers are using TAN 8 as a justification for granting approval of often controversial planning applications.

— Assuming the off-shore development at Gwynt-y-Mor is granted consent, we have not been given a clear answer as to whether the output total will be awarded to England or Wales.

— We would like to know why the DTI and the WDA have consistently blocked tidal energy as a viable and more cost-effective alternative to wind power. Though we were told by Tidal Electric that the Swansea Lagoon could be generating before 2010, this was refuted by Welsh Assembly Ministers. We now learn that the project has been allowed to proceed beyond the consents stage and could be generating before 2010. Such misinformation on the part of the DTI and WDA has seriously skewed opinion and the market in favour of wind farms.

28 November 2005

Written Evidence from T J Priestman

PROPOSED GYWNT Y MOR WIND FARM

I write in order to register my strongest possible objection to this proposed development off the North Wales coast.

Whilst I am all in favour of realistic and meaningful efforts to reduce CO₂ emissions and thereby hopefully have some effect on global warming, this proposal to site 200 + turbines just off the coast near to the splendid Victorian town of Llandudno is totally ill-conceived. If built, the project would blight the seaward view of a whole stretch of the North Wales coastline whilst having, at best, a singularly insignificant effect on the CO₂ emissions of the UK. The government’s 2010 target for the reduction of CO₂ emissions amounts to just four ten thousandths of the world total CO₂ emissions. Gwynt y Mor would contribute only a small part of this figure. Even if we were to achieve the total target, we would have only an insignificant effect on CO₂ production and would most certainly have no influence whatsoever on climate warming or the prevention of a rise in sea level. As a business proposal in the private sector, this wind farm suggestion would be dismissed out of hand.

I believe that the proposers of this scheme, together with the government, are attempting to hoodwink the general public into believing that windfarms are the only way in which CO₂ emissions could be affected. This is patently not the case. Such a massive investment for such minimal return would not, in normal circumstances, have any attraction for any developer. It is only because of the massive monetary incentives being offered, that the developer of Gwynt y Mor is proceeding. This whole situation with wind farms is symptomatic of the complete muddle that the government is in with regard to the provision of electric power in this country.
Mr Blair stated at the time of the proposal to build just four, relatively small wind turbines near to his constituency home in County Durham, that “large turbines should not be sited near to housing developments”. How many housing developments would be affected by Gwynt y Mor?

Llandudno, Rhos-on-Sea, Colwyn Bay, Penrhyn Bay, etc etc would be blighted by this development which would stretch some 15 miles up the coast. For the developer to claim that 200 turbines, each over 500 feet high and higher than Blackpool Tower, would not have a massive and totally detrimental effect on the seaward view from all these towns is at best laughable and at worst an insult to our intelligence. But of course, Mr Blair does not live in North Wales.

I have yet to see any proper justification for this proposal and I urge you to scrap it completely before lasting, irrettrievable harm is done to this beautiful coastline in return for what could only amount to a miniscule effect on the CO2 emissions of this country and the climatic problems of the world.

29 December 2005

Written Evidence from Russ Sheaf

Objection to Rhyl Flats and Gwynt y Mor Windfarms

You know the issues here undoubtedly but I would be failing myself and the people of Llandudno if I didn’t register my objection to this industrial development on the grounds that it will have serious ramifications for the future tourist trade in the area. The area around Llandudno is North Wales’s key tourism location. More than one-fifth of all the tourism revenue in North Wales is spent there.

Three important points are: N Power’s figures on visual impact and effects on tourism? Their research is, I believe, questionable. My own face to face market research with many hundreds of tourists (spent over many hours in the summer on the prom no less) shows a rejection of the development to the order of over 90%. In addition The visual impact photographs of the giant turbines seem to have been taken with a wide angle lens rather than the eye equivalent of 50mm and are clearly misleading. Lastly there is a growing spread of alarm at the possibility that if a natural flood defence barrier is disrupted there could be catastrophic flooding in an area that in the past has had major flooding issues.

May I also ask what other possible economic benefit it can bring to the area-surely not just the 120 promised “local” jobs? Compare that please to the loss of employment in the tourism industry.

If N.Power has its application accepted the premier Welsh resort of Llandudno will be desecrated by the erection, just off the bay, of over 200 windmills, each higher than Blackpool tower. This wonderfully preserved Victorian town will be industrialised.

16 December 2005

Written Evidence from John G Phillips

I am naturally concerned about the visual impact of the above which will be in front of my house like a concrete fence across the bay from Rhyl to Llandudno. I am also concerned that the huge sums of money could be better spent on research into safer nuclear power stations which, judging from recent press releases, appear to be inevitable if we are not to be held to ransom by other countries in the near future.

It would seem churlish to object to the wind turbines if they were to be installed all round the coast of Britain, including such places as Eastbourne and Bournemouth, and by so doing that the power stations could be permanently switched off, but is this likely?

As I understand it, on a global scale these turbines produce little and irregular amounts of electricity and will be quickly negated by a couple of extra jet planes or a few hundred motor vehicles. Will the USA, China, India, Russia and Japan stop making cars and planes? Will they follow us and invest in thousands of wind turbines? I believe that they will “go nuclear” and it is essential that we are involved in order that we can ensure that no inferior quality power stations like Chernobyl are ever allowed to be built again or that irresponsible methods of waste disposal be employed by rogue nations. Britain should lead.

12 December 2005
Written Evidence from The Environment Trust

EXECUTIVE SUMMARY

The Environment Trust is working to bring the UK’s first community owned tidal lagoon to Swansea Bay. Tidal lagoons use an offshore impoundment structure that looks like a rocky island. The impoundment is fitted with conventional low-head hydroelectric generating equipment and produces predictable power. The technology works best in areas with high tidal ranges, and Wales has the second highest tidal range in the world. Wales has the potential to lead the world in tidal energy.

We hope to develop schemes in Newport and Rhyl after Swansea. There are 22 sites across the UK where this technology could be applied, and we believe that it could eventually supply up to 20% of the UK’s energy needs.

1. INTRODUCTION

1.1 About the Environment Trust

The Environment Trust is a registered charity and a company limited by guarantee. We improve the social, economic and physical environment for community benefit. We were established in 1979, and have built an award winning millennium park in Mile End, a number of affordable “green homes” in London and now in Sheffield, and improved numerous green spaces in London. We also run environmental education programmes and established Fair Finance, the UK’s first Financial Services Authority accredited community finance institution.

1.2 The Environment Trust’s interest in Welsh Energy

The Environment Trust has recently acquired the Welsh Biofuels wood pellet factory in Bridgend. We turned around its business plan and the business is now processing 10,000 tonnes of wood pellet a year. The business has expanded from six to 16 employees, is controlled by a majority Welsh board, including Win Griffiths, the ex-MP for Bridgend, and is committed to using its profit for community benefit in Wales. We are hoping to establish other factories in the UK using the Welsh Biofuels brand.

1.3 The Environment Trust is working to install a tidal lagoon in Swansea Bay. This tidal lagoon, and the position and potential of tidal energy in Wales more generally, will be the main focus of this written evidence.

1.4 The Trust welcomes this opportunity to give evidence to the committee, and will be pleased to appear as a witness, or to offer further information if necessary.

2. TIDAL LAGOONS—GENERAL PRINCIPLES

2.1 Until now, the main way of generating energy from the sea has been tidal barrages, notably La Rance Barrage in France. Environmental problems have made tidal barrage technology unattractive because navigation is blocked, fish migration is impeded, shoreline habitats altered and the tidal regime is changed.

2.2 Offshore tidal lagoon technology is a new way of generating electricity from the ocean. The technology is similar to conventional low-head hydroelectric technology, but by using tidal pools built from loose rock and located offshore, potential environmental damage is eliminated.

2.3 Electricity is generated as the tidal lagoon fills and empties on the ebb and flow of the tide. The hydroelectric generating equipment is housed in a self-contained offshore impoundment structure or atoll built from loose rock. Using this offshore impoundment structure, water is impounded at high tide and delivered to turbines at low tide, and then the water is held out at low tide and delivered through the turbines at high tide.

2.4 This diagram illustrates the power generation cycle of a tidal lagoon. At high tide the lagoon appears as a circle on the surface of the water, almost invisible from the shore. At low tide, it looks like a rocky island. As the structure is built from locally sourced rock, it can provide a vital habitat for wildlife. It can be located as little as a mile offshore, so it has no effect on shipping or navigation.
3. A Tidal Lagoon in Swansea Bay

3.1 The Environment Trust is working to create the UK’s first tidal lagoon in Swansea Bay, with a declared net capacity (DNC) of 60MW. This would provide the whole of Swansea with electricity.

3.2 This plant would save up to 194,332 tonnes of carbon emissions per year, which over the 50 year life of the plant amounts to 3,886,641 tonnes of carbon saved. Tidal lagoons could therefore play a vital part in allowing the UK to meet its carbon emissions targets.

3.3 Subject to ERDF and Welsh Assembly support, the Environment Trust would make the lagoon in Swansea Bay community owned—the first community owned power plant in Britain. This would ensure that the profits from the sale of the electricity (estimated to be £8 million a year after the first three years).

3.4 Because tides are totally predictable the output from a tidal lagoon can be estimated very accurately. The projected cost of electricity is likely to be 3.5p per KWh. For larger project in locations with higher tidal ranges, cost could be as low as 2p per KWh.

3.5 Developing the Swansea Bay scheme will take three years, including the community consultation and consents process. Private loan finance for half the cost has been offered but, because this is the first scheme, private equity investment is proving difficult. Paradoxically, this offers a unique opportunity to translate government grant into community equity and provide a revenue stream to pay for community led regeneration into the future.

3.6 In response to earlier concerns by Welsh Development Agency and Department of Trade and Industry officials, a detailed study by WS Atkins was commissioned. The Executive Summary is attached as an annex, but the main findings are as follows:

3.7 Feasibility confirmed

Atkins investigated the feasibility of construction, operation and eventual decommissioning of a tidal lagoon installation, with proposed capacity of 60 MW and annual generation of 187,000MWh. The installation concept envisaged an impounded area of some five kilometres square, in a water depth of 1—5 metres at mean low tide, with 24 bi-directional turbines each of 2.5MW capacity.

3.9 The Atkins study has confirmed both the technical feasibility of the project and its ability to deliver the specified output, on a predictable basis with minimal regular maintenance and negligible operating costs. It further confirms that practical design solutions exist for all necessary structures and equipment. Working with the local utility, Western Power Distribution, a way has been found of connecting to the grid.
3.10 No exceptional problems

Atkins engineers studied the full range of exceptional issues related to the location, such as tide and weather conditions, likely settlement of structures on the seabed, disturbance of seawater circulation in Swansea Bay and possible ship navigational hazards. It was concluded that there were no inherent exceptional problems.

3.11 The study finds that it should be possible to obtain all the plant, equipment and building materials and complete construction of the facility within 36 months. Looking well ahead, de-commissioning issues relating to the proposed installation were reviewed and found to present no particular technical problems.

3.12 Costs

Indicative costs were drawn up, based on investigations with various suppliers and contractors. If given the go-ahead, the next phase would be to put a specific design out to competitive tender, which would allow for more accurate capital cost estimates.

Based on the Atkins findings, it is possible to produce electricity from the Swansea Bay scheme at a cost of 3.5 pence per kilowatt hour.

3.13 River Tawe Test Project

Despite the conventional hydroelectric technology used to generate electricity in a tidal lagoon, there has been some debate over the use of hydroelectric generators in this context. In response to this, the Environment Trust is working with the City and County of Swansea to bring back into use the currently unused turbine in the River Tawe. This would both be a valuable renewable energy scheme in its own right and a scaled down demonstration of how a larger lagoon would work.

4. The Wider Context

4.1 Wind energy dominates the renewable energy policy landscape in Wales, and lack of government support for or interest in tidal lagoons has made it difficult to secure financial backing for the pilot scheme in Swansea. The Crown Estate, who lease the land necessary to build the scheme is Swansea Bay, are adamant that they cannot proceed without a strategic lead from the DTI, in the form of the Offshore Renewables Strategy.

4.2 The Offshore Renewables Strategy went for public consultation in 2002, but has not yet been published. The consultation document dealt solely with offshore wind power, and we are concerned that the potential of tidal power is being ignored. However, we do have a note of a meeting with DTI officials where they indicated they would look on tidal lagoon technology favourably.

4.3 Tidal lagoon technology was dealt with favourably in the 2004 House of Lords Science and Technology Committee report, Renewable Energy: Practicalities. Both AEA Technology and Friends of the Earth have also backed the tidal lagoon scheme, with AEA Technology concluding that tidal lagoon technology is “mechanically feasible, environmentally benign and economically profitable.”

4.4 Once the Swansea Bay scheme is established, we would like to develop further lagoons in Newport and Rhyl. There are 22 further sites around the UK with tidal ranges high enough to support tidal lagoons—we believe that there is the potential to supply up to 20% of the UK’s electricity needs from tidal lagoon technology.

December 2005

Written Evidence from Mr Lyn James Jenkins, Director of Ceredigion Leisure Ltd

My name is Mr Lyn James Jenkins, Director of Ceredigion Leisure Ltd, a tourism company based in Gwbert, Cardigan, Ceredigion. We own a tourist attraction called “Cardigan Island Coastal Farm Park” at Gwbert, Cardigan [see cardiganisland.com]. Therefore, I am very concerned about the effect that gigantic wind turbines will have on the tourism industry in Wales. As you know, the Wales Tourist Board state that tourism is worth a phenomenal £2.5 billion pounds a year to the Welsh economy! It is far and away the most important rural industry, especially since agriculture is being devastated by unfair supermarket pressure. Thousands of farmers, like ourselves, have diversified into tourism. Many farmers have caravan sites; farm bed and breakfast businesses; farm cottages; attractions etc etc. They rely on the tourist enterprises to supplement farm income.

We all know that visitors come to Wales for the glorious green scenery. The verdant patch-work of neat green fields topped by rounded hills and bare moorlands, where walkers can unwind by escaping their crowded cities, are our greatest assets! They are the crown jewels of Wales!!! It is sheer lunacy to destroy this magnificent scenery by erecting hundreds of 400 feet high wind turbines on totally unspoilt hills. The hundreds of turbines we have already, especially in Mid Wales, are bad enough, but the latest models are treble the height and treble the width of those machines. Without a doubt, perched up on our hills, they will be visible on a clear day from a fifty mile radius. Do you realise what this will do to Wales? It is only a small country of 8,015 square miles. It is only 38 miles from Aberystwyth on the west coast to England in the east!!
These whirling metal monsters on our hills will be clearly visible from our National Parks, as well as from places of scenic beauty throughout Wales. The Cambrian Mountains are not in a national park, but they are bigger, wilder and more awe-inspiring than some of England’s National Parks. They make Exmoor look like a back garden! They are more attractive than Dartmoor National Park, as well. Look how popular the latter is with tourists!! It is down to marketing. The Cambrian Mountains of mid Wales could attract hundreds of millions of pounds of extra revenue to Wales if they were designated as a National Park and marketed properly. Instead, the A44, which links Aberystwyth to Welshpool is becoming festooned on either side by ugly wind turbines which look totally out of place in such dramatic NATURAL surroundings. George Borrow who wrote the classic book “Wild Wales”, on his travels to these parts, must be spinning in his grave faster than any wind turbine!! The whole wild essence of Mid Wales is being destroyed!

The influential Times columnist, Sir Simon Jenkins, who is a very keen hill-walker, likened the view from Pumlumon to that of a “Kuwaiti oil-field” in a report in The Times a few years back. That was when about 250 wind turbines 150 feet high were visible from there. Since then, the 39 gigantic 327 ft high wind turbines of Cefn Croes have been erected four miles to the south of Pumlumon. I dread to think what Sir Simon Jenkins thinks now. His reports are read by many of the wealthiest potential tourists and investors in the UK. Think of the financial damage he is causing when he speaks the TRUTH about the ruined scenery of Mid-Wales!! He is driving away millions of pounds!!

Yet what has been enacted so far is nothing compared to the absolute devastation that will be unleashed by the enactment of WAG’s TAN 8 proposals. There will be 100 MW of wind energy on the western flank of Pumlumon from Machynlleth to the A44, around Nant-y-Moch Reservoir. That is 50 monstrous 400 ft high turbines, almost half the height of the Eiffel Tower with blades much longer than Nelson’s Column. Then there will be a far vaster wind farm along the unspoilt spine of Wales, running south from glorious Llyn Efyrnwy [Lake Vyrnwy] to Carno.

What have they got planned in that superb scenery? About 250 MW? That is a further 125 monster turbines, plain as daylight from Snowdonia National Park, especially from majestic Cader Idris. It is a heinous crime against Wales to even contemplate such desecration!! It will wreck North Wales tourism even in the National Park areas. The turbines will almost be as tall as Blackpool Tower! Unthinkable!!

As if that is not a big enough knife stuck into the heart of Cymru Fach . . . . . or should I say into the middle of its unprotected back?! . . . there is a further 100 MW, 50 more 400ft wind monsters, planned for lovely Powys, south of Newtown! What will that do for the tourist economy of Llandrindod Wells and the lovely Elan Valley?

The Automobile Association voted the drive from Presteigne to Aberystwyth along the A44 as one of the finest in the world a few years ago? Who in their right minds would turn that glorious natural experience into a drive through a corridor of steel? Only the greatest enemies of Wales, I would surmise!! It could be said that a literal iron curtain is being stretched across the slim midrib of Wales, from Aberystwyth to Shropshire! What a welcome in the hill-sides for the hundreds of thousands of tourists that drive down from the Midlands and North West of England! It will be enough to make many of them turn around and head back for home, taking their much-needed revenue with them. They certainly will not return a second time once they witness the devastation and despoiled hills!! Again, the Brechfa Forest of Carmarthenshire is to have 50 gigantic wind turbines. This is the home of the RAC Motor Rally televised and broadcast worldwide. Welsh tourism to the “Garden of Wales” will be brutally battered by TV pictures of whirling steel monsters, where once there were trees!!

Yet, what will TAN 8 achieve? It is meant to deliver 800MW of installed electrical capacity. Yet OFGEM records prove that the existing Mid Wales wind farms at Carno and Llandinam only average 22% of their installed capacity per annum. When they were proposed, 30 to 35% was promised!! Cefn Croes, with an installed capacity of 58.5MW, was also claimed to deliver 30–35%. Well, it’s early days yet, but in six months of 2005, Cefn Croes averaged a mere 23.5% of installed capacity. In fact, in August 2005, it managed a pathetic 13.5%!! Electricity is needed around the clock, not now and again, so what good is that?

If Cefn Croes averages 23% annum, it will be generating a mere 13.45MW sporadically, backed up by burning fossil fuels most of the time. The CLAIM that Cefn Croes supplies 45,000 homes with regular electricity is a complete fabrication! Even if one accepts the official DTI national average for domestic electricity usage of 4,700kwhrs per annum . . . . . which does NOT include home heating, [5 x 100 watt bulbs x 24 hours x 365 days = 4,380 kwhrs or units!! What about TVs and computers on standby; TV usage; fridges; electric kettles and fires; immersion heaters; toasters; washing machines; spin dryers; electric cookers; microwaves; vacuum cleaners; second and third TVs in children’s rooms; computer games; telephones; dish-washers etc etc? Don’t THEY all use electricity?] The 4,700kwhr per annum “average” home is clearly not the NORMAL electricity dependent house. Just check your own electricity bills in rural WALES, not in gas-heated urban London!

However, even if one accepts 4,700 units, then, one finds: 13,450 KW x 24 hrs x 365 days divided by 4,700 units per home, the answer is 25,068 homes NOT 45,000!! Furthermore, even THEY will not be supplied by Cefn Croes, because the wind does not blow all the time. The trifling wind energy output will be fed into the National Grid. The National Grid powered by fossil fuels and nuclear will supply those 25,068 homes 24/7 in truth!!
Again, if TAN 8 generates 23% of its proposed 800MW installed capacity, it will generate an intermittent 184MW ONLY!! But Wales will be wrecked, scenically, by seven turbine zones from Clwyd to the Glamorgan Valleys. And what for? At about the same time, it was announced that there would be a new 800MW gas-fired power station at Uskmouth and another large 2,000MW gas-fired power station at Milford Haven!!

Wales already generates well over 4,000MW, without including our large pumped storage facilities at Dinorwig and Ffestiniog, and without counting the piffling, sporadic output of our 400 wind turbines. Yet we only utilise around 2000MW in Wales. Over half of current production goes to England. The new power station at Milford Haven alone would meet Wales’s demands!! Yet, whilst politicians make a huge fuss about CO2 production, massive new CO2-producing gas-fired stations are announced without a murmur . . . at the same time!! The hypocrisy is incredible!!

There was a great fan-fare for Cefn Croes . . . for what? A measly 13.45 Megawatts!! Pathetic!! What press coverage has the proposed 2,000MW gas-fired power station for Milford Haven received? Very little!!

Furthermore, a perusal of official Met Office wind speed statistics on www.metoffice.com/education/archive/uk proves how often the wind drops below nine knots in Wales. Wind turbines generate nothing below nine knots!! They grind to a halt.

In April 2004, at Aberporth Met Office, Ceredigion, a very exposed site, the wind dropped to nine knots or below on 22 days out of 30. In May 2004, it was 25 days out of 31. It was the same all summer. The wind dropped frequently, especially in morning and evening. There was another long calm spell in October/November 2004 under an anti-cyclonic High pressure area.

Similarly Christmas Day 2005 was very calm!! It would have been raw turkey all round if we’d relied on the wind for our electricity!! Then on 28 December, the UK suffered its coldest day for decades, with minus 10 degrees Centigrade being recorded in several locations. There were several inches of snow lying on the ground throughout eastern England. Yet at 6 pm, the hour of peak daily demand, [see www.bmreports.com], wind statistics on www.metoffice.com, prove that only one Met Office, out of more than 70 on mainland UK, recorded a wind speed in excess of nine knots . . . and that was a light 11 knots at Weybourne!!

Furthermore, Since 3 January 2006, I have again started monitoring wind speeds on www.metoffice.com/education/archive/uk at all six Welsh Met Offices, the length and breadth of Wales. They are Valley, Anglesey; Lake Vyrnwy in the north Powys hills; Trawscoed, Aberystwyth; Aberporth, Ceredigion coast; Sennybridge, Brecon and St Athan on the Glamorgan coast.

I chose readings an arbitrary 8 am and 8 pm, every day, from 3 January 2006 to 4 February 2006. This is in the depth of winter, with freezing temperatures being recorded often. Therefore, the demand for electricity was at record levels over much of this period.

It was found that a wind speed of nine knots or below were recorded for 67% of all the readings, on average. In fact, Lake Vyrnwy Met Office, close to the largest TAN 8 zone in Wales, records a wind speed of nine knots or less on a whopping 84% of occasions!! That is only through taking readings at 8 am and 8 pm. If one took additional readings an hour or two either side of these times, on the windier days, the percentage of low readings is certain to increase.

Therefore, how could any back-up fossil fuel or nuclear power stations ever be run on reduced output, let alone ever be switched off . . . even if there were a TRILLION wind turbines in the UK!!!!?? Wind turbines are worth nothing without sufficient wind!!

Clearly, no conventional power stations can EVER be closed, and replaced by wind turbines. Under a large anti-cyclone, as at present, there is no wind anywhere in the UK to speak of. The optimum wind speed for most wind turbines is around 30 knots. How often does such a wind speed last? No more than for a few hours every now and again. How can one run a country on energy available “now and again”?!! May I suggest that your committee obtains wind speed records for Wales from the Met Office, similar to those displayed on www.metoffice.com/education/archive/uk and puts them into graph form to prove my point about inadequate wind speeds? You would need stats for all six Welsh recording centres.

If anyone cares to peruse the aforementioned NETA web-site, www.bmreports.com, and check bmreporting, then click “Initial Demand Out-turn”, under National Data, one will see that on 29 November 2005, at 5.30 pm, a new record was set for UK electricity usage. The UK used 59.477MW for the first time ever, according to the bmreports.com records. The previous record, before that cold week, was 54.431MW on 10 December 2002. We are breaking that record hour after hour at present, especially around 5.30 pm on a week-day, when millions arrive home from work and switch on their 3kw electric kettles!! Therefore, peak electricity usage in the UK has risen 5,000MW or 10% in three years. Meanwhile, three years prior to that, the Government stated that 10% would be generated by renewables by 2010, so it embarked on a policy of ever more wind turbines.

Now, after erecting about 1,400 wind turbines in some of our most attractive UK hill locations, we manage to obtain around a 220 MW total, sporadically, on average!! This is often at night, when we don’t need it!! And of course, almost always backed-up by fossil fuels, anyway!! It is farcical!! We are chasing our tails with no hope of getting even close! We are desecrating our finest hill scenery and wrecking our most valuable rural industry for next to NOTHING in return!!
I encourage you to be totally HONEST and to face up to the fact that wind energy does not have a hope of meeting even a fraction of the UK’s electricity demands. TAN 8 should be scrapped before it does irreparable damage to the beauty of Wales!

Mid Wales is being sacrificed to supply the West Midlands of England with a trivial amount of intermittent electricity. Where are the wind turbines of Shropshire, Staffordshire, Warwickshire, Worcestershire etc etc? There are NONE!! Yet these counties have far higher populations than Mid Wales and therefore need far more electricity! Is it because too many dissenting English voices would oust Labour from some of their marginal seats?

The Labour Government is now talking of building new nuclear power plants. In which case, what earthly point is there for gigantic wind turbines generating trivial sporadic amounts of electricity? By the way, Wales does not need any new nuclear power, because we already generate well over twice our needs, with two more huge new gas-fired power stations on the way.

Unlike England, Wales is over-flowing with electricity!! Finally, it has been reported in the South Wales media that the Swansea area is being hard done by through having 40% of TAN 8 inflicted upon it. The statistic is untrue! Mid Wales, around North Ceredigion and Powys is bearing the brunt of TAN 8, even though it has a low population.

Huge numbers of 400 ft high wind turbines are being inflicted upon it to serve the TURBINE-FREE West Midlands, not Mid Wales! A new pylon line will further despoil the area to carry the sporadic, trifling power to England. That cannot be fair and just!! Welsh politicians should be working for the WELSH economy, not England’s. I will remind you that over 250 wind turbines were visible from glorious Pumlumon Fawr before embarking on TAN 8, so Swansea need not say it is being targetted more than Mid Wales. If wind turbines are not right for the Swansea area of South Wales . . . . . . they are certainly not right for Ceredigion, Powys, Clwyd and Carmarthenshire!! Let’s hope that Labour favouritism, or even NIMBYISM, is not allowed to enter the argument!! Play FAIR with North, Mid and West Wales!

Have the courage to scrap ALL the wind energy proposals of TAN 8!! They have NO HOPE of delivering Wales’s future electricity needs! Future generations will KNOW it is the right decision for Cymru Fach!! They will be eternally grateful to you if elect to reject this completely inadequate document, which will totally desecrate the beauty of Wales without achieving anything positive for our beautiful country.

6 February 2006

**Written Evidence from Jonathan Lincoln, Sustainable Energy Alliance (SEA)**

I am writing as the co-ordinator for the environmental campaign group Sustainable Energy Alliance (SEA) to ask for your support for the proposed Gwynt-Y-Mor offshore wind farm.

Gwynt-Y-Mor, if built will number some 200 turbines and will be sited nine miles off the coast of Llandudno, it will have a generating capacity of up to 750 MW, enough to meet the demands each year of 500,000 homes (or 41% of houses in Wales).

It is agreed that climate change is a serious and global threat, if we are to address this very real problem then we need to move away from dirty polluting fossil fuels and nuclear power with its inherent risks and huge financial cost, we must instead as a priority, invest in clean green renewable technologies such as wind, solar and wave energy.

Offshore wind provides a clear opportunity to produce clean and sustainable energy and it works! Britain has the best wind resource in Europe and the potential to develop a world class offshore wind industry. The building of this wind farm provides a great opportunity for Wales and would show the rest of the UK and the world that this country takes its responsibilities and commitment to the Kyoto protocol very seriously.

**Written Evidence from the Glyncorrwg Action Group**

Following a meeting with Hywel Francis, MP Chair of the Committee he agreed that I could make a submission to the committee on behalf of the Glyncorrwg Action Group, they have agreed to my making this submission on their behalf. This group was established to fight against wind farms in this area, the first campaign was in 1994, I was involved in that fight. All my remarks are about wind energy in Wales.

Before anyone accuses us of NIMBYISM, we have a wind farm in our backyard. This is the Fynnon Oer wind farm comprising 16 × 300 ft turbines which has been dumped on an upland area near to one of the most disadvantaged areas in the UK. The Cymmer ward is eighth in the Multiple Deprivation index of 865 wards for Wales; it also has the highest levels of ill health in England and Wales. Wind farm developers seem to plan their projects where they think there will be the least resistance.
We are not opposed to renewable energy and not opposed to wind farms if they are acceptable to the local community. What we are opposed to is where big business forces a wind farm on a community.

I would like to bring to the committee’s attention the following:

1. The Wider Context
2. TAN 8
3. How It Affects Wales
4. Glyncorrwg/ECO2 Application
5. Recommendations

1. THE WIDER CONTEXT

— The USA has 5% of the world’s population but consumes 25% of the world’s energy.
— I believe the UK will be one of the few countries in Europe to comply with the Kyoto agreement by 2010. Why are we rushing to fulfil our obligations when others do not see it as a priority?
— Within the UK Wales has 5% of the population but has 19% of the wind farms and generates 23% of the total amount of wind energy for the UK.
— Within Wales the area in which I live is expected to generate over 30% of the total energy from wind farms.
— In global terms all the efforts to combat global warming will be negated by the high consumption of energy in the USA.

2. TAN 8

The consultation process on the TAN 8 proposals was a sham. Glyncorrwg is in one of the areas thought by the Welsh Assembly to be suitable for wind farms to be sited. There was no consultation with individuals or the community about the designation of this site. I am not sure how much consultation was held with local councils.

One gained the impression that it was being bulldozed through. I sent a letter to the Welsh Assembly on 22.9.04 saying, “This is not my letter of objection but I am writing to complain about the consultation process and to ask a number of questions to obtain information, which will help me in writing my letter of objection”. I was sent a reply thanking me for my letter of objection! The area in which I live was referred to as Glyncorrwg, Neath when Neath is 10 miles away. This shows this plan was clearly drawn up by people who regarded Glyncorrwg as a dot on the map and had no idea of the location of the village.

This was a textbook case study in how a consultation should not be handled and I am sure it will be used in Planning Schools in the future.

1. The consultation process was announced on 13 July just as the school holidays were starting and many families were obviously more concerned about their annual holidays. This was a cynical attempt to slip this announcement through when people’s attention was distracted. This further undermined people’s confidence in the planning process.

2. I live in an area, which is directly affected by these proposals, but I only found out about it in a small article in a local newspaper. Most people in this community do not know about TAN 8 or its far-reaching implications for this area. Why were there no public meetings on this issue in the areas most affected?

3. The time period was too limited, and spanned a time when many people were on holiday and many organisations do not meet. More time was required and a letter should have been sent to each household.

The time period was extended but there was not sufficient time for many people to respond.

TAN 8 gives advantage in planning terms to developers over local communities which is against the laws of natural justice. Local people should be able to determine their own destiny and not be overruled by outside bodies. It is undemocratic and unfair. The proposals will have a huge impact on this area and residents should have been better informed on what these proposals entail.

3. HOW IT WILL AFFECT WALES

The developments of large-scale wind farms will ruin many parts of the Welsh landscape and will seriously affect plans to attract more tourists. It would be better to invest resources in energy efficiency and in energy conservation. The uncertainty as to whether these wind farms will be allowed will blight areas such as Glyncorrwg and will be a burden to the people living here.
Wales is being asked to provide a disproportionate percentage of the UK national target for wind farms. This has led to accusations of the Welsh Assembly being a “soft touch” and being closely associated with multi-national firms e.g. Gamesa which will benefit from this development.

The TAN 8 proposals are ill conceived, naive and of little benefit to Wales or its people. TAN 8 will damage the credibility of the Assembly and bring into question whether devolved government is best for this country. The Assembly should be fighting against these proposals not proposing them. I hope the Assembly will see sense and drop these proposals.

How do the TAN 8 proposals fit with the Welsh Assembly social inclusion policy? This is supposed to be about helping disadvantaged places like Glyncorrwg. This has placed an added burden on this community.

The new Welsh Assembly building has recently won a green award for building design. How surprising that they did not include wind turbines in their plans for the new building! Cardiff Bay is a windy place and a perfect spot for wind turbines. It could have been a showcase development for something they have a strong belief in for other places.

All the above points have been communicated to the Welsh Assembly.

4. GLYNCORRWG/ECO2 APPLICATION

— Most people do not want the landscape destroyed and there is great concern about the impact on tourism which we are trying to develop. We do not believe wind farms attract tourists, we think they deter them. Voluntary groups and individuals have worked hard to try to regenerate Glyncorrwg by visitors who love the peace and wild beauty of our hills. Wind farms will not help these developments.

— This area has suffered enough. For over a hundred years Glyncorrwg and the surrounding area paid enormous sacrifices in coal mining. The local landscape was seriously affected and many people suffered ill health from working in the mines. Now just as the scars are healing we are being asked once more to sacrifice the local landscape for the energy needs of the country.

— We are not convinced about the viability of wind turbines and we see this as an opportunity for multi-national companies to make even more money by imposing these industrial installations on small vulnerable communities.

— The proposed percentage of wind energy that this area will produce under TAN 8 will have devastating effects on the landscape. Surely the disproportionate contribution that our area will be making is totally unfair. Glyncorrwg is identified as being a ward of high deprivation which needs a lot of support in what it is trying to achieve. We are listed at 24 out of 865 wards in the Multiple Deprivation index for Wales. This will not help this community but place a greater burden on it and a strain on individuals many of whom are elderly or suffering ill health.

What has happened as a result of TAN 8 is that developers are now hovering over the area like vultures. There is now a free for all. According to Neath Port Talbot CBC, 11 firms have expressed an interest in placing wind farms in the council area. I have heard that six of the proposals relate to Glyncorrwg and environs. The landscape of Wales is being bought and sold by developers many of whom are based in Europe, for example, Cefn Croes wind farm is owned by Falck based in Milan.

The role of the Forestry Commission needs to be clarified. If the Welsh Assembly controls the Forestry Commission and is encouraging wind farm developers to use or have access to land through Forestry Commission land it has a financial interest in this matter. There is therefore a conflict of interest. This issue has been raised in Scotland, see The Scotsman article attached at Appendix 1.

Eco2, a Cardiff based firm, has proposed to place six 400 feet wind turbines half a mile from the village. The turbines will be bigger than Big Ben and as high as the London Eye. A petition against the proposal has been circulated and a majority of people in the village have signed. Many politicians and civil servants talk about wind energy but have they thought about the effects it has on a small vulnerable community?

The main concerns are:

— It will spoil an area of outstanding natural beauty
— Wind farms are ugly, inefficient and will spoil the wild beautiful areas around the village.
— It will undermine the attempts by residents, the local authority and other bodies to regenerate the local community after decades of decline.
— It will undermine work done to encourage tourism through the Glyncorrwg Pond project and mountain biking. This project has been established by local people to attract tourists, mainly for mountain biking. Recently one of the bike trails was hailed as one of the most popular in the UK. A considerable amount of public money and voluntary effort has gone into making this project a success.
— There is also concern about the effects on house prices, TV reception and wildlife.
— Many people feel that others will be deterred from visiting or moving to Glyncorrwg.
— Concern has also been expressed about the effects on health on this matter there have been two studies by GPs see The Daily Telegraph article attached at Appendix 2.

Many individuals have been affected by this development and case studies can be provided if required. The developer has offered community benefits which many see as bribes. In this disadvantaged community this has swayed some people into accepting the unacceptable. Farmers who have lost income see wind farms as a meal ticket. Our fight against the wind farm developers is one of David against Goliath, big business against small vulnerable communities.

5. Recommendations

— Glyncorrwg needs support and protection from the Welsh Assembly Government not labelling as a “strategic area” under a plan, which will seriously spoil the future development of this area.
— A moratorium should be called on any new developments to assess the viability of existing wind farms. Wales has contributed more than its fair share of energy from wind sources.
— There needs to be an independent review of the TAN 8 proposals.
— These developments should be more equally distributed within Wales and throughout the UK.
— There should be more guidance on how close wind farms can be to houses.
— Measures should be introduced to prevent the free for all by developers, that is taking place in areas such as Glyncorrwg.
— Strict guidelines need to be introduced on community benefits.
— There should be stricter guidelines on consultation between the communities affected and wind farm developers.
— Help should be provided to anti wind farm groups to combat the ruination of their area. This is a David v Goliath situation.
— The role of the Forestry Commission needs to be clarified with regard to the Welsh Assembly.

I was surprised to see the DTI civil servants using British Wind Energy Association statistics when they gave oral evidence to your committee on 31 January 2006. This is a trade association which promotes wind farms how can it be seen to be objective. It is also aggressive when encountering opposition. Does the Department of Health use statistics from trade associations when discussing smoking and alcohol consumption? The DTI web site also uses BWEA statistics; it needs to be fairer and to give both sides of the argument. At the moment it is blatantly biased towards wind farms. In a democracy this is unacceptable.

There are powerful arguments against wind farms:

Are they the best use of resources?
Should more effort be put into energy efficiency and energy conservation?
Would the money be better spent helping people to replace inefficient boilers?
What is being done to reduce the number of cars on the roads?
Why isn’t more freight being carried on the railways?
What is being done to curb pollution from air travel? No attempt has been made to control the number of flights or the expansion of regional airports.
Should supermarkets encourage people to buy beans from Kenya or asparagus from Peru? These products have to be transported and this increases gas emissions. Why not place an emphasis on buying locally sourced products.
What is being done by the public sector to improve energy efficiency?
How many streetlights do you see that are on 24 hours?
How many offices and shops do you enter where the heat is intolerable?

Should not the above points have been considered before ruining parts of a beautiful country’s landscape with these hideous installations? Wind farms are gestures; they are a knee jerk reaction. They have a part to play but please do not allow the further desecration of the Welsh landscape.

Do not allow communities like Glyncorrwg to be sacrificed on a green altar.

14 February 2006
Written Evidence from WWF Cymru

WWF believes that any consideration of energy should include the major impacts that many production and consumption methods have on the environment. Energy production and use is a major contributor to climate change, mainly through carbon dioxide (CO₂) emissions from fossil fuel combustion. It is therefore a major component of Wales’s ecological footprint, an indicator of sustainable development adopted by the Welsh Assembly Government. The direct use of energy and the energy used in the production of goods and services is a major component of the footprint.

Therefore, we believe that consideration of the portfolio of energy in Wales should encompass the goal of reducing the impact of energy production and consumption on climate change and ecological footprint.

WWF supports the findings of the Royal Commission on Environmental Pollution (RCEP) which suggests that the UK will need to reduce its CO₂ emissions by 60% by 2050. If such dramatic reductions are to be achieved, action must be taken now in the energy sector to improve energy efficiency and move to lower or zero carbon electricity generation technologies.

WWF believes that the UK has an excellent potential for achieving emission reductions through energy efficiency and a move to renewable energy sources. It is crucial that both the demand and the supply side are addressed by energy policy in an integrated fashion. All energy sources have some environmental impact. It is thus necessary to both opt for the best environmental option and to minimise the demand for energy.

Much can be achieved through energy efficiency. UK households waste £6.5 million a year by being energy inefficient, yet the technologies exist to drastically reduce domestic energy consumption, both through more efficient buildings and through more efficient appliances.

Renewable energy sources are either emission free or carbon “neutral”. In WWF’s view, the most benign renewable energy sources include onshore wind, offshore wind, biomass (including energy crops, forestry and agriculture residues, wood waste), solar (photovoltaics and thermal), small scale hydro, wave and some tidal technologies, landfill and sewage gas (based on anaerobic digestion). WWF does not consider energy from the incineration of municipal waste as a renewable resource, as most of the waste is made up of non-renewable materials.

Note our support for tidal technologies is highly conditional on location and the impact they have on natural ecosystems. We do not support recent proposals for a tidal barrage across the Severn Estuary, since it would remove the ebb and flow of the tidal estuary and impair the natural flow of the river. Many internationally important species and habitats depend on these natural rhythms, and the estuary has international designations to protect them. Destroying irreplaceable wildlife sites for the sake of energy generation is not a sustainable option, and would contravene the Welsh Assembly Government’s duty to promote sustainable development. However we strongly recommend that more suitable technologies are deployed to capture the energy of the Severn Estuary, such as stand-alone tidal generators, tidal fences and tidal lagoons.

In the short to medium term, fossil fuels will continue to play a major role in the UK’s energy mix. WWF supports the development of Combined Heat and Power (CHP) which dramatically increases the combined efficiency of electricity and heat production. CHP, in power stations, industry and the domestic sector, can thus make an important contribution to emission reductions.

WWF sees gas as an important interim fuel but does not support the development of so-called “clean coal” technologies. These technologies offer little benefit for CO₂ reductions. WWF is also concerned about proposals for carbon removal and disposal from power plants due to the high risks, costs and uncertainties involved.

WWF believes that nuclear energy cannot be viewed as a sustainable technology due to the high risks to the environment and human health associated with its operation and associated waste disposal. In WWF’s view, it is possible to cover the electricity gap created by the closure of the UK’s nuclear capacity by energy efficiency, renewables and CHP.

In support of our position, please find attached two relevant documents.


   This report clearly shows the impact on the footprint of sourcing energy from renewables and improving energy efficiency in Wales. It is therefore, imperative when looking at trends in energy demand in Wales, due consideration should be given to the need to reduce energy consumption in Wales and the role of government and Assembly in demand management to achieve this.

2. The second report is “Turning the Tide. Power from the sea and the protection of nature” by Iwan Ball of Cardiff University. This looks in detail at the potential of marine renewables.

   The major point to note is that WWF believe the Committee should recognise the potential marine renewable energy resource base available in Wales and how this can contribute to future energy security and diversity needs within the principles of sustainable development.

10 April 2006
Written Evidence from Dr Tim Stowe, Director, RSPB Cymru

SEVERN BARRAGE AND SELECT COMMITTEE INQUIRY INTO ENERGY IN WALES

We are grateful that you have agreed to receive a late submission to your Inquiry into Energy in Wales. Following the Welsh Assembly Government’s request to the DTI that a Severn barrage be re-examined, we feel that it is important to set out our views on this proposal for consideration under your inquiry. We have attached a short paper on the RSPB Cymru’s position on a Severn barrage, which has been sent as an addendum to our more detailed response on the wider DTI Energy Review.

Climate change is the greatest long-term threat to biodiversity and RSPB Cymru supports energy generation in ways that minimise greenhouse gas emissions. However, we are very concerned that a Severn barrage would have an irreversible and serious adverse impact on the internationally important habitats and species present in the Severn estuary, including the 65,000 waterfowl that winter there. We do not believe that such a development would pass the test required under the Habitats Directive, particularly as we believe there are alternatives to this project. Additionally, we are sceptical of the overall benefits that are claimed by proponents of the Severn barrage and believe that energy generation from this project is not an option that would be compatible with UK Government and Assembly commitments to sustainable development.

Our position on a Severn barrage is informed by the wider UK energy picture, our views on which are set out in detail in our response to the DTI Energy Review. We would be happy to provide a copy of our full submission to this consultation, but we are aware that brevity is of the essence, given that you have all but finished hearing evidence on your Inquiry. I have therefore summarised the relevant key messages of our response below.

— UK energy policy has the central role in ensuring that greenhouse gas emissions are cut to the extent required by current scientific evidence on climate change.
— We strongly support the approach of the 2003 UK Government Energy White Paper, which set out the need to focus on a prioritised hierarchy of energy conservation, energy efficiency and renewable sources of supply. We believe that this approach now needs to be appropriately resourced in order that government energy and emission targets can be met.
— We consider that the UK’s long term emission reduction target, or a more stringent one, can be met by a combination of demand side management coupled with renewable technologies, perhaps augmented in the medium term by carbon capture and storage.
— The UK Government’s commitments towards biodiversity conservation and international obligations under the Birds and Habitats Directives must not be undermined in delivering renewables, if a sustainable approach to carbon reduction is to be achieved.
— There is considerable evidence that there is sufficient renewable capacity, including micro-generation, together with energy efficiency and demand reduction to achieve the necessary carbon savings from the energy sector without having to affect adversely important wildlife sites.
— In our opinion the UK has in place a suite of policies and measures that form a sound basis both for meeting our long term (2050) emission reduction targets and achieving security and diversity of supply.

I am sure the Committee will be aware that the 2003 Energy White Paper effectively shelved the Severn Barrage proposal on grounds of substantial environmental impact and disproportionate cost. We do not see that anything has changed significantly since 2003 to justify repeating earlier feasibility studies.

17 May 2006

Written Evidence from Dr Carl Iwan Clowes FFPHM

We would like to present the following comments for your attention as part of your review of energy in Wales as we have major concerns about the suggestion of a new generation of nuclear power stations.

THE DANGER OF ACCIDENTS

Our biggest concern is the risk of a serious accident at a nuclear power station. The effect of the Chernobyl disaster in April 1986 is still felt on 359 farms in upland Wales where restrictions on sheep movement are still in force. A serious accident in any nuclear power station in Britain causing the leakage of radioactivity would have a serious effect on the health of thousands of people and force the evacuation of whole areas as was the case with the Chernobyl disaster. Indeed, if there was a North wind at the time of any such accident at Wylfa B, the whole of Wales would have to be vacated, possibly for several years. This is not wild speculation but based on previous history.
People in the nuclear industry are as fallible as workers in other industries and machines and instruments are not without their faults. For example, it was the failure of an oil gauge in a reception tank and the failure of an overflow alarm that caused the blaze at the Buncefield Depot last year. Equally, closed circuit television operators failed to spot the overflow with the result that black clouds billowed from the terminal covering hundreds of square kilometres for many days. If this had been a nuclear accident...?

Similar defects happened at the THORP plant in Sellafield when 83,000 litres of nitric acid containing enough plutonium for 20 nuclear bombs leaked onto the building's steel floor. A large pool of radioactive liquid was discovered in mid April 2005, a whole nine months after the leak started and only when it had grown to half the size of an Olympic swimming pool. Once again, the unexpected happened. Other accidents in the nuclear industry include the Windscale fire in 1957 which led to the release of radioactivity into the atmosphere and Three Mile Island in the United States in 1979 when a partial melt-down of a reactor occurred.

In 1993, it was luck more than anything else that prevented a far more serious incident from happening when a fuel grab fell into a reactor channel at Wylfa nuclear power station. Radioactivity was released into the atmosphere and Wylfa’s operators Nuclear Electric were fined in Magistrate and Crown Courts for pollution offences and safety breaches.

It is self-evident that there will be another serious nuclear accident somewhere in the world and we don’t want to see such an accident happening under our watch.

**A TERRORIST ATTACK**

A terrorist attack could occur on a nuclear power station. An easier target, as the nuclear specialist Dr John Large argued in a recent report for Greenpeace, would be the trains carrying nuclear waste from nuclear power stations for reprocessing at Sellafield, travelling along the same lines at the same time each week. There is international evidence that terrorist groups consider the nuclear industry as a target. Russia recently foiled a plot by Chechnyan rebels to attack a Russian nuclear power station and, closer to home, documents and a map of Sizewell nuclear power station were found in the car of one of the London suicide bombers on 7 July last year.

**OTHER CONSIDERATIONS**

A debate has developed in Anglesey around the need for Wylfa B in support of Anglesey Aluminium, the other major employer on the island. Unfortunately, the arguments have paralysed any meaningful debate about the need for an economic development strategy not based simply on one industry. In the current climate, with the demands for metal increasing alarmingly, who is to say that the aluminium industry will not move nearer to the markets of the far-East, whatever the relationship with the local electricity supplier?

The concerns around waste disposal from the nuclear industry remain and, of course, the concerns in relation to terrorist attacks on deposited waste apply as above.

There is no doubt that the nuclear industry has a negative impact on tourism in the north of the island, a factor that militates against development and further employment in the industry.

Even if all the above objections were put to one side, we have serious concerns about the cost of a new generation of nuclear stations. It would appear that it is impossible to create a balanced business case for the stations without annual subsidies of many billions of pounds. As the industry has already had billions of research money, it is difficult to deny that such investment would better be spent on conservation of energy and researching alternative sources of production.

**THE WAY AHEAD**

We would like to see consistency between your review of energy in Wales and the opinion expressed by the National Assembly Government. The Government with support from the Assembly opposition parties believe no new nuclear power stations should be built in Wales. We believe that there is great potential for renewable energy in Wales. Developing renewable sources such as wind, tidal and wave marine, solar, biomass and others, alongside a comprehensive programme of energy conservation would show leadership from a small nation in the effort to reduce carbon dioxide emissions into the atmosphere.

Further, we emphasise that the House of Commons Environmental Audit Committee has opposed building new nuclear power stations and the Committee’s report urged the Prime Minister to look again at the actual findings of the 2002 Energy Review which put great emphasis on renewable energy and energy conservation.

We urge you, therefore, to present a report which will echo the opinion of the Environmental Audit Committee and Wales National Assembly and give renewable energy technologies and conservation a fair chance to be developed for the sake of present and future generations.

10 June 2006
SUMMARY OF RECOMMENDATIONS

The WOF PV Group strongly recommends the following Actions in order to secure the successful future development of the PV industry in Wales.

— The need for government stimulation is paramount. This may be via direct investment, via regulation (eg building regulations) and via example/demonstration (ie inclusion in new public buildings).

— The industry should seek to fill identified gaps in the supply chain via inward investment, new start-up and spin-out companies and demonstration programs.

— The research infrastructure should be stimulated to ensure that Welsh PV research remains at the leading edge. This applies to all forms of research and development, including universities, industrial R&D and other organisations such as Techniump and WERC.

— Public education and awareness should be promoted, both as a long-term strategy and in order to support any Government initiatives. To this end the Group recognises a need for developing media relations via a press officer, and also for appointment of a high-profile Welsh PV “Champion” or spokesperson.

1. INTRODUCTION: THE GROUP

The Welsh Opto-Electronics Forum (WOF) Photovoltaic Group was formed in recognition of the unique opportunities currently existing for the Photovoltaics (PV) industry to establish a strong base in Wales.

PV is a rapidly growing technology industry and the Group recognises and supports the high quality of current Welsh expertise in a large number of major supply chain links.

The Group aims to represent the industry in Wales as a whole, to facilitate building upon the existing skills base in order to strengthen the industry further, and to act as an advisory and information-disseminating body to present the overwhelming case for PV as part of an integrated energy policy.

Members of the Group include industrial manufacturers and installers, university researchers and Government representatives at both Welsh Assembly and Local Authority level.

2. PV TECHNOLOGY

Photovoltaics is an attractive, clean, renewable energy source with many advantages as part of an integrated energy policy. Its suitability for integration into the built environment enables it to side-step some of the issues associated with other renewable and clean energy options.

Photovoltaics includes a whole raft of current technologies, from the mature crystalline silicon technology, through various types of thin-film technology (amorphous silicon, compound semiconductor (GaInP/GaAs) and polycrystalline compound semiconductor (CIGS, CdTe), to dye-sensitised (Gratzel) cells and the newer nanocrystalline and polymer technologies. Thus there is a range of potential solutions to match various application requirements, and also a range of approaches to the important issue of reducing the cost (Cost per Watt) of PV-generated power.

This cost is dependent upon a number of different factors, including materials costs, energy costs, yield (throughput) and conversion efficiency. For example crystalline silicon technology is currently able to obtain the fairly high conversion efficiency in production of around 18% (around half of the theoretical maximum limit), but the materials costs are high compared with thin-film technologies, and the current world shortage of silicon represents a limiting factor. Similarly thin-film GaInP/GaAs cells have high manufacturing costs which are offset by the higher achievable conversion efficiencies of 35–40% (depending upon cell design), while polycrystalline thin-film technologies with lower conversion efficiencies have potentially lower manufacturing costs. Some of the newer technologies, while currently having conversion efficiencies of only a few percent are potentially extremely cheap to produce. Clearly then, research and development is an important ongoing element of the PV industrial support structure and will undoubtedly play a vital part in informing and driving future industry success in reducing the cost per Watt to a competitive level.
Fig 1 shows the projection of the European Photovoltaic Industry Association (EPIA) on reducing PV energy costs in Europe. The figure shows that PV is expected to achieve competitive price levels (in Northern Europe) by 2020. This projection takes into account the expected levels of government stimulation for the industry in countries such as Germany and Spain. The WOF PV Group believes that investment and support for the PV industry in Wales at the present time will ensure that Wales also has the industry and infrastructure to take advantage of what is clearly expected to become a major source of renewable energy in the future.

Although, the short term view is that PV Solar energy is expensive compared with conventional fossil fuels, the projection is that it will become price competitive in Wales beyond 2020 as indicated in Fig. 1. The proposed strategy is to have substantial support to expand the installation programme in Wales up to 2020 so that there is the capacity for economically viable expansion beyond 2020.

![Figure 1](img)

**PROJECTED REDUCTION IN PV ENERGY COSTS IN EUROPE. REPRODUCED FROM THE EUROPEAN PHOTOVOLTAIC INDUSTRY ASSOCIATION (EPIA) ROADMAP DOCUMENT**

Other important advantages of PV as part of the energy supply structure result from its distributed nature. This makes it ideally suited as part of a strategy to ensure supply protection against terrorist threats and security of supply via diversification of production. Furthermore it reduces stresses on the grid system which can arise from large localised inputs.

3. PV in a Global Context

Germany is the world’s leading PV adopter and has the largest share of the global market, with Germany, Japan and the US accounting for fully three-quarters of the market at the present time. The cost of PV is falling year on year and production increasing rapidly. In 2005 a total of 1,727 MWp of PV cells were produced, representing an increase of 45% over 2004. This is part of a steady growth trend over a 15 year period, largely due to market introduction programmes, rural electrification programmes and materials and process technology development.

Figure 2 shows the distribution of worldwide PV installation in 2004. The UK represents less than 5% of the 8% European (excluding Germany) share. Nevertheless an increase of around 40% per annum in the UK would generate 23% by 2023.
Despite the small contribution of the UK to worldwide PV installation, the UK has several major manufacturers, including Sharp, the world leader with a market share of 24.8% (2005 figures).

The EU is committed to achieving 12% (total) and 21% (electric) energy via renewable sources by 2010 in order to comply with the Kyoto Protocol. However, there exists at present no unified European PV policy. This has led to widely different approaches by the various member states. Between 2001 and 2003, PV in the E.U. doubled as a result of the highly successful German programme (accounting for 70% of installations). Installations in Spain and Austria also doubled during this period. The success of the German programme is attributable to a strong government support programme introduced in 2000 and updated in 2004, and utilising feed-in tariffs and guaranteed prices paid by utilities, as detailed in the European Photovoltaic Industry Association (EPIA) Roadmap document1.

A total of 6,000 MWp PV capacity is forecast for the EU by 2010. New installations are expected to increase at a rate of 20–25% per annum, with research and development programmes resulting in steadily decreasing costs.

4. The Current Position in Wales

While the potential domestic market in Wales is relatively small, the quality and range of expertise and the existing industrial supply base offers an excellent opportunity for its development as a key centre in the worldwide PV market.

Established manufacturing expertise includes module assembly (Sharp, market leaders operating in Wrexham) and world-class III/V (compound semiconductor) production (IQE, Cardiff) together with substrate manufacturers and systems and installation companies together representing many years of successful experience.

The PV research capability in Wales is also broadly-based and well-integrated, with particular strengths in fundamental thin-films and materials (Bangor) as well as power electronics (Swansea), energy efficient building design (Cardiff) and hydrogen energy research (Glamorgan).

Appropriate specialist personnel are currently readily available in Wales, and the capacity exists for local training programmes to cater for an expanding requirement.

Overall this provides many strong elements in a complete PV supply chain, and is a good basis for addressing some of the remaining identified weaknesses such as cell manufacture (particularly crystalline silicon) and quality assurance and testing.

5. Future Opportunities for Wales

The Welsh Assembly Government is committed to a sustainability agenda. Its devolved Planning function, together with the developing nature of the Welsh Energy Policy provide a unique climate for stimulated development of a strong Welsh PV industry.

— PV offers an opportunity to maintain a serious commitment to sustainability while mitigating some of the problems associated with other clean energy sources arising from the sensitive nature of much of the Welsh environment and countryside.

— Wales is geographically compact with a degree of autonomy which encourages good communications and mutual support networks within industry, within research groups and between industry and research. It is therefore well-placed to develop a complete, relatively independent multi-faceted technology industry.
The domestic market is capable of responding quickly to stimulation provided by the Government via Planning or Building Regulations support (e.g., guidelines with respect to public buildings and/or new housing build). Because Wales has only 22 local authorities (compared with over 300 in England) there is an enhanced possibility of developing a coherent Welsh PV strategy. In Wrexham alone there are some 15,000 local authority housing properties requiring major renovations in the near future. A large-scale housing stock renovation program would provide opportunities for new PV installations in a similar way to the opportunities provided by new build, and the provision of low-cost energy throughout their lifetimes would help to offset the initial installation costs. The current need for renovation programmes is not unique to Wrexham, but exists throughout Wales as a whole.

The status of the grid in some areas of Wales makes the low-power, distributed input offered by PV a more attractive option than large-scale localized input which may cause difficulties by straining the grid’s local capabilities.

A Government-led support programme for the PV industry in Wales would have the knock-on effect of indirectly supporting the Welsh economy as a whole, attracting private investment and providing more high-quality jobs.

The WOF Photovoltaics group believes that a target of at least 10% of renewable energy generated via PV in Wales by the year 2020 is a realistic expectation.

The WAG Energy Wales Route Map document’s target for renewable energy generation is 7TWh by this date. This would require a total installed PV capacity of 875MW. This is easily achievable within the present manufacturing capacity in Wales of 120MW/yr.

875MW installed capacity is equivalent to around 437,000 houses each with small 2kW rooftop installations, or fewer if larger installations on public buildings and factories are also contributing to the total.

References:
1 European Photovoltaic Industry Association (EPIA) Roadmap. (Fig 1: Original Source: RWE Schott Solar)
2 Strategies Unlimited: Global Analysis of PV Markets & Application Forecasts.
5 Welsh Assembly Government: Energy Wales, Route Map to a Clean, Low-Carbon and more competitive Energy future for Wales.

Written Evidence from G M Ball, PACT

I am writing to you as both secretary of PACT (Protecting And Conserving Together—Anti-Open cast Group in Kenfig Hill and district) and also as an individual.

As you are well aware, this year has had a long drawn out winter and summer seemed to be never arriving. At last the sun has returned and families are able to enjoy outdoor living in their gardens, the surrounding environment and local countryside amenities.

It is therefore so ironic that, as soon as the people emerge from their houses, then so do the diggers from the local open cast site, throwing up dust clouds and releasing diesel fumes into our fresh air. A new phase of soil stripping has begun, bringing with it all the problems that this operation brings. Once again, people living near to the site are experiencing respiratory, and skin and eye problems. Windows and doors are having to be kept closed, even though temperatures are hitting the high 80s.

We were told, when complaints were made recently, that a Welsh Assembly agricultural representative had given the go-ahead for this operation to begin and that this last phase of opencast was also agreed previously by planning. When speaking to the local council officers, we were assured that pollution levels were poor to moderate anyway and that the open cast was working within “acceptable” limits. But to whom is it acceptable? It is certainly NOT acceptable to the people. They are the ones who know the impact best. They are the ones who can provide first-hand information to the experts, visually, environmentally and health related. If everyone is going to be a part of decision making as is now promised, then everyone should certainly be a part of decision making with regard to the open cast. Democracy is a game with many different players, but health and the environment is an area that everyone should be able to play a part in.

At the moment, dust clouds are blowing towards Cefn Cribwr, Kenfig Hill and Pen Y Bryn. We are breathing in PM 2.5s each day, as well as low grade diesel fumes. If we complain, we are called nimbies, but what is a nimby? As secretary of PACT, I have had complaints off people living two to three miles away from the present site. That makes it not just the “in my back yard” syndrome!
New evidence is once more emerging on particulates and diesel (see enclosed reports) and, although there seems to be a block on these reports in the UK, they reveal probably the most important evidence to prevent the extension being allowed since the year 2000. What is evident from the study on particulates is that the effects of cumulative ingestion of PM 2.5 particulates has definite effects on health, especially respiratory and cardio-vascular related disease, resulting sometimes in mortality. (PM 25s are still not measured in the UK!!)

Last week PACT attended a talk on sustainability. We were all told to be individually responsible. But where is the example coming from? It is certainly not by allowing polluting industries, such as opencast, to continue. The Welsh Assembly have also spent a lot of money producing an environmental strategy for Wales with wonderful ideas and plans for the future. Throughout it a need for balance between industry and the environment is referred to. But, when threshold levels are far too high, allowing polluting activities to continue, what happens to the needs of the people? If thresholds were lowered, then people would not be suffering as they are now. The door is open for councils, businesses and the governing bodies to get out of the lack of balance that exists now.

We cannot change the past, but Wales could have a cleaner, better future from now on.

Could somebody in the Government or the WAG also answer the question “Why is Wales the worst health blackspot in the UK, Europe and possibly the world?” Are we all a nation of lazy, socially deprived, poor diet conscious, smoking beer drinkers? I think not! It is obvious to the non-expert that it is industrial pollution and its legacy that is causing the ill health.

We believe that the excuse that is always given to us by council officials when we complain, that the source of the pollution cannot be specifically identified, is NO excuse to allow even more industrial pollution in the form of opencast to be placed in an area that is already vulnerable, having high cases of serious illnesses. We want a presumption against opencast so that the precautionary approach is rigidly adhered to and is NOT just an option for the decision makers. If it is possible for coal to be burned cleanly, and there is a future for it in Wales, then proper investment for extraction methods such as underground mining or the new technology of coal gasification should be the only options, making opencast a thing of the past. This would prove that the government are genuine about their environmental concerns and would provide the balance between the environment and the needs and health of the population. To allow opencast mining to continue is political hypocrisy.

We have also been told by local council Planning Officers that the HIA on the Parc Slip/Margam opencast extension and the Coal M Tan can be used and referred to as little or as much as the councils decide. Where does that leave the communities living close by?

In the past you have voiced your concerns on our behalf, and for this we are very grateful. Please could you help us once again?

13 June 2006