House of Commons

Energy and Climate Change Committee

The Impact of Shale Gas on Energy Markets: Government Response to the Committee's Seventh Report of Session 2012–13

Third Special Report of Session 2013–14

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The Energy and Climate Change Committee

The Energy and Climate Change Committee is appointed by the House of Commons to examine the expenditure, administration, and policy of the Department of Energy and Climate Change and associated public bodies.

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Gemma Doyle MP (*Labour/Co-operative, West Dunbartonshire*)
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Publication

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/ecc.

The Reports of the Committee, the formal minutes relating to that report, oral evidence taken and written evidence from witnesses are available in a printed volume.

Committee staff

The current staff of the Committee are Sarah Hartwell-Naguib (Clerk), Liz Bolton (Second Clerk), Dr Alfred Gathorne-Hardy (Committee Specialist), Tom Leveridge (Committee Specialist), Luanne Middleton (Inquiry Manager), Shane Pathmanathan (Senior Committee Assistant), Jonathan Olivier Wright (Committee Assistant), Joe Strawson (Committee Support Assistant), and Nick Davies (Media Officer).

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Third Special Report

On 26 April 2013 the Energy and Climate Change Committee published its Seventh Report of Session 2012–13, *The Impact of Shale Gas on Energy Markets* [HC 785]. On 17 July 2013 the Committee received the Government's response to the Report. It is appended below.

Appendix: Government Response

The Government welcomes the Energy and Climate Change Committee's report on the impact of shale gas on energy markets. Unconventional gas reserves, and particularly shale gas reserves, have the potential to have a significant impact on future gas markets. This has been apparent in the United States. Between 2007 and 2012, US net gas imports fell by 55 per cent and by 2020 the US is expected to be a net exporter of natural gas. This has increased US security of supply and balance of payments.

The extent to which the US experience can be replicated in the UK is uncertain. However, the Government is committed to ensuring that a world-leading framework for investment is in place so that if the conditions are right the industry can prosper.

The industry estimates that it will have to drill 20 to 40 wells over the next 2 years in order to establish the commercial viability of extracting shale gas. The Government is putting in place the regulatory conditions, planning regime and tax scheme necessary to encourage the development of these exploration wells. In addition, the industry has come forward with a scheme of community benefits so that those local people who host shale gas developments can share in any proceeds.

This response has been prepared by the Department of Energy and Climate Change (DECC) with input from the Office of Unconventional Gas and Oil, HM Treasury, BIS, the Department for Communities and Local Government, the Environment Agency and the Health and Safety Executive.

The Committee's recommendations are shown in bold and the paragraph references at the end of each recommendation correspond with those in the Committee's report. The Government's response is given beneath each recommendation or group of recommendations.

The US shale gas revolution

1. We conclude that because the US is the only country to have developed a shale gas industry, it can serve as a useful case study when considering how a shale gas industry might develop in the UK. Some of the factors which facilitated the US revolution, however, do not apply to the UK and so development of the UK's shale gas industry is likely to be different to the experience of the US. ***The UK should learn the lessons of the US experience, including creating a favourable climate for companies to operate in, while ensuring environmental damage is avoided.*** **(Paragraph 13)**

The Government agrees that there are many lessons to learn from US experience, although allowance has to be made for the many differences in regulatory practice and requirements between the UK and the US, and between different States within the US. We have already benefited from many valuable reports from the US, including from the Secretary of Energy's Advisory Board and the National Academy of Sciences. DECC officials have also visited Washington, Houston and Pennsylvania over the last twelve months to learn at first hand from regulators, industry and other interest groups.

While the UK will benefit from the fact that the drilling and fracturing techniques used in the US are generally transferable to the UK, there is a very different regulatory environment in the UK. The UK has over 50 years of experience of regulating the onshore oil and gas industry nationally. In addition, the UK has a strong regulatory regime for exploratory activities but we want to continuously improve it.

The Office of Unconventional Gas and Oil (OUGO) is working closely with regulators and the industry to ensure that the regulatory regime is as streamlined as possible while remaining robust enough to safeguard public safety and protect the environment. The Government will publish in July a comprehensive package of measures to enable shale gas exploration, including a consultation on tax incentives and up to date technical planning guidance for industry, planning authorities and communities. In addition, the Environment Agency has published its plans to streamline the regulation of exploration activity whilst maintaining environmental protection. For its part, the industry though the UK Onshore Operators Group (UKOOG) have come forward with a Community Engagement Charter incorporating a benefits package. These measures will help to give the UK a world-leading regime for investment.

Defining shale gas estimates

2. We conclude that it is right for the Government to exercise caution over shale gas estimates given the uncertainty and confusion over definitions. ***If and when the Government does decide to issue estimates of UK shale gas resources it should set a good example and ensure that it is explicit about which definition it is using. We recommend that it should use the definition which is most relevant to the general public, which in our opinion is recoverable resources. The Government should also clearly communicate the uncertainty inherent in some of these figures by emphasising the difficulty of producing an accurate estimate of shale gas.*** **(Paragraph 16)**

The Government agrees on the desirability of clarifying resource estimates and of communicating inherent uncertainties. At present, neither DECC nor the industry currently have the engineering, geological or cost information to make a meaningful estimate of recoverable reserves.

Scientists from the British Geological Survey (BGS) have estimated that the total volume of gas in the Bowland-Hodder shale in northern England is some 1300 trillion cubic feet (central estimate). The BGS study is the first in the UK to provide investors, operators and regulators with an indication of where to target future exploratory drilling. But until some experience is gained on the long term productivity of actual wells, it will not be possible to estimate the proportion which might technically be produced, or the economic productive potential. DECC has also commissioned work from BGS to survey the gas in place in the

Weald region of Sussex, which will also be published in due course. Surveys for other regions will be commissioned as appropriate.

We will continue to be explicit about the definitions we use and emphasise that the difference between 'gas in place' and the proportion which is 'technically and economically recoverable' is as yet unknown and requires further exploration and appraisal.

Calculating shale gas estimates

3. We conclude that it is impossible to determine reliable estimates of shale gas in the UK unless and until we have practical production experience. ***Therefore, if companies can demonstrate that they can meet the required standards the Government should encourage exploratory shale gas operations to proceed in order to improve current estimates, providing that public concern over environmental impacts is recognised and taken into account. It should require shale gas companies to share their gas content and production figures with relevant research bodies (subject to commercial confidentiality).*** **(Paragraph 21)**

The Government agrees that effective exploration and testing of the UK's unconventional gas resources is a necessary foundation for understanding the potential of this industry. It is creating the right framework to accelerate shale gas development in a responsible way. Last December, we announced that fracking could resume with robust regulation and there is nothing now stopping licensees bringing forward new drilling plans and seeking the necessary planning permissions and consents.

Companies should also engage early with communities on the prospective impacts in their area, including environmental impacts, as well as setting out the potential benefits. We therefore welcome the Community Engagement Charter recently launched by UKOOG which includes the commitment from industry to engage with communities prior to any application for planning permission.

We recognise that, in the present circumstances, where we and the industry seek the early characterisation of a geological resource which is as yet poorly understood, it would be desirable to promote early sharing of data. We welcome the willingness expressed by Cuadrilla's Chief Executive, in his evidence to the Committee, to share data on a commercially confidential basis.

However, geological and production data is only obtained through substantial investments by the operators, and it is only reasonable that they should be able to reap the commercial benefits for an appropriate period before it is made available to other commercial interests.

The licences already require that all well results are made available for release by DECC's agents after four years. This is by no means unusual – in some States of the US, the confidentiality period is ten years or more. But most oil-producing States have a confidentially period of three to five years, similar to UK practice.

Latest shale gas estimates

4. While it is unlikely that offshore shale gas will be pursued in the near future, strategically, it may have the most potential for the UK in the medium to long-term,

especially if it avoids public opposition associated with onshore operations. ***We repeat the recommendation made in our previous report that DECC encourage the development of the offshore shale gas industry in the UK, working with the Treasury to explore the impacts of tax breaks to the sector. This must be done before the UK's North Sea oil and gas platforms are decommissioned, otherwise the opportunity to utilise the UK's offshore oil and gas assets may pass.*** **(Paragraph 29)**

The Government agrees that shale gas has the potential to provide the UK with greater energy security, growth and jobs and it is encouraging safe and environmentally sound exploration to determine this potential. At Budget 2013, the Government committed to introduce a new tax allowance for shale gas and to extend the Ring Fence Expenditure Supplement for shale gas projects from 6 to 10 years. The Government will issue consultation on the details of these changes by 18 July.

While the costs of offshore drilling and production operations would be many times those of onshore operations and are therefore much less likely to be economic in the short-term, the Government agrees it would be prudent to assess what support could be offered to encourage this development in the longer term. The consultation on changes to the tax regime for shale gas will therefore seek views on the longer term potential for offshore shale gas production.

Public perception

5. One key to community acceptance will be a robust factual response by government to scare stories. The other key to ensuring public acceptance of the shale gas industry is community engagement. Engagement should be early and businesses need to be able to demonstrate that they are both listening and responding to community concerns. ***The Government should consider whether it would be appropriate for the new Office of Unconventional Gas and Oil to provide advice and support to local communities living near potential shale gas developments, taking into account the need to address perceptions that the Office may be too closely linked to industry.*** **(Paragraph 34)**

The Government agrees that early community engagement by companies is key for public acceptance of shale gas development. We are working with industry to further encourage effective engagement that addresses concerns raised.

The Government also recognises that it has a role in supporting public engagement by ensuring that the debate on shale gas is supported by evidence-based information. One of OUGO's objectives is to help people understand the facts about shale gas, including by supporting local authorities' engagement with their communities to help resolve any issues and allow projects to proceed where appropriate.

6. Communities who are affected by shale gas development should expect to receive, and share in, some of the benefits of the development. We support the Government's intention to ensure that local communities will benefit from shale gas projects in their area. ***We recommend that the Government explores ways of sharing substantial material benefits with local communities. In the same vein as the recommendation in our Building New Nuclear report, one option the Government could consider is extending the scope of its proposal to allow local authorities hosting renewable energy projects to retain business***

rates to include shale gas developments. A mechanism for sharing substantial material benefits with local communities should be ready to be offered to communities in time to encourage them to take a positive view of the prospect of commercial shale gas operations beginning in their locality. **(Paragraph 37)**

The Government agrees that communities that host shale gas developments should share in the benefits which are created. UKOOG, the industry body, has published its Community Engagement Charter that includes a commitment to engage with communities early at each stage. The community benefits package also includes: £100,000 in community benefits will be provided per well-site where fracking takes place at exploration stage; 1% of revenues in community benefits at production stage; publication of evidence each year of how these commitments have been met; and regular reviews of this package as the industry develops.

The Government has also already recognised the value in delivering a financial incentive for local authorities to be proactive in encouraging economic growth in their area. Under the previous system of funding for local government, local areas received no benefit from attracting new development to their areas. All of the business rates collected by councils were returned to Whitehall for redistribution as Formula Grant. The Government has fundamentally reformed that funding regime through the Business Rates Retention Scheme introduced in April this year. Authorities will now keep nearly £11 billion of business rates paid by businesses in their area, together with any growth on that share.

These new arrangements will mean that councils will be better off as a result of growth - the more they grow, the greater the financial reward. It will mean that councils hosting new shale gas developments paying business rates will be better off. Councils will keep up to fifty pence in every pound of business rates growth in their area, providing a significant revenue boost for reinvestment in their communities.

Regulation

7. We welcome the Government's attempts to minimise the regulatory burden on companies by streamlining processes and avoiding duplication where possible. However, robust regulation of the sector in order to protect the environment and ensure the health and safety of workers is absolutely essential in itself as well as to ensure that the shale gas industry is to be accepted by the general public. ***We recommend that the Government maintains the highest standards of protection in environment and health and safety procedures. When the Government provides detail of the objectives, remit and responsibilities of the Office of Unconventional Gas and Oil should include clear lines of accountability to a single Minister responsible for the Office. The Government must also demonstrate how it intends to avoid any potential conflict of interest arising from the different roles of the Office.*** **(Paragraph 43)**

OUGO, announced in December 2012, has also been established, and its remit and objectives agreed across Government. It reports to the Minister of State for Energy, Michael Fallon. While OUGO has no regulatory functions and will not take over regulatory responsibility from other bodies, including licensing which is DECC's responsibility, it will co-ordinate activity on unconventional gas and oil (initially focusing

on shale gas) and lead on streamlining and simplifying the regulatory process while ensuring shale development remains safe and the environment is protected.

OUGO's objectives, announced at the Budget 2013 are:

- make the most of our natural resources;
- enable the development of unconventional gas and oil, protect the environment and safeguard the public;
- make sure local communities benefit from development in their area;
- support public engagement; and
- build our knowledge base.

Engagement is the very heart of the Office's remit. Given the objectives of the Office, and that it has no regulatory functions, the Government considers it will be able to fully and satisfactorily address any potential conflicts of interest.

The UK has a strong regulatory system which provides a comprehensive and fit for purpose regime for exploratory activities, but we want to continuously improve it. OUGO will work closely with the regulators and industry to ensure that it is as streamlined as possible, whilst remaining robust enough to safeguard public safety and protect the environment.

We have taken important early steps. In June, the Environment Agency published its own statement of actions to streamline and simplify the regulation of exploratory activity by the oil and gas industry, while maintaining environmental protection. These include ensuring there is a single point of contact for the industry; publishing draft technical guidance for consultation by the end of July, setting out their requirements of operators giving them certainty and significantly reducing the time it takes to obtain environmental permits for exploration. The Department for Communities and Local Government will also introduce guidance, by 18 July, on how shale gas (and other onshore oil and gas) should proceed through the planning system and clarify the interaction of the planning process with environmental and safety consenting regimes.

Tax

8. ***The Government should make an assessment of whether these tax breaks will continue to be required during commercialisation.*** **(Paragraph 47)**

The Government will consult by 18 July on a "pad allowance" for shale gas. This proposal has been designed to incentivise early investment in exploration; maximise the economic production of the UK's shale gas reserves; and ensure a fair return to the taxpayer. The proposed allowance would operate similarly to existing field allowances, by exempting a portion of production income from the supplementary charge – reducing the effective tax rate on that income from 62 per cent to 30 per cent. The amount of production income

exempt from the supplementary charge would be a proportion of–capital expenditure incurred on a shale gas pad (the drilling and extraction site).

This proposal recognises the high upfront costs associated with shale gas projects and means that greater support will be offered to the industry in its early stages when costs per pad are likely to be higher. In addition to consulting on the structure of the shale gas allowance, the Government will seek views on extending the scope of the allowance to all onshore hydrocarbons.

Given that this is a new industry, the consultation on the tax regime will include a request for evidence on project economics and timings, to inform decisions on the level and scope of the allowance and what is required from the regime at the initial exploration phase through to production. As the industry develops, the Government will continue to assess the appropriate level of tax allowance to ensure a fair return for the taxpayer.

Impact of foreign shale gas on UK gas prices

9. We conclude the shale gas revolution in the US has the potential to influence the nature of gas markets around the world. In particular, it could stimulate greater use of gas-to-gas competition in spot markets to determine gas prices rather than oil indexation. However, this would not necessarily guarantee that the price of gas will fall. (Paragraph 52).

As recently as 2008, it was widely expected that US imports of LNG would increase over the coming decades. However, huge increases in shale gas production in North America have turned the US from a gas importer to becoming virtually self- sufficient.

This has reduced the US need for LNG imports and freed up LNG in the global market, increasing the availability of LNG on the spot market and putting pressure on oil-linked contracts. Combined with other factors this has increased pressure to renegotiate some oil-linked contracts in Europe. Gas importers in the Far East, such as Japan, have also looked recently to source LNG outside existing, oil indexed, long-term contracts. Other influences on future gas prices will include the level of global economic activity, rising gas demand in Asia and the availability of further sources of LNG.

The Government agrees that there is no guarantee that gas prices will fall in the absence of oil indexation. However, moves to deliver liquid, transparent, more effectively linked gas markets (through the EU Third Energy Package and other mechanisms) can have a downward effect on gas prices and can enhance security of supply.

10. We conclude that if the US were to begin exporting its shale gas as LNG, the UK might find it economically attractive to import some of this gas. However, the significant transportation costs associated with shipping LNG, combined with expected demand for LNG from Asia, means that the price for this gas in the UK is likely to be significantly higher than that experienced in the US. (Paragraph 56)

The Government agrees with the Committee's conclusions on the likely impact of US LNG exports. US unconventional gas production has had a profound impact on US gas prices. However, recent analysis shows that once processing and transport costs to the UK are

added to US domestic gas prices, the price of LNG delivered to the UK could be similar to the gas price we pay now.

US wholesale gas prices have risen in 2013 and the US Energy Information Administration expects this trend to continue. In addition, liquefaction, shipping and regasification costs will add significantly to the price of any LNG imported from the US. The Oxford Institute for Energy Studies (OIES) estimate that, at US wholesale prices of $5-6/mmbtu, the delivered cost to Europe would be $11.4-12.4/mmbtu. This compares to UK prices (at the National Balancing Point (NBP) of around $11/mmbtu for the year to date 2013.

We welcome the LNG supply contracts between UK companies and potential US gas exporters. US gas producers will seek the best available terms on which to sell their gas and recent prices in Asian markets could mean that US producers will favour those buyers over Europe. The OIES estimate that the transport cost of US LNG to be $3/mmbtu for Asia compared to $1.3/mmbtu for Europe meaning that only a price spread of $1.7/mmbtu or less would make supplies to Europe more profitable than Asia. The spot price for LNG delivered to Japan is materially higher than the UK and the price differential would need to close significantly for future US exports to be routinely directed to the UK.

Large-scale US gas exports could put downward pressure on UK gas prices even if no gas is directly traded; for instance, if US supplies to Asia were to make other LNG sources more available than would otherwise be the case. Significant US exports to all markets would be likely to reduce the variance between the prices in the different markets – all things being equal.

Impact of domestic shale gas on UK gas prices

11. We conclude that it is too early to say whether domestic production of shale gas could result in cheaper gas prices in the UK. It is unlikely that the US experience will be directly replicated in the UK because of differences in geology, public attitudes, regulations and technological uncertainties. Shale oil is likely to be present in the UK but it remains uncertain whether industry will consider shale oil economically worthwhile to explore. (Paragraph 61)

Impact of foreign and domestic shale gas on UK gas markets

12. We conclude that there remains substantial uncertainty about the impact shale gas will have on gas prices, both internationally and domestically, and it is by no means certain that prices will fall a result of foreign or domestic shale gas development. *It would be wrong for the Government to base policy decisions at this stage on the assumption that gas prices will fall (it is possible that they will rise) in the future. However, if large quantities are found they will either bring down prices in the UK, or generate substantial tax revenues, or both – and will certainly reduce imports with benefits to our balance of payments and energy security. For all these reasons the Government should encourage exploration to establish whether significant recoverable reserves exist.* (Paragraph 64)

Economic benefits

20. If shale gas development produces cheaper gas prices in the UK, as a result of the export of shale gas from the US and the development of shale gas in the UK, the energy intensive industries could benefit from lower electricity and chemicals prices. (Paragraph 96)

The US boom in unconventional oil and gas production has been supported by favourable geology, low population density, a competitive supply industry which has developed significant advantages of scale, variable levels of environmental regulation, and strong development incentives for landowners.

While the position in the UK is different, the Government is taking steps to ensure that we make the best use of our unconventional gas resources. We want to see any growth potential realised, to create jobs and enhance our energy security while safeguarding the environment and public safety in the process. Failure to explore the potential of shale gas could result in UK gas prices being higher than they might otherwise be as large volumes of shale gas production in the UK could be expected to exert downward pressure on UK gas prices.

The question of whether recovery of UK shale resources is economically viable is ultimately one for industry. The Government is ensuring the right framework is in place to support industry and local areas as exploration and production moves forward if geology and economics prove favourable.

Global unconventional gas production would be a strongly positive development in terms of energy prices and security, but we cannot assume it will bring impacts comparable to those seen in US. Gas price forecasts produced by external analysts (eg the projections used by the IEA in the World Energy Outlook) point to continued high gas prices to 2030. The uncertainties on unconventional gas potential, combined with expectations of rising global gas demand (IEA estimates it will rise by 50% by 2035), lead most analysts to project global gas prices will remain around the current levels.

The Government agrees that policy decisions should not be based on the assumption that gas prices will fall. DECC policies are assessed using price assumptions which provide a range of projected gas prices reflecting the inherent uncertainty. Different possible outcomes are modelled; one in which prices are low, one in which prices are high and a central case. The 2012 Price Projections see increases from 2013 onwards in both the central and high cases. Only the low price case sees prices gradually fall and this relies on comparatively optimistic assumptions of plentiful global volumes of LNG and subdued European gas demand. Unconventional gas production is only one of a number of factors expected to affect gas markets over the coming years.

Cheaper gas prices in the UK, whatever the driver, would benefit consumers of both gas and electricity and particularly energy intensive users (eg steel and aluminium, chemicals, paper, lime glass and ceramics). Cheap and secure supplies of gas would provide additional benefit to the chemicals industry as hydrocarbons are widely used as feedstock for products such as fertilisers, plastics, dyestuffs and pharmaceuticals.

Shale gas has the potential to generate substantial tax revenues but this is largely dependent on a number of currently unknown factors (including the volume of economically recoverable reserves, the cost of recovery and prevailing gas prices). There is potential for domestic shale production to result in a decline in the UK's gas imports, dependent on the volumes.

Global emissions

13. We conclude that although development of shale gas in the US has reduced America's greenhouse emissions this may have been offset by increased use of the coal in Europe. This highlights the importance of improving the EU ETS to ensure it is able to deter the consumption of unabated coal for electricity generation. (Paragraph 68)

The Government agrees that the EU ETS needs to be strengthened and is pressing for urgent reform of the system to achieve a higher and more stable carbon price that will drive further investment in carbon abatement and low carbon technology, including for power generation.

We continue to support the European Commission's proposal to "back-load", or delay, the auctioning of allowances proposals, as a short-term, temporary measure pending more substantive structural reform of the EU ETS to address the surplus of allowances in the system and provide a robust carbon price in the longer term. We are actively engaging in EU level discussions on structural reform and have called on the European Commission to produce legislative proposals by the end of the year.

We believe that the EU ETS should continue to be a core component of both EU and UK climate change policy. We will be considering the full range of options for reform as we develop the Government's position on the future of the EU ETS with the aim of ensuring that it continues to be an effective instrument for keeping the EU on a reliably robust decarbonisation trajectory.

UK emissions

14. *We recommend that the Government should complete its research into the impact which shale gas extraction could have on greenhouse gas emissions as quickly as possible so that the data can be used when considering applications for licenses for commercial scale extraction. Policies on flaring and venting of methane should be reviewed in light of the study in order to ensure that fugitive emissions from fracking are kept as close to zero as possible. DECC should also monitor the methane emissions of those companies that are currently exploring for shale gas. It should be possible, by way of regulation, to ensure that fugitive emissions are prevented by outlawing venting.* (Paragraph 73)

The Secretary of State has asked DECC's Chief Scientific Adviser, and Dr Tim Stone, the Senior Advisor to the Secretary of State, to undertake a study into the possible impacts of shale gas extraction on greenhouse gas emissions. The study will consider the available evidence on the lifecycle greenhouse gas emissions from shale gas exploitation, and the need for further research. It will also consider the monitoring of methane emissions in shale gas exploration projects and the Government will also give weight to the Committee's

recommendation in deciding upon the way forward. The study will be published in the summer.

Venting and flaring are already regulated by DECC. For all oil and gas activities, DECC requires that venting should be kept to the minimum that is technically possible. Routine venting is never permitted but it is not possible to prohibit venting entirely, as in particular circumstances it may be necessary for safety reasons. The preferred alternative, where gas has to be released because there is no economic use for it, is that the gas should be flared to reduce its contribution to global warming emissions. For onshore oil and gas activity during the exploration phase, there is normally no economic use for any gas which may be produced as it is unlikely that relevant pipeline connections would exist at that stage and flaring would in those cases normally be permitted.

In respect of future appraisal or production activities, DECC's established policy is that flaring should be reduced to the economic minimum. DECC will therefore expect operators to use best practice at an early stage in the design of the development, to capture gas from the flowback fluids through "green completions" and to seek economic use for the captured gas at the earliest point feasible in the development. These aims are fully reflected in the best practice guidelines developed by UKOOG.

DECC and the Environment Agency are giving further consideration to the appropriate treatment of methane emissions within the framework of environmental permitting, and what further work is necessary to characterise residual emissions levels. Better information around the potential sources of emissions will inform policy on how best to minimise fugitive emissions, i.e. methane which is emitted not by specific actions by the operator (venting) but because of the design and operating characteristics of the pressure containment systems, pipelines and related equipment. Full account will be taken in this work of the latest research and other relevant information.

15. We conclude that the Government needs to recognise that the unchecked development of gas-fired generation, which the development of shale gas may facilitate, might be incompatible with meeting the UK's climate change obligations. ***As we have recommended before the Government should implement an emissions performance standard (EPS) that gets tighter over time so as to include unabated gasfired plant and avoid excessive gas "lock-in". However we do recognise there will be a role for unabated gas as peaking plant and to balance intermittent renewable sources. If shale gas does prove to be plentiful and either cheap or yielding substantial tax revenues it would be sensible to put far more emphasis on developing CCS.*** **(Paragraph 77)**

16. We share SSE's frustration at how long it is taking to develop CCS especially as it is clear that the Prime Minister sees it as critical to meeting our future climate change targets. The speed of commercial development of CCS will affect whether it can play a meaningful role in the UK's energy mix and how much gas we can rely on without conflicting with the UK's climate change targets. While we are pleased to hear in the Budget that the Government will take two CCS projects to the next stage of the CCS commercialisation competition, ***we recommend the Government needs to conclude its CCS competition as soon as possible and bring forward CCS demonstration projects to allow it to be deployed in time to contribute towards meeting our carbon budgets. Unless progress towards economically viable CCS accelerates rapidly in the next three years, it***

will become impossible to base UK energy policy on the assumption that it will be available in time to help meet the decarbonisation recommendations of the Committee on Climate Change. We intend to keep a close eye on DECC's progress in this area. **(Paragraph 81)**

Significant levels of investment will be needed in new gas capacity over the next decade to ensure security of supply as ageing coal, nuclear and gas capacity is retired.

Analysis for the Government's Gas Generation Strategy1 (GGS) shows that whilst we may need more gas capacity in 2030 than we have today (up to 5GW based on an average grid intensity of 100g/kwh), the role of gas will increasingly become one of balancing a system with increasing amounts of intermittent and inflexible low carbon generation (i.e. wind and nuclear).

The levels of gas generation will be determined by the market, while keeping emissions within the limits set by the Carbon Budgets. The GGS analysis shows that whilst individual gas plants with the highest efficiencies (i.e. those which are new or have undergone significant refurbishment) can be expected to operate at relatively high load factors, the overall generation from gas will steadily decrease as more low carbon capacity comes onto the system and is prioritised by the measures we are bringing forward under EMR. Analysis for the GGS shows the average overall load factor for gas plant at around 27% based on achieving average grid emissions of 100g/kWh in 2030.

The "grandfathering" of the Emissions Performance Standard (EPS) limit, under which a new plant is consented until end 2044, is consistent with the GGS analysis. Grandfathering removes the EPS regulatory risk that may deter or increase the cost of investment in new gas capacity by providing certainty about the regime under which a new plant will operate. However, it is not a "right to emit" up to the defined EPS limit and it will be economic factors that will determine the levels of gas generation.

Whilst setting the EPS on a declining trajectory could mark out a decarbonisation pathway and provide certainty on the amount of carbon emissions that individual plants could emit at a given point in time, without equal certainty about the scale and timing of investment in new low carbon capacity, it risks creating unintended consequences that are counter to our decarbonisation, security of supply and affordability objectives. For example, were the levels of low carbon generation lower than expected for the period covered by each tightening of the EPS limit, then the EPS could prevent energy demand being served in the most efficient way, as generation from the most efficient gas plant may be curtailed and replaced by less efficient plant. This could result in increased emissions and cost to the consumer. We have committed to review the EPS on a regular basis.

As the Committee have noted, the Government recently announced its two preferred bidders in the £1bn CCS Commercialisation Competition. These are large, complex, first of a kind projects and we have been working at pace to progress the competition.

The detailed process we have gone through has brought much value, both in terms of gaining stronger assurances that the projects we proceed with will be both deliverable and financeable, but also that they could ultimately provide good value for the UK taxpayer.

[1] https://www.gov.uk/government/publications/gas-generation-strategy

The next stage is for projects to enter into multi-million pound Front End Engineering Design (FEED) contracts in the summer. These studies are a fundamental part of any large engineering or construction project prior to final investment decisions - it is only through this detailed work that all parties can gain greater certainty regarding the costs involved. The results of the FEED studies will then inform decisions, in early 2015, on constructing up to 2 full projects. We expect the projects to be operational between 2016 and 2020.

17. ***We recommend the Government push through its reforms to the electricity market, as set out in the Energy Bill, without delay. This will discourage the unchecked development of unabated gas-fired generation and create a favourable investment climate for low carbon technologies which could help to avoid gas "lock-in".*** **(Paragraph 86)**

The Government agrees with the recommendation to proceed with EMR delivery without delay and that this will serve to align incentives for developers across low and high carbon generation. This is why, on 27th June, the Government announced, among other detail on the EMR mechanisms, that the first capacity market auction will run in 2014 for delivery of capacity from winter 2018/19, subject to state aid clearance.

We question the validity on the point on avoiding gas "lock-in" as gas-fired generation receives no guarantee of dispatch. Evidence for this is provided the current limited operation of such plant due to high gas prices which has meant that it is less efficient to use than plant with lower operating costs. While the capacity market will provide incentives for reliable capacity (including gas-fired generation) to deliver energy when needed (such as during periods of peak demand), prices in the electricity market will still determine the merit order for plant dispatch. This means that low carbon generation, which typically has lower operating costs than gas-fired generation, will tend to operate more frequently than gas in the future.

Security of supply

18. ***We recommend that Government should not rely on shale gas contributing to the UK's energy system when making strategic plans for energy security. We welcome the commitment made by the Minister that the new Office for Unconventional Oil and Gas will assess the effects of shale gas development on the UK's security of supply – providing we can be reassured that that the Office does not have a conflict of interest.*** **(Paragraph 90)**

Shale gas activity in the UK is very much in its infancy and it is far too early to make any useful assessment on the impact of domestic shale gas production on UK energy security. DECC will continue to monitor the potential effect of shale gas on the UK's security of energy supply.

However, the Government is clear that if significant resource could be developed in a safe and environmentally sustainable way, this would bring benefits to the UK in terms of jobs and energy security. The Government is therefore committed to enable the exploration of UK shale gas in a safe and environmentally sustainable way to establish its potential. The Government's position on potential conflicts of interest for OUGO is set out in the response to Recommendation 7 above.

Economic benefits

19. ***We recommend that Government encourage partnerships such as the one between Cuadrilla and the University of Central Lancashire to ensure the skills required to develop the shale gas industry are available. Government should make an assessment of the need for skills development and should work with industry and the relevant sector skills council to develop a skills action plan for shale gas similar to the Nuclear Supply Chain Action Plan which the Government has recently published.*** **(Paragraph 93)**

One of the potential benefits of the production of shale gas is job creation. As part of the Government's Growth Strategy, DECC will work with BIS to assess the need for skills development. Building partnerships to encourage job creation and growth is part of the work being led by BIS. In order to improve the responsiveness of the skills system to the needs of business, BIS is promoting much greater employer leadership and closer collaboration between business and higher education and further education colleges. We hope that other companies and institutions will follow the lead of Cuadrilla and the University of Central Lancashire.

A number of industry led bodies provide an assessment of skills needs in the energy sector including sector skills councils (Energy and Utility Skills and Cogent) and OPITO. The UK Commission for Employment and Skills has also conducted work to understand the skills needs and challenges of key areas of the UK economy, including the energy sector, and will continue to do so.

The Oil and Gas sector strategy has identified how the sector and the Government can work on the skills challenges the offshore sector faces, and that links could be made with opportunities in future sectors including shale gas. There is also supply chain mapping being commissioned. A supply chain action plan, along the lines of the nuclear industry, may be the way forward once we have confirmed our current understanding of the skills challenges in this part of the energy sector.