



House of Commons
Welsh Affairs Committee

The future of nuclear power in Wales

Second Report of Session 2016–17



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*Report, together with formal minutes relating
to the report*

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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.)

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Committee reports are published on the Committee's website at www.parliament.uk/welshcom and in print by Order of the House.

Evidence relating to this report is published on the [inquiry publications page](#) of the Committee's website.

Committee staff

The current staff of the Committee are John-Paul Flaherty (Clerk), Elin James Jones (Committee Specialist), Shane Murray (Senior Committee Assistant), Dominic Stockbridge (Committee Support Assistant), and George Perry (Media Officer).

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Summary

Nuclear power has a long history in Wales, supplying power to large parts of the nation and providing thousands of people with well-paying jobs. As part of its new nuclear strategy, the UK Government is planning to approve a deal to build Wylfa Newydd in Anglesey—a plant which will provide power to 5 million homes. The plant would also provide a major economic boost to Anglesey and the wider region of North Wales. The Wylfa Newydd project will create thousands of jobs, but it is important to ensure that a significant share of these jobs go to people in North Wales. Training programmes for individuals and businesses will be necessary for this to happen. Therefore, we were surprised to learn there are no plans to create a North Wales campus for the National Nuclear College, which will be key in developing nuclear skills in the UK.

The decision to build new nuclear power plants in the UK is not without controversy. The 2011 Fukushima accident brought the safety of nuclear power under scrutiny once again. At the same time, the high strike price agreed for Hinkley Point C has raised questions of whether nuclear power meets the Government's criteria for energy in terms of providing value for money, while ensuring security of supply and reducing carbon emissions. We believe that Wylfa Newydd can deliver value for money and deliver a significant portion of the country's future energy needs. To achieve this, the developers and the Government will need to manage potential delays and bottlenecks, to keep costs down and the project on schedule.

As well as the construction of new power plants, two existing power plants require decommissioning. In terms of Trawsfynydd, progress on decommissioning has demonstrated how it can take place quickly, efficiently, and safely. However, under the current plans, Trawsfynydd will lose most of its jobs within the next ten years. We were told there is a realistic plan for continuous decommissioning that could keep more jobs on site. Due to the major benefits this will bring to the local area, we recommend that the Nuclear Decommissioning Authority implement this alternative plan for decommissioning. For Wylfa A, the process for decommissioning will be simpler and quicker, which should allow the site to be ready for the construction of Wylfa Newydd.

The UK must also deal with the stockpiles of nuclear waste produced by existing nuclear reactors and make plans to dispose of waste from new plants in the future. While waste is currently stored safely on nuclear sites in Wales, a permanent solution is needed. We therefore recommend that the Government accelerate progress on finding a location for a geological disposal facility, which will reassure the public that nuclear waste is being dealt with appropriately.

The Government has also announced its ambition to be a top tier nuclear nation, leading in research and development. As part of this policy, it wishes to see the development of small modular reactors in the UK. Small modular reactors are so far unproven, but they remain an option worth exploring. The Government should support their development by creating the appropriate regulatory and business environment in which they can succeed. Furthermore, if small modular reactors are developed, Trawsfynydd in North Wales would be an ideal location for a first-of-its-kind model.

1 Introduction

1. Wales has played a key part in establishing the nuclear industry in the UK, having hosted two first generation nuclear reactors for the past half a century. However, the future for nuclear power in Wales is uncertain. Both the below power stations are now closed, and therefore Wales no longer has any operational nuclear power plants.

- **Wylfa A:** Until 2015 this was the oldest nuclear power station in operation in the UK. The reactor was built in 1963 and began operating in 1971. It had two 490MW¹ reactors, providing around 15% of Wales' energy production, and producing 232TWh of electricity over its lifespan. Due to close in 2010, its operational life was extended as a result of transferring partially-used fuel from one reactor to the other through the innovative Inter-Reactor Fuel Transfer process. This extended life provided an extra £1bn in revenue, which has been used for decommissioning and clear-up.
- **Trawsfynydd:** This power station was commissioned in 1959 and began operating in 1965. Trawsfynydd is unusual in that it is the only inland nuclear power station in the UK, accessing cooling water from the Llyn Trawsfynydd reservoir. There were two 230MW reactors at Trawsfynydd, which generated 69TWh over their 26 year lifespan. Both reactors shut down in 1991 for a routine outage and closed permanently in 1993. The site is currently undergoing preparations for the care and maintenance phase of decommissioning.

The UK Government's policy on nuclear power

2. The UK Government's policy is to encourage new nuclear power stations to be built, to replace the existing ageing nuclear power stations. A number of the ageing power stations (including Wylfa A) have had their operating life extended, but the majority are due to close over the next decade, while no new nuclear capacity is due to come online before 2020. Meanwhile, the share of electricity produced by nuclear power has fallen from a high of 25% in the 1990s to below 20% and the amount has also fallen.² This is in contrast to most countries with nuclear power stations, where output increased between 1990 and 2012.³

3. The UK Government set out its policy in its March 2013 publications *Long Term Nuclear Energy Strategy*⁴ and *The UK's Nuclear Future*⁵. In the latter, the Government proposed the construction of 12 new reactors at five sites, producing 16GW annually. The Government aims to improve decommissioning, and to sustain and improve the nuclear skills base. Furthermore, it intends to build an integrated nuclear industry through a nuclear industry strategy. The strategy includes the goal of using research and development, so that the UK becomes a 'top-table' nuclear nation through innovating

1 Megawatts. See Annex for further information.

2 *Nuclear energy statistics*, Standard Note [SN/SG/3631](#), House of Commons Library, September 2013

3 *Nuclear energy statistics*, Standard Note [SN/SG/3631](#), House of Commons Library, September 2013

4 Department for Energy and Climate Change, [Long-term Nuclear Energy Strategy](#), 2013

5 Department for Business, Innovation and Skills, [The UK's Nuclear Future](#), 2013

in nuclear design. The Secretary of State for Energy and Climate Change reiterated these goals when announcing the Government's "New Direction for Energy Policy" in November 2015.⁶

4. The Government's *Long-Term Nuclear Energy Strategy* notes a number of factors to support the case for building new nuclear power stations. As nuclear power is low-carbon, it would support the UK's objective of meeting its emissions targets, in conjunction with electricity production from renewables. Nuclear power could also provide energy security at a time when the UK capacity margin (the average amount of extra electricity available compared to peak winter demand) is shrinking and the energy supply is becoming more dependent on gas, as existing nuclear plants have yet to be replaced. Benefits can also be gained through developing the nuclear industry and a nuclear supply chain. Furthermore, it has been argued that the lifetime cost for nuclear power would be lower than all other new power stations, although these costs have been disputed due to the history of nuclear power's reliance on government support.⁷ In the previous Parliament, the Energy and Climate Change Committee took the view that without new nuclear plants "it will be extremely difficult to meet our low-carbon obligations", but the Government's plan to build 16GW by 2025 was described as "ambitious" at best and "unrealistic" at worst.⁸

5. As part of the Government's plans for new nuclear build, it is proposed that two new Advanced Boiling Water Reactors (ABWRs) are built by Horizon Nuclear Power, a subsidiary of Hitachi, at the Wylfa site. Hitachi-GE, which develops and builds nuclear reactors, will provide the ABWRs for Wylfa Newydd. The Wylfa Newydd plant (also referred to as Wylfa B) will have a minimum output of 2,700MW, which is considerably higher than the peak output at Wylfa A.

6. The UK Government is also interested in developing small modular reactors (SMRs), a new type of nuclear reactor that is believed to be more flexible and cost effective than traditional nuclear reactors. SMRs are not yet an operational technology, and will not be built in the UK for several years. The Government's goal is to build an SMR in the 2020s, and there is an ongoing competition to identify the best value SMR design. Funding has also been made available for research and to develop an SMR roadmap.

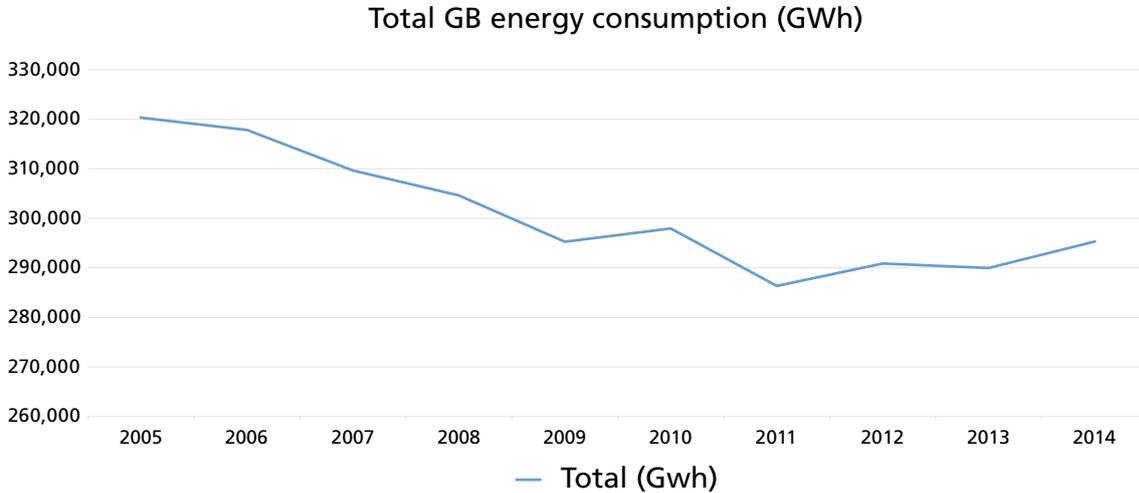
6 Department of Energy and Climate Change, '[Amber Rudd's speech on a new direction for UK energy policy](#)' accessed 22 June 2016

7 *Nuclear power*, Standard Note [SN06228](#), House of Commons Library, October 2013

8 Energy and Climate Change Committee, Sixth Report of Session 2012–13, [Building New Nuclear: the challenges ahead](#), HC 117

The UK's current energy mix

7. Energy consumption in Great Britain fell between 2005 and 2014 by 8%, as shown by the chart below.⁹ Wales showed a similar trend through this period.



8. There has been concern about the UK's capacity margin and supply of electricity in the coming years.¹⁰ This is partly due to the closure of nuclear power stations, coal-burning plants, and the mothballing of gas plants due to low profitability.¹¹ Between 2010 and 2014, 22 plants were closed, partially closed, or mothballed—two of these were nuclear plants. At the same time, renewable sources, although they off-set the supply losses, are not sufficiently developed to make up the gap and some, such as solar and wind, cannot provide a consistent supply.

9. Energy statistics for the third quarter of 2015 showed that overall electricity supply had fallen.¹² In addition, the capacity margin, which was above 10% from 2009–12,¹³ had fallen, and in July 2015, Ofgem reported uncertainty of supply for winter 2015–16.¹⁴ When there is insufficient energy supply, National Grid takes action to purchase spare capacity to balance the system, and without doing so in winter 2015–16, the margins would have been much tighter.¹⁵

10. As well as supply having fallen, it is possible that the UK's energy mix will become less diverse and be over-dependent on one or two energy sources (particularly gas-fired stations) for regular supply. The share of energy from nuclear fell from 19.4% in 2004 to 17.2% in 2014, whilst the share from gas rose from 27% to 30%.¹⁶ Since then the amount of electricity produced by nuclear energy has fallen further to the closure of Wylfa A.¹⁷

9 Department for Energy and Climate Change, [Sub-national electricity and gas consumption statistics](#), 22 December 2015

10 ["Ofgem warns of blackouts as it predicts grid's spare capacity could fall to zero"](#), The Guardian, 17 July 2015

11 Department for Energy and Climate Change and National Statistics, [Digest of United Kingdom energy statistics 2015](#)

12 ["UK Energy Statistics, Q3 2015"](#), Department for Energy and Climate Change and National Statistics Statistical press release, 22 December 2015

13 ["Electricity blackouts risk up, says National Grid"](#), BBC News, 15 July 2015

14 Ofgem, [Electricity security of supply: A commentary on National Grid's Future Energy Scenarios for the next three winters](#), July 2015

15 Ofgem, [Electricity Capacity Assessment Report 2014](#), June 2014

16 Department for Energy and Climate Change and National Statistics, [Digest of UK Energy Statistics](#)

17 Department for Energy and Climate Change and National Statistics, [Energy Trends June 2016](#), 30 June 2016

Our inquiry

11. We launched our inquiry into the future of nuclear power in Wales on 20 January 2016,¹⁸ inviting evidence on the following topics:

- Whether Wylfa Newydd will be built on schedule;
- What the cost of Wylfa Newydd will be and whether it represents value for money;
- What the strike price (the guaranteed price per kilowatt hour for electricity for the owners of Wylfa Newydd) from Wylfa Newydd is likely to be and what impact it will have on energy prices in Wales;
- What impact will Wylfa Newydd have on the economy of Anglesey and Wales;
- What the environmental impact of Wylfa Newydd will be;
- How the decommissioning of Wylfa and Trawsfynydd is being carried out;
- What the economic impact of the decommissioning of Trawsfynydd will be;
- What potential there is for small modular reactors to be built at Trawsfynydd and how that will impact decommissioning and future planning; and
- Whether the Welsh Government and UK Government are co-ordinating their policy in this area.

12. During the course of the inquiry, we held six oral evidence sessions, hearing from 33 witnesses. Five sessions took place at Westminster, with the first of these being partly conducted in Welsh with simultaneous translation. We also held an evidence session at Gwynedd County Council, Caernarfon to hear from local groups in North Wales. This session was also conducted in Welsh. We recognise the importance of being able to receive evidence in either Welsh or English. Furthermore, we recognise the value of holding evidence sessions near to communities affected by the subject of our inquiries.

13. We also visited the two main nuclear sites in Wales, Wylfa and Trawsfynydd, where we learnt about the history of the old nuclear plants at both sites, the process of decommissioning, and the plans for the future. We are grateful to the Nuclear Decommissioning Authority, Magnox Ltd., and Horizon Nuclear Power for making these informative visits possible.

14. On the basis of the evidence received, we have decided to focus our findings on the following issues, as set out in each chapter:

- Wylfa Newydd: Cost and scheduling;
- Wylfa Newydd: Environmental impact and safety;
- The contribution of the nuclear industry to the economy of North Wales;
- Decommissioning and waste at Trawsfynydd and Wylfa A; and
- Small Modular Reactors (SMRs).

¹⁸ Welsh Affairs Committee, [The future of nuclear power in Wales inquiry](#)

2 Wylfa Newydd: Cost and scheduling

The cost of new nuclear and Wylfa Newydd

15. The UK’s energy strategy aims to balance energy security, environmental costs, and the price of energy. The Government believes that nuclear power provides a cost-effective source of energy while reducing carbon emissions, and providing a secure and stable source of energy. Andrea Leadsom MP, Minister of State, Department of Energy and Climate Change, told us:

“we are trying to meet our energy trilemma at all times, which is to keep the lights on—which is absolutely non-negotiable—to keep the bills down and to decarbonise at the lowest price. Of course, nuclear meets all of those requirements. Essentially, it is a low-carbon source of electricity. It is dispatchable—it is reliable, it has fewer additional costs for backup and so on. We believe it is also affordable”¹⁹

16. There are two main cost factors to consider in relation to nuclear power. The first is the strike price—the price at which the Government agrees to buy electricity from the supplier. The strike price agreed for Hinkley Point C was £92.50/MWh, approximately double the current wholesale cost of electricity.²⁰ The Minister said in follow up evidence that wholesale prices only make up 40% of household electricity bills and that wholesale prices are quite volatile, while the strike price will keep nuclear costs stable.²¹

17. The Hinkley Point C strike price is lower than the strike price for some renewable energy sources, such as offshore wind, but Dr Doug Parr, Chief Scientist, Greenpeace UK, noted that:

“the cap prices for offshore wind into the future...would make offshore wind cheaper than nuclear by the time...Hinkley opened.”²²

Some pro-nuclear groups have also said that the strike price of Hinkley Point C is too high.²³ As a result, New Nuclear Watch Europe told us the Wylfa Newydd project should not be contemplated unless the strike price is below that of Hinkley Point C. They argue the benchmark should be set by other projects, such as Korean-built reactors in the UAE, and the UK should aim for a strike price of £83/MWh.²⁴ Horizon Nuclear Power, the Wylfa Newydd developers, recognised the concern over the strike price and told us “we are acutely aware of the importance of affordability and delivering value for money”.²⁵

18. The second cost factor relates to construction and financing costs, and cost overruns. Nuclear is capital-intensive compared to other power sources, and the upfront cost of

19 Q279

20 Q280–283

21 Department for Energy and Climate Change - supplementary ([FNP86](#))

22 Q79

23 See Supporters of Nuclear Energy ([FNP25](#)), New Nuclear Watch ([FNP45](#)), and “[We are pro-nuclear, but Hinkley C must be scrapped](#)”, The Guardian, 18 September 2015

24 New Nuclear Watch ([FNP45](#))

25 Q4

new nuclear build will be expensive. The construction of a major infrastructure project requires a large amount of capital and the uncertainty around large projects can also make the financing costs more expensive.

19. The high cost, uncertainty and delays around the Hinkley Point C project have led some to call into question the Government's whole nuclear power strategy. However, Alan Raymant, Chief Operating Officer, Horizon Nuclear Power, told us that whilst Hinkley Point C was "an important bellwether for the nuclear new build programme as a whole" Wylfa Newydd would not be dependent on that project succeeding.²⁶ That said, it is clear that the experience of Hinkley Point C will inform future decisions on nuclear power. In particular, it means that the potential cost of Wylfa Newydd should be carefully considered before the Government gives it the green light.

20. More generally, some witnesses argued that the Government does not compare the costs of energy sources fairly. Dr Parr, Greenpeace UK, told us "it feels like at the moment is that certain forms of generation, particularly gas and nuclear, are getting preferential treatment",²⁷ whilst Gerry Wolff, Co-ordinator, Energy Fair, said that there were a number of hidden costs and subsidies involved with nuclear power. He argued that the fact that nuclear power still received subsidies despite being a mature technology showed that it was not economically practical in comparison to renewable sources.²⁸

21. The Minister told us that she was trying to make energy pricing more transparent and easier to understand, but emphasised that all of the costs of nuclear power are taken into account. She said that there were hidden costs for all forms of energy generation, which DECC is trying to make clearer.²⁹ The Minister also noted that the 10% discount rate for levelised cost estimates of nuclear power was the same as for all energy technologies.³⁰ Moreover, she stated that the developers would bear the risk for any agreement on Wylfa Newydd and would be required to absorb all of the costs, a position that Horizon Nuclear Power concurred with.³¹ Andrea Leadsom also reiterated that nuclear power offered good value for money when viewed over a longer time horizon, because it would both guarantee a long-term source of base-load energy and would also guard against future energy price rises.³²

22. We received conflicting evidence on the potential cost of new nuclear build and Wylfa Newydd in particular. Whilst nuclear power may not be the cheapest source of energy available, it does have the added benefit of providing value for money for a secure and reliable source of low-carbon power. We are also reassured that the taxpayer will be protected from excessive costs, as the risk of the investment is placed on the developer.

23. *The UK Government is in favour of new nuclear build, but not at any price. Energy policy should balance cost against energy security and environmental concerns. We recommend that the Government negotiate a strike price for Wylfa Newydd below that*

26 Q1

27 Q77

28 Q174

29 Q287

30 Department for Energy and Climate Change - supplementary ([FNP86](#))

31 Q5 and Q11

32 Q279–280

agreed for Hinkley Point C and seek a price that would be competitive with renewable sources, such as on-shore wind. The Government should not continue with the project if the price is too high.

24. *We were told by witnesses that some of the costs of nuclear power are hidden. When we questioned the Minister, she said that this was not especially the case for nuclear power, but it was the case for all energy sources. As a result, energy pricing is often difficult to understand and can seem opaque to experts, let alone the general public. Without access to all the necessary information it is difficult to compare and to critique decisions that have been taken. We recommend that the Government provide a clear and comprehensible explanation of how the lifetime cost of energy sources are compared. In particular, it should show how it compares new nuclear with renewable alternatives. The Government should also be transparent about all the costs related to new nuclear build, including the eventual cost of decommissioning and waste disposal.*

The track record of the Advanced Boiling Water Reactor

25. An important element for determining the cost of energy projects is the load factor. This measures how much energy a plant can generate in practice, as a percentage of the maximum energy it could theoretically generate. No plant will have a load factor of 100%, because they need to be shut down periodically for maintenance and safety reasons. The load factor of nuclear power plants can vary, and some do not achieve a high load factor due to poor design or the need for repeated maintenance. If the load factor is lower, it will increase the cost per megawatt hour, as the plant will stand idle for longer and produce less energy.

26. Horizon Nuclear Power said that a major selling point for Wylfa Newydd is their use of the Advanced Boiling Water Reactor (ABWR). Alan Raymant, their Chief Operating Officer, told us this is the most reliable modern reactor and that this was an opportunity to bring the technology to the UK. He added “[this] is the only proven latest generation technology that has been built and been in operation, so we are building on a successful track record in Japan.”³³ Based on the performance of the ABWR in Japan, Horizon Nuclear Power believe they can achieve a load factor of 85%–90% in the UK.³⁴ Greg Evans, Operations Director, Horizon Nuclear Power said this figure informed Horizon Nuclear Power’s financial plans:

“the [ABWR] has quite a brilliant operating record...The 85% to 90%...is an investment assumption. That obviously takes in worst-case and best-case scenarios and then averages them out. As operators we are confident that we can...achieve upwards of 90% availability.”³⁵

27. However, some witnesses questioned this figure, suggesting that the ABWRs in Japan have had lower load factors than those predicted for Wylfa Newydd. Professor Gordon MacKerron and Dr Philip Johnstone said that technical issues caused a shutdown of the reactors in 2008,³⁶ while Greenpeace said that the load factor has been lower than 50% in the period between 2007 and 2011.³⁷ Dr Doug Parr, Greenpeace, told us:

33 Q6

34 Horizon Nuclear Power ([FNP34](#))

35 Q10

36 Professor Gordon MacKerron and Dr Phil Johnstone ([FNP65](#))

37 Greenpeace UK ([FNP68](#))

“the best thing to do would be to look at the actual existing performance of those reactors, and...they do not approach a 90% or even 80% load factor. ... That is where I would look for evidence because saying it is going to deliver 90% load factor is an assertion. The actual evidence of existing performance says it is rather less than that.”³⁸

28. Professor Andrew Sherry, Chief Scientist, National Nuclear Laboratory, said these figures could be explained, in part, because the reactors had not had long operational lives. Therefore, one bad year would have a large impact on the overall load factor. The evidence shows that the performance of the four ABWR reactors has fluctuated during their deployment, with annual load factors ranging from close to 100% down to zero.³⁹ In Japan, the cumulative load factors for the first ten years of operation (1997-2006) for the two older reactors were 84.7% and 76.3%. Between 2007 and 2010, the reactors did not operate as well, but the Nuclear Industry Association (NIA) explained this was “for various reasons that are not expected to arise in the UK”,⁴⁰ such as the reactors being shut down for earthquakes and the deployment of new turbines. Despite this, their cumulative baseload was still 72.8% and 68.2% by 2011. The new turbines, which corrected a flaw, are now part of the new design for the ABWR at Wylfa Newydd, and the different operating conditions in the UK mean that the load factor for a similar reactor in the UK is expected to be higher. Therefore, Professor Sherry told us that, taking these factors into account, it was possible to reach a load factor of 90% in some years and a lower figure in other years.⁴¹

29. We received conflicting reports on the track record in Japan of the Advanced Boiling Water Reactor that will be used at Wylfa Newydd. We received evidence to explain why lower than expected levels of output were seen in Japan, but it seems likely to us that Horizon Nuclear Power will be able to achieve a load factor similar to its commercial assumptions in the different operating conditions in the UK.

Potential delays and their impact on cost and Government policy

30. Nuclear power projects have often suffered from significant delays, which can lead to cost overruns. A number of witnesses suggested that Wylfa Newydd could suffer from major delays that would drive up costs and would prevent it from being completed on schedule.⁴² Witnesses referred to the delays to Hinkley Point C (which was originally due to begin operation in 2017), and also pointed to the fact that the Flamanville reactor in France has almost tripled in cost, and the Olkiluoto 3 reactor in Finland is €5bn over budget due to delays⁴³.

31. Professor Gordon MacKerron told us that Horizon Nuclear Power’s goal of beginning operation in the first half of the 2020s was optimistic for a number of reasons. He said:

38 Q72

39 World Nuclear Association, Reactor database, [Kashiwazaki Kariwa 6](#), [Kashiwazaki Kariwa 7](#), [Shika 2](#), [Hamaoka 5](#), accessed 22 June 2016

40 Nuclear Industry Association, [Justification Application: UK ABWR Nuclear Reactor](#), February 2014

41 Q267–268

42 Friends of the Earth Cymru ([FNP54](#)), Greenpeace UK ([FNP68](#))

43 “[Tale of woe in French nuclear sector](#)”, Financial Times, 13 October 2015

“first of all, we do not have experience in the UK of building reactors quite at that speed even if everything else goes well. There are still licensing issues yet to be resolved. There are financing issues yet to be resolved. Horizon Nuclear Power has said publicly they still need to find extra finance.”⁴⁴

32. A further issue that could cause delays for Wylfa Newydd is the labour supply. Wylfa Newydd will require a large number of skilled workers, and Horizon Nuclear Power will be competing against Hinkley Point C for those workers, to the extent that it has been suggested that the UK may not have enough workers to supply the projects. In addition, Dr Philip Johnstone told us that there could be competition between the civil and defence sectors for these workers, as the construction of reactors for nuclear propulsion and the maintenance of UK submarine infrastructure is also scheduled to take place at the same time.⁴⁵

33. Furthermore, other non-nuclear infrastructure projects (such as HS2 and Crossrail) would also be competing with Wylfa Newydd for labour. Professor MacKerron asserted that a potential labour supply bottleneck could cause delays or increased costs. He said:

“It is difficult to know exactly how that may be mitigated. It may be possible to bring into the UK people from elsewhere who have relevant experience. ... Short-term mitigation is difficult; it takes a while to train people up.”⁴⁶

34. Horizon Nuclear Power told us they were acutely aware of potential competition for workers with other infrastructure projects.⁴⁷ Horizon Nuclear Power also emphasised the successful record of building ABWRs to time and on budget in Japan. Alan Raymant told us that whilst this might not carry over perfectly to the UK, Hitachi had experience in managing large projects and would make the necessary adjustments to reduce the risks. He said,

“We are doing a lot of work to establish how to transfer that expertise to the UK...so Hitachi is already working closely with a number of UK suppliers to enable that to happen”⁴⁸

and that

“A lot of the work we are doing between now and starting the project for real is [making] sure we do have a robust supply chain, the companies understand the quality requirements, the engineering of the project is well advanced and that we have a very robust schedule and work programme to make sure the project is delivered on time.”⁴⁹

Furthermore, they were seeking a wide range of investors in order to ensure that financing would be secured.⁵⁰

35. The Minister told us that the Department for Energy and Climate Change (DECC) is in contact with the developer to help them stay on schedule, and that the Government

44 Q100

45 Q105

46 Q104

47 Q37

48 Q15

49 Q6

50 Q5

had no reason to think that Horizon Nuclear Power would not meet their deadlines.⁵¹ However, she emphasised that the Wylfa project alone was not critical to the security of the energy supply:

“should one new nuclear project not get taken forward, it would not be the case that, therefore, our energy security would be at risk. That is not the intention. ...the diverse range of sources will ensure that that is not the case and our capacity market that buys forward electricity supply makes sure that the lights will not go out.”⁵²

36. While the evidence we received from a number of witnesses, including Horizon Nuclear Power, show that they are trying to minimise the possibility of delays, recent experience suggests it shouldn't be assumed the Wylfa Newydd project will stay on schedule. We have heard that nuclear power projects have a history of cost and schedule overruns and, while the ABWR has a better construction record than most, it is unlikely to be wholly immune to this. Moreover, there are a number of specific factors that could cause delays and rising costs at Wylfa Newydd. These include the lack of experience in building an ABWR in the UK and a potential labour bottleneck for large infrastructure and nuclear projects. Horizon Nuclear Power should be planning to mitigate potential delays, and the Government should work with them to find solutions to these potential obstacles.

37. New nuclear build is a major part of the Government's plans for the UK's future energy supply. Wylfa Newydd is scheduled to begin operation when Britain's remaining nuclear power stations close in 2025. Although the Government told us that it is committed to a mix of energy sources, Wylfa Newydd is set to provide electricity to 5 million homes. It would be difficult to replace this provision. We recommend that the UK Government devises a contingency plan for a delayed start to the Wylfa Newydd project. It will be essential to have a back-up plan to fill the gap in the energy supply in the case that Wylfa Newydd is delayed.

51 Q288

52 Q289

3 Wylfa Newydd: Environmental impact and safety

The potential impact on Anglesey from construction and preparatory works

38. As a large infrastructure project, the construction of Wylfa Newydd will have an impact on the local environment and community in Anglesey. Local residents told us they were worried about the potential impact of construction in terms of environmental damage, including sound and visual pollution, the impact of traffic to and from the site, the need for workers' accommodation and consequent pressure on the housing market, the impact of an increase in population on services in the area, and the impact on the area's status as a Welsh-speaking region.⁵³

39. Isle of Anglesey County Council told us it supported the project but wanted to ensure that Horizon Nuclear Power took the community's concerns into account. They said:

“The support of the host community, the Island of Anglesey, is not... unconditional, and is dependent upon collaboration, respect, and recognition that significant lasting benefits are created and adverse impacts mitigated”⁵⁴

40. Alan Raymant appreciated that the construction of Wylfa Newydd would have a major impact and that Horizon Nuclear Power would try to help the community adjust:

“when we get right down into the immediate impact on the community, from things like our increased traffic flows, workers' accommodation, and so on, then we look at how we can improve the infrastructure to support that, and then also what benefits we can provide the community to mitigate the impact that they suffer, particularly during the construction phase. We make no secret of the fact this is a massive development and it will have a huge impact on a relatively small community.”⁵⁵

41. We were therefore reassured when Isle of Anglesey County Council told us they are already working with Horizon Nuclear Power to help plan for the project. Planning permission has been given for temporary accommodation for 3,500 workers, and a planning application had been submitted for the A5025 road to be improved to handle increased traffic flow.⁵⁶ In terms of the power plant, Horizon Nuclear Power has applied for planning permission to Natural Resources Wales and the Environment Agency, with a public consultation to be launched at the end of the year. Ieuan Williams, Leader, Isle of Anglesey County Council, told us they “co-operate closely” with Horizon Nuclear Power and had the resources needed to plan for the Wylfa Newydd project.⁵⁷

42. The enabling works for the plant include flattening two hills, with the resultant 10 million cubic metres of earth being moved to shield the nuclear site from view. Other enabling works include building breakwaters to enable equipment to be brought in by sea

53 Q161

54 Isle of Anglesey County Council ([FNP50](#))

55 Q32

56 Q159

57 Q155

and work to enable a 200 metre tall Ibis crane to be positioned on site. Following on from the enabling works, there will be major construction works for an extended period of time. Dr Gwynne Jones, Isle of Anglesey County Council, described the impact:

“At the moment, there is discussion about the effect of moving earthworks on the site, the construction work that could happen for 24 hours a day, seven days a week. You can imagine that there will be noise and an effect on the environment around that work. There is also the movement of materials needed for the work. One can foresee much movement of lorries. There will therefore be a significant impact on the environment during the construction period.”⁵⁸

43. The National Trust voiced a number of environmental concerns connected with construction of Wylfa Newydd. The National Trust own Cemlyn Bay, which is adjacent to the Wylfa site and is both a Site of Special Scientific Interest and a Special Protection Area. They are concerned about the impact of construction on local wildlife, the natural landscape, water quality, the habitat, and on a local tern colony. In particular, the National Trust say that breakwaters and marine off-loading facilities built to facilitate moving equipment by sea could alter natural processes such as sediment transport.⁵⁹ The North Wales Wildlife Trust, which manages the nearby Cemlyn Nature Reserve, made similar points in their evidence about the threat to local wildlife and locally important habitats. They state, “there is still sufficient and substantive doubt over the impacts of the scheme and the ability to provide for suitable mitigation” and that more clarity from Horizon Nuclear Power is necessary.⁶⁰

44. The Minister somewhat assuaged these concerns when she described the various approvals that were required:

“The environmental impacts will be a key consideration in deciding whether development consent can be given for a project and there will always be lots of conditions and provisions to make sure that the decision is based on robust environmental information”⁶¹

45. Isle of Anglesey County Council also expressed concern that in the longer term the project could affect the island’s other important economic sectors. Ieuan Williams Leader, Isle of Anglesey County Council, told us that tourism was the third largest sector of the island’s economy, after nuclear power and the public sector, bringing in £254m each year. It would be important to protect the tourism industry by protecting the landscape of Anglesey and part of this would be to avoid erecting pylons between Wylfa and the mainland. He suggested “Our preferred solution would be [for cables] to go underground from Wylfa to Pentir”.⁶²

46. Furthermore, Isle of Anglesey County Council are concerned about the long-term status of the island as a Welsh-speaking area. Other witnesses also said that the identity of the area as a Welsh-speaking region could be threatened by a large influx of workers from

58 Q161

59 National Trust ([FNP05](#))

60 North Wales Wildlife Trust ([FNP67](#))

61 Q295

62 Q158

outside the area.⁶³ Dr Gwynne Jones, Chief Executive, Isle of Anglesey County Council told us they would work with Horizon Nuclear Power to protect Welsh culture and the Welsh language:

“Such numbers of workers are a challenge to ensure that we protect the language, communities and culture. We are again discussing mitigation measures carefully with the developer. As the Council Leader said, one way of doing that is through giving permission for more than 2,000 beds in Holyhead. Keeping those workers together goes some way towards to mitigating the effects on the language.”⁶⁴

We also heard from witnesses who thought that the project would be good for the Welsh language. Dyfed Wyn Edwards, Leader, Gwynedd County Council, said his experience was that most workers at Trawsfynydd had been Welsh speakers and that good jobs were required to keep young Welsh-speaking people in the area.⁶⁵

47. As a major infrastructure project, Wylfa Newydd will have a significant impact locally. A number of concerns have been raised by local stakeholders, including local authorities, in relation to the local environment. Horizon Nuclear Power will have to address these concerns, to mitigate the impact of construction and retain the goodwill of the local community. Additionally, there are concerns about the impact of the project on the region’s status as a Welsh language area. An influx of workers from outside the area could reduce the proportion of Welsh speakers. However, as the local authorities pointed out, without jobs, Welsh speakers will leave the area.

48. The impact on the local environment needs to be minimised as much as possible if Wylfa Newydd goes ahead. This should include work to minimise the impact of construction work, for example from increased traffic to the site and from temporary workers’ accommodation. Horizon Nuclear Power should work proactively with the local authorities, local stakeholders such as the National Trust, and the local community to take mitigating actions to minimise impacts, and to ensure that concerns are addressed. We therefore recommend that Horizon establish a local forum, whereby they can engage with the community to address their concerns, and keep them updated with the project. Furthermore, we recommend that Horizon provide Welsh language courses to its employees, so they can immerse themselves in the local culture.

The environmental impact of nuclear power stations

49. During our inquiry we received many submissions from members of the public regarding the environmental impact and safety record of nuclear power stations. Many were concerned about the potential for radioactive contamination of the local environment.⁶⁶ Dr Doug Parr, Greenpeace, summarised these concerns when he outlined Greenpeace’s opposition to nuclear power:

63 See People Against Wylfa B ([FNP30](#)), Q167, Q184

64 Q161

65 Q144

66 See Elfed Jones ([FNP02](#)), Wayne Jones ([FNP09](#)), Fi Carroll ([FNP12](#)), David Orwin ([FNP15](#)), Malcolm Smith ([FNP19](#)), Timothy Richards ([FNP21](#)), Mike Parker ([FNP24](#)), Ornella Saibene ([FNP39](#)), Robat Idris ([FNP41](#)), Marit Parker ([FNP43](#)), Philip Steele ([FNP55](#)), Jill Gough ([FNP59](#)), Ron Stirzaker ([FNP75](#)), Bob Llewelyn Jones ([FNP77](#)), and Dr David Lowry ([FNP78](#))

“our concern has always been based on the issues of radioactive waste, proliferation, accident risk, to which I might add terrorism risk, as well as discharges from accident and routine operation. Solving those problems collectively would be a necessity before we would see nuclear power playing any role, and it has to be said we do not foresee that happening”⁶⁷

50. The evidence we received from members of the public showed that the recent Fukushima disaster and memories of the Chernobyl disaster had formed a basis for these concerns. The local pressure group Pobol Atal Wylfa B (People Against Wylfa B) said:

“A serious release of radioactivity following a nuclear accident at Hinkley, Oldbury, Sellafield/Moorside or Wylfa would turn large parts or even the whole of Wales into a radioactive wasteland. The terrible lessons of Chernobyl and Fukushima teach us that nuclear reactors should never be built again.”⁶⁸

51. When the Minister appeared before us, she said nuclear energy was a safe source of energy, and that nuclear power will benefit the environment because of reduced carbon emissions.⁶⁹ Furthermore, she emphasised the strong safety and inspection regime and strong regulation of nuclear power in the UK, and told us:

“When you go to an existing civil nuclear site, the calm, measured, entirely safe and robust methods that are in place are really impressive. Yes, I am very confident that it is a very safe, very safely managed means of generating electricity.”⁷⁰

52. Other witnesses, including Energy Fair, conceded that nuclear power does reduce carbon emissions, but it is less effective in doing so than renewables. They posited that this is because there are more carbon emissions in its supply chain (fuel transport, construction) than for renewables.⁷¹

53. The Minister’s view on safety was echoed by John Warden, Chief Executive Officer, Nuclear Institute, who told us that the nuclear industry had a good safety record and that the health risks from radiation were over-estimated. He said:

“If you look at straight industrial safety, nuclear power plants and the nuclear industry have the safest record of any. ... Of course, the issue with nuclear is not just the industrial accidents; it is the perception of radiation around that and the potential risk to health that comes from that. From my own background, I well understand that. I am well aware that even on a submarine when you are within 15 feet of the operating reactor you are going to get a bigger radiation dose when you go across the Atlantic in a jet. I am very comfortable with the risks and I understand it. However, I do realise that most of the public do not, and that is one aspect that the Nuclear Institute has a remit to try to educate the public.”⁷²

67 Q59

68 People Against Wylfa B ([FNP30](#))

69 Q279

70 Q300

71 Q168

72 Q94

54. A review by the International Energy Agency (IEA) in 2002 found that, in terms of deaths per unit of power produced throughout the fuel cycle for each energy source, nuclear power was less dangerous than other energy sources, particularly coal.⁷³ The review found that deaths attributable to nuclear power were in the uranium mining process. By contrast, burning fossil fuels caused a high number of deaths due to air pollution. This was supported by a 2010 OECD-NEA report⁷⁴, and a 2005 EU report.⁷⁵ Deaths from coal power in the US cause 15,000 deaths/trillion KW/hour, whilst the equivalent figure for nuclear is 90 deaths/trillion KW/hour.⁷⁶

55. Lessons have also been learned following the Fukushima incident, with the Office for Nuclear Regulation (ONR) travelling to the site of the accident to review what had happened following the earthquake and tsunami. Dr Richard Savage, ONR, told us that their report⁷⁷, which included 38 recommendations, has been used by the UK nuclear industry to improve safety:

“These recommendations have been taken extremely seriously in the UK [by industry and regulators]. ONR has produced a report summarising progress against these recommendations on an annual basis since Fukushima;...Our last assessment, which was issued in February this year, shows that...all the most significant recommendations have been addressed.”⁷⁸

The ONR said that they continually review and enhance their standards to ensure that appropriate safeguards are in place. Furthermore, they try to ensure that foreseeable events can be guarded against or prevented and that stress tests and resilience are used to prepare for unforeseen events.⁷⁹

56. Members of the public and environmental groups often pointed to the recent Fukushima accident as a reason to question the safety of nuclear power and abandon plans for new nuclear build. While the main causes of the Fukushima incident (earthquake and tsunami) are unlikely to occur in the UK, we were pleased to hear that the ONR conducted a major review following Fukushima and that the most significant recommendations have been implemented. Therefore, we conclude that the ONR will be able to regulate nuclear power in the UK to ensure its safety. We were particularly impressed by their professionalism and their ability to prepare for worst case scenarios.

57. However, the disparity of views should not be ignored. To meet the concerns of the public, it is important that the Government generally, and Horizon Nuclear Power more locally, inform the population about how nuclear power is regulated so that it operates safely. Information on the environmental impact should also be made widely available and easily accessible. Horizon Nuclear Power have done some work on this, and more information should be made available if the final site licence is granted.

73 International Energy Agency, [Environmental and health impacts of electricity generation](#), June 2002

74 Nuclear Energy Agency, Organisation for Economic Co-operation and Development, [Comparing Nuclear Accident Risks with Those from Other Energy Sources](#), 31 August 2010

75 European Commission, [Externalities of Energy](#), 2005

76 “[Fossil fuels are far deadlier than nuclear power](#)”, New Scientist, 23 March 2011

77 Office for Nuclear Regulation, [Fukushima and the UK nuclear industry](#), September 2011

78 Q260

79 Q263

The safe operation of nuclear power at Wylfa Newydd

58. The Office for Nuclear Regulation (ONR) is responsible for nuclear safety and security at 37 nuclear sites and for nuclear transport in the UK. It oversees new nuclear build, operational reactors, and decommissioning, as well as nuclear defence sites. It sets out a site licence for operators, carries out inspections to hold them to the licence, and suggests safety improvements. Its enforcement powers range from offering advice to initiating court proceedings.

59. The ONR is conducting the Generic Design Assessment (GDA) for the reactor at Wylfa Newydd. This is the first part of the regulatory process for new nuclear reactors, which assesses the safety, security, and environmental impacts of reactor designs. Instigated by a formal government request, the GDA is a four step process that takes about four years to complete, becoming more detailed over time, and allows the reactor designers to work with the ONR to make any necessary modifications. The process requires regular updates to be published on the ONR's website, where it is possible for the public to comment on the design.⁸⁰ The ONR told us:

“[the GDA] will normally be requested for new nuclear reactor technologies intended for construction in [UK]. It provides a systematic assessment of the design of potential new reactors, ensuring the designs meet the safety and security expectations of the UK's regulatory framework.”⁸¹

60. In addition to passing the GDA, a developer must also receive a site licence from the ONR (based on the design being safe to operate in a specific place), environmental permits from the Environment Agency or Natural Resources Wales, and planning permission from DECC before building a nuclear power plant.

61. The Advanced Boiling Water Reactor (ABWR) completed the third stage of the GDA process—a detailed assessment—in October 2015. It is now on the fourth stage—a detailed design, safety case and security evidence assessment—which the ONR expects to last until the end of 2017.⁸² During the process, the ONR can raise ‘Regulatory Observations’, which are potential regulatory shortfalls that should be addressed, and ‘Regulatory Issues’, which are serious shortfalls. The latter can prevent a reactor from receiving design acceptance. Currently, there are 37 Regulatory Observations and two Regulatory Issues for the ABWR. Horizon Nuclear Power has published resolution plans for all of these, and Mike Finnerty Deputy Chief Inspector, ONR, told us:

“The signs are positive. There is still work to do, but the timescale is December of next year and there is no reason to doubt why they would not achieve that timescale.”⁸³

He added that because the GDA has a stage-by-stage process, there would not be any surprises and “any big showstoppers we expect would have come to the table already”.⁸⁴

80 Office for Nuclear Regulation, [Generic Design Assessment \(GDA\) of new nuclear power stations](#), accessed 22 June 2016

81 Office for Nuclear Regulation ([FNP72](#))

82 Office for Nuclear Regulation, [UK Advanced Boiling Water Reactor \(UK ABWR\)](#), accessed 22 June 2016

83 Q245

84 Q246

Greg Evans Operations Director, Horizon Nuclear Power, also told us that the design of the ABWR had also been altered and improved to take account of the advice of the ONR and the lessons of Fukushima.

62. Once a reactor has been approved for use in the UK, and subsequently approved for use at a specific site, the ONR will then conduct periodic inspections. The inspections ensure that operators comply with their operating licence and include in-depth reviews to ensure safety and security at nuclear sites. In addition, the ONR ensures that sites have appropriate emergency preparations and response plans for nuclear accidents. The ONR will carry out these roles at Wylfa Newydd, and has the necessary resources already in place in Anglesey, because of the presence of Wylfa A. Dr Mina Golshan, Deputy Chief Nuclear Inspector, ONR, told us the ONR has also worked with the local authorities to ensure they have emergency plans in place and that action could be taken quickly in the event of an incident at Wylfa A:

“the site has an offsite emergency planning area that the local authority is responsible for. They inform the public on any incidents that may arise. Information is provided and, in the unlikely event of emergency, certain countermeasures are provided to the public.”⁸⁵

63. The Minister confidently told us that ONR is “one of the world’s top nuclear regulators” and that it is capable of ensuring that Wylfa Newydd operates safely. In particular, she said that ONR will ensure that if there was an accident at Wylfa Newydd, the appropriate action would be taken:

“The Office for Nuclear Regulation also sets the boundaries...for detailed emergency planning zones around sites, which determine the area over which they consider countermeasures would need to be deployed in the very unlikely event that there was an incident.

She also explained that local authorities have a legal duty to develop adequate plans, which includes the provision of information about the actions to take in the event of an incident. The Department for Energy and Climate Change has recently updated and revised the material it provides to support local authorities, which is now clearer and more user friendly.⁸⁶

64. The diligent and professional approach taken by the Office for Nuclear Regulation (ONR) should ensure that any new nuclear power plant will be as safe as possible. The Generic Design Assessment (GDA) for approving any new nuclear power plant is rigorous and that communication between Hitachi-GE, Horizon and the ONR has been clear and candid. We hope that the process will continue to proceed quickly while ensuring the safety case is thoroughly examined. The ONR have also reassured us that there are clear and detailed emergency plans for any possible accidents at Wylfa and Trawsfynydd, and that preparations are in place to deal with such contingencies, coordinated with the local authorities.

85 Q258

86 Q301

4 The contribution of the nuclear industry to the economy of North Wales

Contribution of Trawsfynydd and Wylfa A to the North Wales economy

65. The importance of the economic contribution of the nuclear industry to North Wales, particularly to Gwynedd and the Isle of Anglesey, resonated throughout the evidence we received. Representatives from the local councils told us that, not only had the nuclear industry been a major employer in the area, it had also been one of the few industries that provided high-paid and highly-skilled jobs.

66. Gwynedd County Council told us that Trawsfynydd had been particularly important as an employer in Meirionnydd because of a lack of well-paying jobs elsewhere in the area. The Council pointed out some factors that make Meirionnydd atypical:

- It has a sparse population (22 residents/square kilometre vs. 149 across Wales);
- the population is much older (27% over 65, compared to 20% across Wales);
- average household income is 29% below the UK average;
- 64.5% of people earn a low wage;⁸⁷
- 46.1% of people travel more than 30km to their place of work; and
- there are few large companies in the area.

67. Sioned Williams, Head of Economy and Community Services, Gwynedd County Council, told us that the nuclear sector was crucial because it provided high-quality, highly-paid jobs, which were necessary to improve the local economy:

“Average wages in Meirionnydd are £20,000 a year. In Trawsfynydd at the moment, average wages are £55,000 a year. ...The average wage for an administrative job in Magnox is £25,000, which is again higher than the average for the area. We could therefore target lots of jobs in some sectors and make no impression on changing the state of the economy. Targeting high value jobs would create more opportunities in the area”⁸⁸

68. From a cultural perspective, Gwynedd County Council said that keeping high quality jobs in the area would also be crucial for the future of Meirionnydd as a Welsh-speaking area. They contended that without high-quality employment opportunities, young Welsh-speaking people will move away. The 2011 census showed a decline in the use of the Welsh language, with 3.3% fewer Welsh speakers compared to 2001.⁸⁹ The Council therefore concluded that improved employment prospects are crucial for maintaining a living Welsh-speaking culture.

87 Cyngor Gwynedd Council ([FNP 48](#))

88 Q143

89 Cyngor Gwynedd Council ([FNP 48](#))

69. On Anglesey there are similar concerns that, since Wylfa A has ceased operation, job losses could have a serious impact on the island's economy. Isle of Anglesey County Council say that the closure will leave the island facing a difficult economic transition and that they promoted new nuclear build for this reason.⁹⁰ They also pointed out that Wylfa A had provided some of the best-paying jobs on the island. Dylan Williams, Head of Economic Development, Isle of Anglesey County Council, told us:

“the average salary on Anglesey is about £21,000 to £22,000. The average salary at Wylfa...was about £35,000. It is not just the numbers, it is the actual quality of the employment opportunities as well.”⁹¹

Furthermore, echoing the experience in Gwynedd, Glyn Jones OBE, Chief Executive, Grŵp Llandrillo Menai and Member of Anglesey Enterprise Zone Advisory Board, emphasised how crucial the nuclear industry was for providing high-quality jobs that would keep young people in the area.

“the challenge is trying to keep young people in the area. These developments are key to getting big employers and high-quality jobs with good salaries for our young people to aim at so that they do not have to consider crossing the border to England to work”⁹²

70. Magnox were able to provide some reassurance that it was preparing for the move to decommissioning and is trying to help workers get training and new jobs. For example, Stuart Law, site closure director for Wylfa, Magnox, told us:

“We gave [all the workforce] the opportunity to do any qualifications that they wanted. ...to do that could help them for their future. ...Fourteen hundred people enrolled and over 500 nationally recognised qualifications were gained as part of that process.”⁹³

71. In addition, Greg Evans, Operations Director, Horizon Nuclear Power, appreciated that the nuclear power industry had provided long-term jobs and economic security, and therefore people were eager for work at Wylfa Newydd to start.⁹⁴

72. The nuclear industry has made a major contribution to the economy of North Wales, and Wylfa Newydd would make a strong contribution in the future. Without the nuclear power industry, there is little prospect of many high-quality, well-paid jobs in the area, which will negatively affect the local economy. Furthermore, we are concerned that without these opportunities, young Welsh-speakers will emigrate from the area.

The economic impact of construction of Wylfa Newydd

73. Once operational, it is expected that 850 people will work at Wylfa Newydd during its lifespan of 60 years. The construction of the power plant is also expected to give the economy of North Wales a large boost. Horizon Nuclear Power say that, at its peak,

90 Isle of Anglesey County Council ([FNP50](#))

91 Q156

92 Q164

93 Q203

94 Q24

construction will provide between 8–9,000 jobs. They expect at least 2,500 construction employees to be from the local area.⁹⁵ In addition, Horizon Nuclear Power will invest large sums of money in North Wales during the construction and operation of Wylfa Newydd. £20m will be spent in North Wales⁹⁶ during the site preparation and clearance phase. During construction, £200m will be invested in the local area and 2,000 jobs will be created in the local supply chain.⁹⁷

74. Dylan Williams, Isle of Anglesey County Council, described the benefits to Anglesey of a project of this scale:

“Anglesey currently has about 19,000 jobs; Wylfa Newydd is predicting 8,000 to 10,000 during the build period for about six or seven years, so you can see the magnitude and the importance of the project. The 850 jobs during the operational stage for two to three generations are of a quality that would be very hard to attract from other industries because of Anglesey’s location.”⁹⁸

75. However, Glyn Jones OBE, Chief Executive Officer, Grŵp Llandrillo Menai, said that more information about the type of jobs that would be in demand was required to help people prepare for the project, and benefit from the opportunities.⁹⁹

76. Wylfa Newydd is an essential part of Isle of Anglesey County Council’s “Energy Island” programme to support the economy. The Energy Island programme aims to make Anglesey a centre of energy generation, research and development, and servicing, creating high-level jobs across a range of energy projects. The programme is jointly run by the council’s economic development unit and stakeholders from the private sector, and is supported by the Anglesey Enterprise Zone Advisory Board. The Council believes that through biomass, solar, wind, tidal, and nuclear energy projects, the programme could contribute £12bn over the next 15 years. Dylan Williams, Head of Economic Development, Isle of Anglesey County Council, said that Wylfa Newydd was the ‘backbone’ of this strategy because it was such a large project, would provide so many jobs, and was therefore vital to the Council’s economic plans:

“I do not think you can have a contingency plan for such a large-scale, complex and unique project, specifically in such a rural area such as Anglesey. I think it is very much required if we are going to turn round the current out migration.”¹⁰⁰

77. Gwynedd County Council also emphasised that Wylfa Newydd would provide employment for people living in their area. Sioned Williams, Head of Economy and Community Services, Gwynedd County Council, said:

“There are no two ways about it—Wylfa will have a substantial effect on Gwynedd’s economy...Work has been planned deliberately to ascertain key elements such as the necessary supply chains, skills and infrastructure.”¹⁰¹

95 Horizon Nuclear Power ([FNP34](#))

96 Defined by Horizon as being within 90 minutes’ drive from the site and incorporating Anglesey, Conwy, most of Gwynedd and parts of Denbighshire.

97 Horizon Nuclear Power ([FNP34](#))

98 Q157

99 Q164

100 Q156–157

101 Q147

78. However, some witnesses argued that a comparable economic boost to the area could be provided from alternative energy projects and that any major investment in the area would have a similar impact. Gareth Clubb, Friends of the Earth Cymru, was critical of the local authority, and Welsh and UK Governments for making Wylfa Newydd so central to the economic plans for Anglesey. He argued it was negligent not to plan for a non-nuclear future on Anglesey, and that there was too much reliance on Wylfa Newydd going ahead:

“They base their planning for an energy network on significant nuclear supply to the grid. If that does not happen—and we have seen what has happened with Hinkley—suddenly there is a panic. When Wylfa does not proceed, there will be panic from the council and the Welsh Government and that is not a good basis for planning.”¹⁰²

He suggested that the UK and Welsh Governments should instead encourage digital industries and life sciences to create jobs in the area, and that there needed to be a contingency plan for Anglesey should Wylfa Newydd not proceed.¹⁰³

79. The Minister told us that the UK Government was looking at other economic opportunities for Anglesey. Most of these were associated with the Energy Island programme, rather than being contingencies for Wylfa Newydd not going ahead. However, she did indicate there were other options available for North Wales:

“there are a number of different ideas...but there is a growth deal proposed for north Wales with the Treasury. That, of course, will help to strengthen the region’s economy and make the most of its connections to the northern powerhouse.”¹⁰⁴

80. The construction of Wylfa Newydd will have a large impact on the North West Wales economy, with thousands of people being hired and opportunities being provided to hundreds of businesses. The construction of Wylfa Newydd will also support the Energy Island programme and is a major part of the economic policy of the area.

81. *We heard that Wylfa Newydd is the backbone of the Energy Island programme. However, it is important that the region is not dependent on one industry, and that it has a diverse economy. Therefore, we recommend that the UK and Welsh Governments should work with Anglesey and Gwynedd County Council to progress other aspects of the Energy Island programme and to find alternative economic strategies for the area.*

Welsh workers and businesses in the supply chain and long-term jobs

82. While Wylfa Newydd would provide new jobs and opportunities, some witnesses were concerned that these would go to people from outside North Wales. This concern was in part based on that Horizon Nuclear Power’s definition of the local area, which covers anywhere within ninety minutes’ drive of the Wylfa Newydd site.

83. One way to improve the chances of local people finding employment at Wylfa Newydd is to improve skills. John Warden, Chief Executive Officer, Nuclear Institute,

102 Q183

103 Q173

104 Q294

told us the nuclear industry needed 9,000 new entrants per year for the next five years, to replace retiring workers and to meet a rise in demand.¹⁰⁵ There was also demand for engineering and construction workers due to concurrent infrastructure projects. He said “it takes [three to four years] to build the skills...to grow an apprentice, so we need to start that now.”¹⁰⁶

84. Horizon Nuclear Power have already begun to train people for jobs at Wylfa Newydd. They told us that whilst they could not guarantee that a set proportion of workers would come from the local area, they would attempt to increase the proportion by offering training and development programmes. Alan Raymant, Chief Operating Officer, Horizon Nuclear Power, said that they was looking to the long-term by encouraging young people to consider careers in the nuclear industry:

“We are talking to school children directly and recognising that the children in secondary education now are likely to be in our first crop of workers. We have been sponsoring an apprentice programme at Menai since 2011, [and] we are starting our own apprenticeship programme...taking our first intake of direct apprentices ...Horizon in September of this year, which will be the start of an ongoing programme of apprentice recruitment.”¹⁰⁷

85. For Grŵp Llandrillo Menai, which is a group of three further education colleges in North Wales, Wylfa Newydd is an opportunity to increase skills in the local workforce. They have signed an agreement with Lockheed Martin to develop training materials and are bidding to run the Operator and Technician training programme for Wylfa Newydd. They are also holding engineering apprenticeship fairs, with links to Horizon Nuclear Power’s apprenticeship programmes, and developing an employment and skills brokerage for Wylfa Newydd. Grŵp Llandrillo Menai is also developing a nuclear fundamentals course and a steel fixing and scaffolding course that would help students get construction jobs with Horizon Nuclear Power. They currently have 942 students enrolled on engineering courses and are holding STEM (Science, Technology, Engineering and Mathematics) outreach events in North Wales. Additionally, the Welsh Government has provided £5m in funding for an engineering facility at Llangefni. Glyn Jones, Grŵp Llandrillo Menai, explained:

“We are also redeveloping our campus in Llangefni. There is an opportunity to double or treble the numbers of students there. We are moving our engineering site from Bangor to Llangefni, and we are working with Horizon to develop a centre of excellence. There will be a specific building with a simulator and so on to practise the work of fitting reactors.”¹⁰⁸

86. Despite these benefits, Glyn Jones also warned that there could be costs associated with displacement, as small companies might lose workers to the Wylfa Newydd project. Therefore, it was important that Horizon Nuclear Power worked with small companies so that they too could benefit from the project.¹⁰⁹ This was a concern also raised by Dylan Williams, Isle of Anglesey County Council.¹¹⁰

105 Q93

106 Q95

107 Q36

108 Q164

109 Q164

110 Q164

87. Nonetheless, Horizon Nuclear Power told us that some jobs would have to be filled by people with specific expertise and that some constituent parts would have to be sourced from outside of Wales and the UK. For example, the manufacture of the reactor vessel will have to take place outside the UK, as no steel forge in the UK meets the technical requirements. For less specialised components, Horizon Nuclear Power told us they were working with local businesses, with some success, to bring them up to speed so that they could join the supply chain.¹¹¹

88. Professor Andrew Sherry, Chief Scientist, National Nuclear Laboratory, said that it should be possible for the Government to drive the involvement of the nuclear supply chain. The Government has set up the Nuclear Advanced Manufacturing Research Centre, with the Universities of Sheffield and Manchester, to give the supply chain the capability to be part of projects like Wylfa Newydd. Professor Sherry also argued that the Government should drive innovation, creating even more opportunities for companies in the supply chain.¹¹²

89. The Minister told us the Government had a strategy to provide people in Wales with the skills required to work in the nuclear sector. Transferability of skills, new apprenticeships, training for new graduates, and re-training for existing engineers would be crucial and the National Nuclear College would be a large part of this work.¹¹³ The National Nuclear College is currently due to establish campuses in Somerset and Cumbria, with the possibility of a Welsh campus being explored:

“As it stands, the Welsh Government are already investing significantly in the education and skills need for the nuclear sector in Wales. ...The decision on whether there will be a Welsh hub to the National College for Nuclear will lie with the NCfN board...What I can tell you is there are ongoing discussions between Welsh Government and officials from BIS and DECC surrounding the National College for Nuclear, so they are looking into that.”¹¹⁴

90. **Local businesses and people in North Wales will need assistance to be ready for the Wylfa Newydd project. We heard that programmes are in place to provide training, but that many people needed more detail on what skills would be required in order to take advantage of the opportunities provided by the project.**

91. *The local authorities, and Welsh and UK Governments should all be working together to ensure that there is a large Welsh contribution to the construction and operation of Wylfa Newydd. We recommend that they work with Horizon Nuclear Power to ensure that the local population is well trained and is able to take up opportunities at Wylfa Newydd.*

92. *We welcome the work that Horizon Nuclear Power are already undertaking with local businesses and training providers. However, we recommend that they provide greater clarity as to what they require from the workforce. This will enable education and training to be provided, to give local people the skills they will need. Furthermore,*

111 Q35

112 Q273

113 Q290

114 Q293

we recommend that Horizon seek to retain the skills of workers leaving Wylfa A. This is a ready source of skilled individuals, who will be able to transfer to the Wylfa Newydd project, either directly or with some re-training.

93. *As well as helping local individuals to gain from Wylfa Newydd, the Government should make sure that businesses in Wales and the UK are able to join the supply chain for Wylfa Newydd. We recommend that the UK Government enable businesses to take advantage of the resources of the National Nuclear Laboratory, the National Nuclear College and the Nuclear Advanced Manufacturing Research Centre, so that they are able to prepare to be part of the supply chain for Wylfa Newydd.*

94. *We find it surprising that, in light of Wales's proud role in the history of the UK nuclear industry, that the Government's plans for nuclear skills development did not have a Welsh dimension. We recommend that the UK Government correct this oversight by setting out plans to create a North Wales campus for the National Nuclear College.*

The economic impact of job losses at Trawsfynydd

95. The Trawsfynydd nuclear site is a major employer in Gwynedd, and the local council told us they are extremely concerned by the prospect of the end of decommissioning and the accompanying job losses on the site. They estimate that the decommissioning of Trawsfynydd will contribute £310m to the Welsh economy through to 2033, but that the loss of jobs has further weakened the economic situation in the Meirionnydd area.¹¹⁵

96. Furthermore, Gwynedd County Council believe that the end of decommissioning will lead to a loss of skilled workers in the area. Their aim is to retain skilled workers, but it is difficult to provide alternative employment options within Meirionnydd, as only 41 companies within 20km of Trawsfynydd employ more than 30 people.¹¹⁶ John Idris Jones, Snowdonia Enterprise Advisory Board, said that maintaining skills in the area would be important for ensuring that people in the area could take advantage of future opportunities, including Wylfa Newydd.¹¹⁷

97. Magnox told us they had made preparations to help workers when the decommissioning work at the Trawsfynydd site ends. For example, they have established a detailed schedule of the remaining work, so there is more predictability.¹¹⁸ Furthermore, Kenny Douglas, Managing Director, Magnox Ltd., told us:

“We have replaced agency or contractor staff, many of whom travel into the area, so we are keeping jobs in the area. ...our prime focus has been to keep Magnox jobs for Magnox people, and where appropriate, for them to undertake training.”¹¹⁹

98. Magnox are providing their workforce with an allowance of £1,500 for retraining and are providing assistance for people to transfer to other energy companies. They also

115 Cyngor Gwynedd Council ([FNP 48](#))

116 Cyngor Gwynedd Council ([FNP 48](#))

117 Q146

118 Q201

119 Q201

provided £91,412 in funding to projects in the local area in 2015/16 and £360,000 to fund training facilities for Coleg Meirion Dwyfor. Kenny Douglas explained how Magnox were trying to maintain local employment levels:

“We will be running down to a workforce of around 100 in the early 2020s. We need to be working with the local communities to see what jobs we can generate. We need to be looking at the Horizon programme. We also look back into the parent organisations...to look at opportunities that we can provide for those people”¹²⁰

99. The Nuclear Decommissioning Authority (NDA) are also acting to help workers at the Trawsfynydd site with the end of the current phase of decommissioning, in compliance with their obligations under the Energy Act 2004.¹²¹ It is contributing to training and employment programmes, in partnership with Gwynedd County Council and Grŵp Llandrillo Menai. This includes training workers in skills for low carbon energy projects and for “alternative high-value employment”. The NDA has also provided £7m of funding, with £39m in matched funding, to a number of local projects, including the Energy Island programme and the Meirionnydd Employment programme, a Gwynedd County Council project to boost the outdoor leisure and tourism sector.

100. *The number of employees at Trawsfynydd is scheduled to fall by 75% by 2028. This will have a severe impact on the economy of Meirionnydd and Gwynedd, as Trawsfynydd is a major employer for the area and one of the only sources of well-paid, highly skilled jobs. It is essential that the economic impact of job losses is mitigated. Therefore, we recommend that the UK and Welsh Governments work with Gwynedd County Council to find ways to maintain nuclear industry skills and to attract other high-value jobs to the area.*

120 Q202

121 The Energy Act 2004 obliges the NDA to consider the socio-economic impacts of its activities on local communities. A supplementary function is to give ‘encouragement and other support to activities that benefit the social or economic life of communities’ living near sites. See Nuclear Decommissioning Authority ([FNP 52](#)).

5 Decommissioning and waste

Decommissioning at Trawsfynydd

101. Trawsfynydd power station is in the process of decommissioning, after 26 years of operation. All Magnox nuclear power plants go through a similar decommissioning process, comprised of four steps:

- Defuelling: Fuel is removed from the reactors and taken to Sellafield for reprocessing.
- Care and maintenance preparations: Nuclear hazards (sludges and resins) and ordinary hazards (such as asbestos) are removed from the site.
- Care and maintenance: The site and reactor buildings are kept in a safe state until final site clearance can take place.
- Final site clearance: Final decommissioning and removal of remaining hazardous materials takes place when a geological disposal facility is available. Once this takes place the site will reach its end state.

102. Trawsfynydd has completed the defuelling stage and is currently undergoing preparations for the care and maintenance phase of decommissioning. The NDA has designated Trawsfynydd as one of two ‘Lead and Learn’ sites for accelerated entry into care and maintenance. The focus is on maintaining key assets, such as the reactor safe store and the intermediate level waste (ILW) store, and removing hazards, which will be treated, solidified, and placed in the ILW store.

103. Martin Moore, Trawsfynydd closure director, Magnox, told us that high hazard reduction would continue until 2022.¹²² Most of the intermediate level waste has been prepared for long-term storage and loading of the intermediate level waste store will be complete by 2022. The Trawsfynydd site contains wet ponds, which means there are a lot of waste streams and waste materials to be dealt with. For example, areas of concrete that the water has touched also need to be removed and stored as waste and ILW material must be removed from the ponds. Once store-loading is complete, from 2022–2028, work on site will focus on bringing down the height of the reactor buildings and weather-proofing them. When this is completed, the reactor buildings will be secured until 2074, when final site clearance will begin.¹²³

104. There are currently around 150 permanent employees and 100 contractors on site at Trawsfynydd. It is intended that this will fall to around 100 employees in the 2020s and for it to be reduced further when the site enters care and maintenance in 2027–28.¹²⁴ During our visit we were impressed by the resourcefulness of the management and employees on site, who are working together to retain as many jobs as possible. For instance, the innovative work of engineers on the site has enabled more decommissioning work to take place, which has in turn created jobs. One example of this includes building a bespoke engineering plant on site, which was necessary because the plant was not constructed with decommissioning in mind.

122 Q193

123 Q196

124 Q201–202

105. However, continued progress of decommissioning is dependent on stable funding from the NDA. In 2015/16, Magnox received £35m for the site and will receive £45m for 2016/17. However, funding is set on an annual basis and could easily fall, although David Batters, Chief Financial Officer, NDA, told us that funding should be stable, subject to any future spending reviews.¹²⁵

106. Progress on decommissioning at Trawsfynydd has been good and demonstrates how decommissioning can take place quickly, efficiently, and safely. We were impressed by the determination of the management and staff at Trawsfynydd to find creative solutions to challenges on site. Their work has helped to improve decommissioning plans and save jobs.

Alternative decommissioning plan for Trawsfynydd

107. During the inquiry, we heard that the plan for Trawsfynydd might change to allow for more continuous decommissioning. This would see active decommissioning take place over a longer period, rather than the site entering ‘quiescence’ for around 30 years, with employment falling to a ‘minimal level’.¹²⁶ Kenny Douglas explained how the plans could change:

“At Trawsfynydd, there was originally going to be an interim care and maintenance phase, which, with the revised plan, will disappear. The work... about fuel level debris...will run into the height reduction phase. That work then runs out to 2028–29.”¹²⁷

108. Professor Gordon MacKerron, University of Sussex, described the prospect of an alternative plan for decommissioning:

“the NDA...are going to do a radical reconsideration of this notion of quiescence and see whether it may be possible to move towards a system whereby decommissioning is continuous. I think Trawsfynydd is one of those sites where this is most likely...the argument...is quite a strong one for not losing the knowledge, not losing the skills, possibly having further export opportunities, if the process of decommissioning is continuous rather than interrupted by a period of 30 years or more of, effectively, inactivity”¹²⁸

109. The NDA’s annual strategy, published in April 2016, confirmed they would review their approach to decommissioning plans.¹²⁹ Kenny Douglas, Managing Director, Magnox, confirmed they had been asked to carry out a study of the alternative plans, and that an initial concept project is underway.¹³⁰

110. The NDA said that a number of factors made more continuous decommissioning possible. For example, the growing availability of remote decommissioning tools, more experience in remote handling and storage of waste, and new advice from the International Atomic Energy Agency all made the alternative plan an option. In addition, the NDA

125 Q197–198

126 Nuclear Decommissioning Authority ([FNP 52](#))

127 Q222

128 Q106

129 Nuclear Decommissioning Authority, [Strategy](#), April 2016

130 Q222

review found that the cost of the alternative decommissioning plan might be lower, and quicker decommissioning would make sites available for alternative use sooner. In the case of Trawsfynydd, this could include developing a small modular reactor at the site (see Chapter 6). David Batters, Chief Financial Officer, NDA, told us:

“A lot of the costs of decommissioning are ultimately related to the end use of the site. Once we know what the end use of the site is—whether it will be returned to a national park or used for future industry—that will impact on our costing and plans.”¹³¹

111. Under current plans, Trawsfynydd will lose most of its jobs within the next ten years. We heard there is a realistic plan for continuous decommissioning that could keep more jobs on site, which would be a major benefit to the local area. We recommend that, so long as that plan ensures that the high standards of safety continue, the NDA should implement it so that more people are employed for longer. We further recommend that, should additional funding be necessary, the UK Government should endeavour to make this available.

Future decommissioning at Wylfa A

112. Wylfa A closed at the end of 2015 and will begin decommissioning in three years' time, once defuelling has completed. Defuelling involves removing the 88,000 fuel elements and shipping them in casks to Sellafield for reprocessing. Staff levels will fall from 377 full time employees to 150 at the end of the three year period. Magnox told us they are helping to provide staff with training opportunities and seeking their transfer to Horizon Nuclear Power.¹³²

113. Wylfa A will have a much shorter period of initial decommissioning and will be easier to decommission because of its design. Stuart Law, Wylfa closure director, Magnox, explained why:

“we were fortunate at Wylfa. We do not have any ponds. We [have] primary dry store cells, which are...metal tubes that you stack fuel in. They do not have the same levels of contamination and the resins that you would use to keep pond water clean, so we do not have to deal with those. Also, we never had fuel element debris at Wylfa”¹³³

114. Placing spent fuel from Wylfa in dry store cells cooled with carbon dioxide will reduce radioactive contamination and the amount of radioactive waste. Some non-nuclear hazards will also be removed from the site at the same time, but most decommissioning work will take place after defuelling is completed and will then last until 2026.

115. We welcome the fact that the process for decommissioning Wylfa A will be simpler and quicker than at Trawsfynydd. This should allow the site to be ready for the construction of Wylfa Newydd, and enable a smooth transition to take place.

131 Q211

132 Q203 and Q219

133 Q217

Management of nuclear waste in Wales

116. Nuclear waste is divided into three categories: high, intermediate, and low-level. High-level waste accounts for a small volume of waste, but for most of the radioactivity. High-level waste and spent fuel is taken to be stored at Sellafield in specially designed flasks, which, for example, are able to withstand a fully engulfing fire of 800°C for 30 minutes, or being hit by a train at 100mph. Low-level waste makes up 90% of UK waste, but only 0.1% of the radioactivity. It is sent straight for storage in the Low-Level Waste Repository (LLWR) in Cumbria.

117. Intermediate-level waste (ILW) at Trawsfynydd is currently being stored on site. Further decommissioning at the Trawsfynydd site will fill the ILW store. David Batters Chief Financial Officer, NDA, said that the interim storage facilities will be secure for 150 years.¹³⁴

118. The storage of nuclear waste at Trawsfynydd and Wylfa is a temporary solution. Ultimately, the high and intermediate-level waste is due to be moved to a geological disposal facility (GDF), though the Government has not yet identified a possible site. The site will store waste up to 1,000m underground with multiple barriers to contain the waste and prevent contamination. The surface facilities will be a secure industrial complex. The underground facilities would cover up to 20 square kilometres.¹³⁵

119. The Committee on Radioactive Waste Management (a subsidiary of the NDA) has been carrying out preparatory work including geological screening (to identify a suitable site), public engagement, developing designs for the GDF, demonstrating safety, exploring international experience (particularly Sweden, Finland, Belgium, and Switzerland) and alternative disposal options.

120. Despite the Government's position, that the GDF is the permanent solution and long-term goal for storing Britain's nuclear waste,¹³⁶ progress so far has been slow. Witnesses from Greenpeace and Friends of the Earth Cymru said that without a GDF, the storage of nuclear waste was too dangerous for nuclear power to be used. Both groups also doubted whether the GDF would be completed. Lee McDonough, Director, Office for Nuclear Development, DECC told us:

“our planning assumptions...we are basically looking at 2040 as the date for the first time that waste could go in. But that is an indicative date and it is not a target or a milestone. ...[that] is not really [a long way off] in terms of the degree of engineering that needs to happen. As the Minister says, we want to go as soon as possible to get to a point where we can start to do the engineering work.”¹³⁷

121. The evidence we received is that nuclear waste is currently well-managed. The professionalism of staff on site, the technology deployed, and the flasks and storage facilities all support the view that nuclear waste is disposed of, transported and stored safely in Wales and the UK. Nonetheless, not enough has been done to enable the

134 Q237

135 Department for Energy and Climate Change, “[Geological Disposal Facility \(GDF\) for higher-activity radioactive waste](#)”, accessed 22 June 2016

136 Department of Energy and Climate Change ([FNP 26](#))

137 Q305

permanent disposal of the UK's nuclear waste. While the temporary arrangements are both of a high standard and capable of storing the waste for a long time, progress on the geological disposal facility (GDF) and finding a final site is necessary. Without a site for the GDF, it is not clear that the UK Government has a permanent solution for waste. This is a concern, as we found that members of the public want reassurance that nuclear waste is dealt with appropriately.

122. We recommend the UK Government accelerate progress on identifying the site for the GDF, and make the necessary decisions. Speeding up the process would not only help the UK to begin dealing with waste more quickly, it would also make the future for nuclear power clearer.

6 Small Modular Reactors (SMRs)

The UK Government's policy on SMRs

123. The UK Government is supporting the development of small modular reactors (SMRs) as part of its objective to be a 'top-table' nuclear nation. In the 2015 Autumn Statement, a £250m research package for SMRs was announced as part of a competition to identify a best value design and to build an SMR in the 2020s. Additionally, the 2016 Budget included plans to allocate a further £30m for an advanced manufacturing programme for SMRs, and announced that a more detailed roadmap for the SMR competition would be published. Trawsfynydd has been suggested as a possible site for a first-of-its-kind SMR.

124. In March 2016, the first phase of the SMR competition was launched, and is expected to last until autumn 2016. This aims to gauge interest in developing SMRs among developers, investors, and utilities, to gather information to guide the rest of the competition, and to develop the SMR roadmap. In addition, the Government's techno-economic assessment (TEA) of SMRs, which will also influence the roadmap, is due to be published (having been expected by March 2016).

125. The Government's policy to develop SMRs was criticised by some witnesses, who argued that SMRs are not economically viable, with no commercial SMRs in existence. Professor Gordon MacKerron and Dr Philip Johnstone stated that the National Nuclear Laboratory's estimate of a ten-year time-frame was ambitious, whilst other studies suggested SMRs could take between seventeen and twenty-six years to become operational.¹³⁸ Neil Crumpton, People Against Wylfa B, suggested that due to the timescales for deployment it would make more sense to invest in renewables now.¹³⁹

126. We were also told that it was very difficult to know if SMRs would be commercially viable in the future. Furthermore, claims for their viability relied on overturning the received wisdom of the nuclear industry, that building large nuclear reactors allows for economies of scale. Professor Gordon MacKerron and Dr Philip Johnstone's written evidence states:

"SMRs could only overturn this argument if two conditions are powerfully present. The first is that factory production would minimise the kinds of 'on site' cost escalations that have been problematic for conventional nuclear reactors. The second is that if there are orders for a large number of SMR units, then economies of scale in manufacturing multiple units would kick in."¹⁴⁰

127. Professor MacKerron concluded that it might take hundreds of units before SMRs become cheaper than large reactors on a per megawatt basis and that this made them a significant economic risk.¹⁴¹ As such, for SMRs to be viable, there would need to be a relatively large customer base for them. Gareth Clubb, Friends of the Earth Cymru, thought this was the reason why there had been no progress in developing SMRs:

138 Professor Gordon MacKerron and Dr Phil Johnstone ([FNP65](#)) and Q108

139 Q185

140 Professor Gordon MacKerron and Dr Phil Johnstone ([FNP65](#))

141 Q107

“A spokesperson...working in this field for years said, “The problem I have with SMRs is not the technology, it’s not the deployment, it’s that there’s no customers.” The problem is that it is expensive, like all nuclear energy, and no one wants to create it. If you consider the context that the cost of renewable energy is reducing, it will not work economically.”¹⁴²

128. While the National Nuclear Laboratory’s feasibility study agrees that a customer base will be necessary for SMRs to be viable, it disagrees on the scale required to bring the price down. It suggests that a first-of-its-kind SMR could produce electricity at a cost of £84/MWh, but that building and selling 15 SMRs would bring the price down to £67/MWh.¹⁴³

129. A further issue that witnesses raised was whether the Office for Nuclear Regulation would have the capacity to carry out a GDA for an SMR. In their written evidence, Professor Gordon MacKerron and Dr Philip Johnstone said:

“SMR safety licensing, including site-specific issues, would take around six years, the same time as for large reactors...the ONR is currently licensing the ABWR, the AP100 and could potentially be also licensing the Chinese Hualong design...Additional licensing of novel SMRs could place extra strain on the resources of the ONR and could contribute to delay”¹⁴⁴

130. The ONR told us they were planning for an application from an SMR vendor in the near future, and that their inspectorate team is projected to rise from 350 staff now to 500 by 2020 in order to deal with additional GDA applications.¹⁴⁵ However, the ONR confirmed that although SMRs are smaller than other nuclear reactors, the GDA process would probably take as long as for large reactors.¹⁴⁶

131. The evidence we received made it clear that while SMRs are not certain to be a source of low-cost power, they are an option worth exploring. It is possible that SMRs will be price competitive with both large nuclear reactors and renewable sources, but that case is not proven. Similarly, until a first reactor is developed, it is difficult to be sure whether a large enough customer base exists. Nonetheless, we did receive evidence from experts such as the National Nuclear Laboratory that suggested that SMRs could be a viable option and there are potential customers.

132. We support the UK Government’s objective of developing SMRs in the UK. We believe that successfully developing an SMR would be a major opportunity for the UK. However, in light of the reservations of some witnesses and the potential risks of the project, the Government’s competition must carefully consider the potential cost of any SMR project and determine whether there could be sufficient demand for SMRs. The UK Government must be sure that any decision to support an SMR developer offers value for money and a relatively high chance of successful delivery.

142 Q185

143 National Nuclear Laboratory, [Small Modular Reactors \(SMR\) Feasibility Study](#), December 2014

144 Professor Gordon MacKerron and Dr Phil Johnstone ([FNP65](#))

145 Q243

146 Q247–248

The benefits of manufacturing SMRs in the UK

133. The proposed development of an SMR in the UK could take a number of different routes. The UK could develop an SMR from scratch entirely in the UK; it could partner with a foreign vendor; or it could buy an ‘off-the-shelf’ design from a foreign vendor. In backing a vendor through one of these routes, the UK Government will have to consider cost, time to market, and the potential for bringing jobs and intellectual property to the UK. One of the proposed advantages of SMRs is that they can be manufactured at scale, bringing their cost down and allowing SMRs to be exported to a world market. The Minister explained a major benefit of SMR development:

“[The] big advantage is...that you could create...a production line for SMRs. You could make them quite commercially available, so they could be a huge opportunity for UK plc if we can build the entire supply chain, including the design of the reactor itself, and then it could be a huge exportable opportunity”¹⁴⁷

134. Buying an off-the-shelf SMR might be the cheapest and quickest option, but the UK would not accrue any of the benefits of manufacturing SMRs in the UK. By contrast, if the UK chose to go it alone, the investment costs would be substantial, and the UK probably would not be first to market. Professor Andrew Sherry, Chief Scientist, National Nuclear Laboratory, told us the UK is currently behind other countries in developing SMRs.¹⁴⁸

135. Developing a Small Modular Reactor in the UK could support the creation of a nuclear supply chain in the UK. With the National Nuclear Laboratory (NNL) and Nuclear Advanced Manufacturing Research Centre (NAMRC) located nearby in the north west of England, North Wales could take advantage of this. This will only be possible if the UK Government makes the right decision when choosing which SMR model to back through its SMR competition. Buying an off-the-shelf SMR design with no intellectual property or opportunity to partner would limit the economic opportunities to the UK.

136. For the SMR competition, the potential for partnership and job creation should be a major factor in the Government’s decision. While this must be balanced with cost, we recommend that the Government should enable either the creation of UK-based SMR developer or a partnership with an international vendor that will deliver UK involvement in manufacturing and jobs. The Government should do this by creating the appropriate regulatory and business environment. We also believe that progress has to be made soon, if the UK wants to be first to market for SMRs. Greater clarity on the potential for SMRs to be built in the UK would also help firms with nuclear and advanced manufacturing skills to prepare for opportunities in the supply chain.

137. When the UK has made its decision on the SMR competition, it should work with local authorities and the Welsh Government to deliver jobs where they are needed. North Wales is well positioned near centres of nuclear excellence in north-west England and needs investment to stimulate the economy. If SMR manufacturing can be brought to the UK, we recommend the Government should consider bringing it to North Wales, where it could link up with existing nuclear sites and the NNL and NAMRC.

147 Q307

148 Q270

The use of Trawsfynydd as a site for a first-of-a-kind SMR

138. Trawsfynydd has been suggested to us as a potential site for a first-of-a-kind SMR, and the proposal has wide support, including from local councils,¹⁴⁹ union representatives at Trawsfynydd,¹⁵⁰ local economic bodies,¹⁵¹ an SMR developer,¹⁵² and industry bodies.¹⁵³ A number of local residents also submitted evidence in support of bringing an SMR to Trawsfynydd.¹⁵⁴

139. There are a number of factors that would support the case for SMRs at Trawsfynydd. Due to its previous use as a nuclear power station, it already has available grid connections, an adequate supply of cooling water, and a skilled local workforce. Additionally, the site is already in public ownership and has not been ear-marked for any further developments, and the local population is used to the presence of a nuclear power station. Due to these factors, David Batters, Chief Financial Officer, NDA, told us that using Trawsfynydd could save money for the Government.¹⁵⁵

140. Gwynedd County Council said that developing an SMR at Trawsfynydd would be extremely beneficial for the area. Dyfed Wyn Edwards, Leader of Gwynedd County Council, told us that an SMR could help to reverse local emigration:

“the area is bleeding young people, suffers from low wages and there are people in work who are living in poverty. Such a development would therefore offer higher wages and deal with those three aspects.”¹⁵⁶

The Council also said that an SMR was the most plausible use of the Trawsfynydd site after decommissioning. Sioned Williams, Head of Economy and Community Services, told us:

“We are promoting SMR development on this site because we have looked at every other option. There is another opportunity for a data centre on the site, but that would mean about 20 jobs. There is no comparison. ... There are other opportunities, but they would provide few jobs and lower wages”¹⁵⁷

The Snowdonia Enterprise Zone Advisory Board agreed, saying that an SMR was the ‘main feasible option’, and that an SMR development would complement the Wylfa Newydd project, helping to improve skills and manufacturing in North West Wales.¹⁵⁸

141. However, there are two potential obstacles for building an SMR at Trawsfynydd. The first is that the site is not currently licensed for new nuclear build, and land around Trawsfynydd, including the lake, could be sold by the NDA. This would mean that the

149 Cyngor Gwynedd Council ([FNP 48](#)), Isle of Anglesey County Council ([FNP50](#))

150 Mr Rory Trappe ([FNP 11](#))

151 BDW Consulting ([FNP 38](#)), North Wales Economic Ambition Board ([FNP 47](#)), Snowdonia Enterprise Zone Advisory Board ([FNP 58](#))

152 NuScale Power LLC ([FNP 36](#))

153 Energy Technologies Institute ([FNP 06](#)), Institution of Mechanical Engineers ([FNP 57](#)) and Institution of Mechanical Engineers, “[Small Modular Reactors: A UK Opportunity](#)”, September 2014, and National Nuclear Laboratory ([FNP 64](#)). Industry bodies include the Institute of Mechanical Engineers, the National Nuclear Laboratory, Energy Technologies Institute, and the Nuclear Institute

154 Mr Emlyn Evans ([FNP 28](#)), Mr Matthew Griffith ([FNP 31](#)), Mr Iolo Roberts ([FNP 32](#)), Mr Hefin Jones ([FNP 44](#)), Mr Keith O’Brien ([FNP 60](#)), and Gerallt Rhun ([FNP 63](#))

155 Q212 and Q214

156 Q150

157 Q154

158 Snowdonia Enterprise Zone Advisory Board ([FNP 58](#))

site might no longer have access to water for cooling. Dr Richard Savage, Chief Nuclear Inspector, ONR, said that the use of Trawsfynydd would not be unreasonable, but that it would need to be designated a nuclear site before the ONR could assess it.¹⁵⁹

142. The second obstacle is that an SMR sited at Trawsfynydd might not be financially viable due to the location. One potential advantage of SMRs is that the excess heat they produce could be used for heating in nearby population centres. Professor Gordon MacKerron told us that the rural location of Trawsfynydd would make this difficult for an SMR to be economically viable:

“a place like Trawsfynydd is not well positioned because there is not a very large local heat load. I think if there were to be development of SMRs at Trawsfynydd it would almost certainly involve a larger premium or subsidy to the developers than if...SMRs were to be built somewhere else.”¹⁶⁰

143. Professor MacKerron based his view partly on a report published by the Energy Technologies Institute (ETI).¹⁶¹ Subsequent evidence from ETI stated that, although they thought connecting SMRs to district heating systems would improve the economic case for SMRs, they did not think it was necessary, particularly for a first-of-its-kind reactor. In both their original submission and this follow-up they state that Trawsfynydd would be a suitable site for a first-of-its-kind SMR.¹⁶²

144. Other witnesses also thought that the use of excess heat would not be necessary for an SMR to be viable and that the positives of the Trawsfynydd site outweighed this factor. The NNL’s feasibility study, published in 2014, suggested that a first-of-its-kind SMR would be cost-competitive with existing large-scale nuclear power stations, without factoring in using heat.¹⁶³ The view of Professor Andrew Sherry, Chief Scientist, National Nuclear Laboratory (NNL), was:

“I don’t think the fact that Trawsfynydd is a rural community rules it out by any means, and certainly not for a first of a kind plant, which is a proof of principle but could also generate baseload power that can be put into the grid.”¹⁶⁴

145. The Minister told us that DECC was looking at potential SMR sites and would take Trawsfynydd into consideration. Lee McDonough added that the SMR roadmap would set out the site criteria later this year.¹⁶⁵

146. It is clear that Trawsfynydd would be an ideal site for a first-of-its-kind SMR. The availability of cooling water and the grid connections mean it would meet the technical requirements, and its history as a nuclear site and its ownership by the Government mean that it would be easy to designate it as a site for SMR development. The presence of a skilled workforce, which is strongly in favour of the project, would also be a major boost to SMR development.

159 Q252

160 Q107. See also Professor Gordon MacKerron and Dr Phil Johnstone (FNP65)

161 Q107–108, Energy Technologies Institute, [System Requirements For Alternative Nuclear Technologies](#), August 2015

162 Energy Technologies Institute (FNP 06) and Energy Technologies Institute - supplementary (FNP 76)

163 National Nuclear Laboratory, [Small Modular Reactors \(SMR\) Feasibility Study](#), December 2014

164 Q272

165 Q308

147. The location of Trawsfynydd also makes it useful for a first-of-its-kind SMR. An SMR at Trawsfynydd would provide a good test case of whether SMRs can deliver value for money electricity without needing to sell large amounts of excess heat.

148. It is also clear that SMR development would be the best option for the future use of Trawsfynydd. It would be the most favourable economic option for Gwynedd, providing an economic stimulus to the area, and many-quality jobs. It would also help to keep skilled workers in the area and would provide clarity on the end status of the site, reducing the cost of decommissioning.

149. *We recommend that Trawsfynydd should be designated as a site for a first-of-its-kind SMR. The Government has told us that it will set out site criteria later this year for SMRs. In order to support the development of SMRs and the region of Gwynedd, the Government should move fast to make it clear what needs to be done for Trawsfynydd to meet these criteria and be designated as a site. That said, we are strongly of the view, based on the expert evidence we have received, that Trawsfynydd is a standout candidate for locating a first-of-its-kind SMR.*

Annex: Energy statistics

Watts, Kilowatts, Megawatts, and Gigawatts

The unit of power is a watt (W), which is defined as the consumption of one joule of energy per second.

1 Kilowatt (KW) = 1,000 W

1 Megawatt = 1,000 KW = 1 million W

1 Gigawatt = 1,000 MW = 1 million KW = 1 billion W

1 Terawatt = 1,000 GW = 1 million MW = 1 billion KW = 1 trillion W

Watts and watt-hours

A watt is a measure of capacity for a power station—how much energy it can produce in one hour. In the case of nuclear power stations, this is the electrical energy produced (excess heat energy is not measured, as it is not used).

Output of power stations is measured in watt-hours. This is equal to its output over the whole year. A power station with a capacity of 1MW would produce 8,760MWh of energy over a year, if it produced energy non-stop.

How much electricity do we use?

The average household in the Great Britain used 3,954KWh in 2014, down from 4,602KWh in 2005—in Wales it was a little lower, around 3,735KWh in 2014. The total UK electricity consumption was 295,320GWh in 2014 and total Welsh consumption was 16,451GWh.¹⁶⁶

Conclusions and recommendations

Wylfa Newydd: Cost and scheduling

1. We received conflicting evidence on the potential cost of new nuclear build and Wylfa Newydd in particular. Whilst nuclear power may not be the cheapest source of energy available, it does have the added benefit of providing value for money for a secure and reliable source of low-carbon power. We are also reassured that the taxpayer will be protected from excessive costs, as the risk of the investment is placed on the developer. (Paragraph 22)
2. *The UK Government is in favour of new nuclear build, but not at any price. Energy policy should balance cost against energy security and environmental concerns. We recommend that the Government negotiate a strike price for Wylfa Newydd below that agreed for Hinkley Point C and seek a price that would be competitive with renewable sources, such as on-shore wind. The Government should not continue with the project if the price is too high.* (Paragraph 23)
3. *We were told by witnesses that some of the costs of nuclear power are hidden. When we questioned the Minister, she said that this was not especially the case for nuclear power, but it was the case for all energy sources. As a result, energy pricing is often difficult to understand and can seem opaque to experts, let alone the general public. Without access to all the necessary information it is difficult to compare and to critique decisions that have been taken. We recommend that the Government provide a clear and comprehensible explanation of how the lifetime cost of energy sources are compared. In particular, it should show how it compares new nuclear with renewable alternatives. The Government should also be transparent about all the costs related to new nuclear build, including the eventual cost of decommissioning and waste disposal.* (Paragraph 24)

The track record of the Advanced Boiling Water Reactor

4. We received conflicting reports on the track record in Japan of the Advanced Boiling Water Reactor that will be used at Wylfa Newydd. We received evidence to explain why lower than expected levels of output were seen in Japan, but it seems likely to us that Horizon Nuclear Power will be able to achieve a load factor similar to its commercial assumptions in the different operating conditions in the UK. (Paragraph 29)

Potential delays and their impact on cost and Government policy

5. While the evidence we received from a number of witnesses, including Horizon Nuclear Power, show that they are trying to minimise the possibility of delays, recent experience suggests it shouldn't be assumed the Wylfa Newydd project will stay on schedule. We have heard that nuclear power projects have a history of cost and schedule overruns and while the ABWR has a better construction record than most, it is unlikely to be wholly immune to this. Moreover, there are a number of specific factors that could cause delays and rising costs at Wylfa Newydd. These

include the lack of experience in building an ABWR in the UK and a potential labour bottleneck for large infrastructure and nuclear projects. Horizon Nuclear Power should be planning to mitigate potential delays, and the Government should work with them to find solutions to these potential obstacles. (Paragraph 36)

6. *New nuclear build is a major part of the Government's plans for the UK's future energy supply. Wylfa Newydd is scheduled to begin operation when Britain's remaining nuclear power stations close in 2025. Although the Government told us that it is committed to a mix of energy sources, Wylfa Newydd is set to provide electricity to 5 million homes. It would be difficult to replace this provision. We recommend that the UK Government devises a contingency plan for a delayed start to the Wylfa Newydd project. It will be essential to have a back-up plan to fill the gap in the energy supply in the case that Wylfa Newydd is delayed.* (Paragraph 37)

The potential impact on Anglesey from construction and preparatory works

7. As a major infrastructure project, Wylfa Newydd will have a significant impact locally. A number of concerns have been raised by local stakeholders, including local authorities, in relation to the local environment. Horizon Nuclear Power will have to address these concerns, to mitigate the impact of construction and retain the goodwill of the local community. Additionally, there are concerns about the impact of the project on the region's status as a Welsh language area. An influx of workers from outside the area could reduce the proportion of Welsh speakers. However, as the local authorities pointed out, without jobs, Welsh speakers will leave the area. (Paragraph 47)
8. *The impact on the local environment needs to be minimised as much as possible if Wylfa Newydd goes ahead. This should include work to minimise the impact of construction work, for example from increased traffic to the site and from temporary workers' accommodation. Horizon Nuclear Power should work proactively with the local authorities, local stakeholders such as the National Trust, and the local community to take mitigating actions to minimise impacts, and to ensure that concerns are addressed. We therefore recommend that Horizon establish a local forum, whereby they can engage with the community to address their concerns, and keep them updated with the project. Furthermore, we recommend that Horizon provide Welsh language courses to its employees, so they can immerse themselves in the local culture.* (Paragraph 48)

The environmental impacts of nuclear power stations

9. Members of the public and environmental groups often pointed to the recent Fukushima accident as a reason to question the safety of nuclear power and abandon plans for new nuclear build. While the main causes of the Fukushima incident (earthquake and tsunami) are unlikely to occur in the UK, we were pleased to hear that the ONR conducted a major review following Fukushima and that the most significant recommendations have been implemented. Therefore, we conclude that

the ONR will be able to regulate nuclear power in the UK to ensure its safety. We were particularly impressed by their professionalism and their ability to prepare for worst case scenarios. (Paragraph 56)

10. *However, the disparity of views should not be ignored. To meet the concerns of the public, it is important that the Government generally, and Horizon Nuclear Power more locally, inform the population about how nuclear power is regulated so that it operates safely. Information on the environmental impact should also be made widely available and easily accessible. Horizon Nuclear Power have done some work on this, and more information should be made available if the final site licence is granted.* (Paragraph 57)

The safe operation of nuclear power at Wylfa Newydd

11. The diligent and professional approach taken by the Office for Nuclear Regulation (ONR) should ensure that any new nuclear power plant will be as safe as possible. The Generic Design Assessment (GDA) for approving any new nuclear power plant is rigorous and that communication between Hitachi-GE, Horizon and the ONR has been clear and candid. We hope that the process will continue to proceed quickly while ensuring the safety case is thoroughly examined. The ONR have also reassured us that there are clear and detailed emergency plans for any possible accidents at Wylfa and Trawsfynydd, and that preparations are in place to deal with such contingencies, coordinated with the local authorities. (Paragraph 64)

Contributions of Trawsfynydd and Wylfa A to the North Wales economy

12. The nuclear industry has made a major contribution to the economy of North Wales, and Wylfa Newydd would make a strong contribution in the future. Without the nuclear power industry, there is little prospect of many high-quality, well-paid jobs in the area, which will negatively affect the local economy. Furthermore, we are concerned that without these opportunities, young Welsh-speakers will emigrate from the area. (Paragraph 72)

The economic impact of construction of Wylfa Newydd

13. The construction of Wylfa Newydd will have a large impact on the North West Wales economy, with thousands of people being hired and opportunities being provided to hundreds of businesses. The construction of Wylfa Newydd will also support the Energy Island programme and is a major part of the economic policy of the area. (Paragraph 80)
14. *We heard that Wylfa Newydd is the backbone of the Energy Island programme. However, it is important that the region is not dependent on one industry, and that it has a diverse economy. Therefore, we recommend that the UK and Welsh Governments should work with Anglesey and Gwynedd County Council to progress other aspects of the Energy Island programme and to find alternative economic strategies for the area.* (Paragraph 81)

15. Local businesses and people in North Wales will need assistance to be ready for the Wylfa Newydd project. We heard that programmes are in place to provide training, but that many people needed more detail on what skills would be required in order to take advantage of the opportunities provided by the project. (Paragraph 90)
16. *The local authorities, and Welsh and UK Governments should all be working together to ensure that there is a large Welsh contribution to the construction and operation of Wylfa Newydd. We recommend that they work with Horizon Nuclear Power to ensure that the local population is well trained and is able to take up opportunities at Wylfa Newydd.* (Paragraph 91)
17. *We welcome the work that Horizon Nuclear Power are already undertaking with local businesses and training providers. However, we recommend that they provide greater clarity as to what they require from the workforce. This will enable education and training to be provided, to give local people the skills they will need. Furthermore, we recommend that Horizon seek to retain the skills of workers leaving Wylfa A. This is a ready source of skilled individuals, who will be able to transfer to the Wylfa Newydd project, either directly or with some re-training.* (Paragraph 92)
18. *As well as helping local individuals to gain from Wylfa Newydd, the Government should make sure that businesses in Wales and the UK are able to join the supply chain for Wylfa Newydd. We recommend that the UK Government enable businesses to take advantage of the resources of the National Nuclear Laboratory, the National Nuclear College and the Nuclear Advanced Manufacturing Research Centre, so that they are able to prepare to be part of the supply chain for Wylfa Newydd.* (Paragraph 93)
19. *We find it surprising that, in light of Wales's proud role in the history of the UK nuclear industry, that the Government's plans for nuclear skills development did not have a Welsh dimension. We recommend that the UK Government correct this oversight by setting out plans to create a North Wales campus for the National Nuclear College.* (Paragraph 94)

The economic impact of job losses at Trawsfynydd

20. *The number of employees at Trawsfynydd is scheduled to fall by 75% by 2028. This will have a severe impact on the economy of Meirionnydd and Gwynedd, as Trawsfynydd is a major employer for the area and one of the only sources of well-paid, highly skilled jobs. It is essential that the economic impact of job losses is mitigated. Therefore, we recommend that the UK and Welsh Governments work with Gwynedd County Council to find ways to maintain nuclear industry skills and to attract other high-value jobs to the area.* (Paragraph 100)

Decommissioning at Trawsfynydd

21. Progress on decommissioning at Trawsfynydd has been good and demonstrates how decommissioning can take place quickly, efficiently, and safely. We were impressed by the determination of the management and staff at Trawsfynydd to find creative solutions to challenges on site. Their work has helped to improve decommissioning plans and save jobs. (Paragraph 106)

22. *Under current plans, Trawsfynydd will lose most of its jobs within the next ten years. We heard there is a realistic plan for continuous decommissioning that could keep more jobs on site, which would be a major benefit to the local area. We recommend that, so long as that plan ensures that the high standards of safety continue, the NDA should implement it so that more people are employed for longer. We further recommend that, should additional funding be necessary, the UK Government should endeavour to make this available. (Paragraph 111)*

Future decommissioning at Wylfa A

23. We welcome the fact that the process for decommissioning Wylfa A will be simpler and quicker than at Trawsfynydd. This should allow the site to be ready for the construction of Wylfa Newydd, and enable a smooth transition to take place. (Paragraph 115)

Management of nuclear waste in Wales

24. The evidence we received is that nuclear waste is currently well-managed. The professionalism of staff on site, the technology deployed, and the flasks and storage facilities all support the view that nuclear waste is disposed of, transported and stored safely in Wales and the UK. Nonetheless, not enough has been done to enable the permanent disposal of the UK's nuclear waste. While the temporary arrangements are both of a high standard and capable of storing the waste for a long time, progress on the geological disposal facility (GDF) and finding a final site is necessary. Without a site for the GDF, it is not clear that the UK Government has a permanent solution for waste. This is a concern, as we found that members of the public want reassurance that nuclear waste is dealt with appropriately. (Paragraph 121)
25. *We recommend the UK Government accelerate progress on identifying the site for the GDF, and make the necessary decisions. Speeding up the process would not only help the UK to begin dealing with waste more quickly, it would also make the future for nuclear power clearer. (Paragraph 122)*

The UK Government's policy on SMRs

26. The evidence we received made it clear that while SMRs are not certain to be a source of low-cost power, they are an option worth exploring. It is possible that SMRs will be price competitive with both large nuclear reactors and renewable sources, but that case is not proven. Similarly, until a first reactor is developed, it is difficult to be sure whether a large enough customer base exists. Nonetheless, we did receive evidence from experts such as the National Nuclear Laboratory that suggested that SMRs could be a viable option and there are potential customers. (Paragraph 131)
27. *We support the UK Government's objective of developing SMRs in the UK. We believe that successfully developing an SMR would be a major opportunity for the UK. However, in light of the reservations of some witnesses and the potential risks of the project, the Government's competition must carefully consider the potential cost of any SMR project and determine whether there could be sufficient demand for SMRs.*

The UK Government must be sure that any decision to support an SMR developer offers value for money and a relatively high chance of successful delivery. (Paragraph 132)

The benefits of manufacturing SMRs in the UK

28. Developing a Small Modular Reactor in the UK could support the creation of a nuclear supply chain in the UK. With the National Nuclear Laboratory (NNL) and Nuclear Advanced Manufacturing Research Centre (NAMRC) located nearby in the north west of England, North Wales could take advantage of this. This will only be possible if the UK Government makes the right decision when choosing which SMR model to back through its SMR competition. Buying an off-the-shelf SMR design with no intellectual property or opportunity to partner would limit the economic opportunities to the UK. (Paragraph 135)
29. *For the SMR competition, the potential for partnership and job creation should be a major factor in the Government's decision. While this must be balanced with cost, we recommend that the Government should enable either the creation of UK-based SMR developer or a partnership with an international vendor that will deliver UK involvement in manufacturing and jobs. The Government should do this by creating the appropriate regulatory and business environment. We also believe that progress has to be made soon, if the UK wants to be first to market for SMRs. Greater clarity on the potential for SMRs to be built in the UK would also help firms with nuclear and advanced manufacturing skills to prepare for opportunities in the supply chain. (Paragraph 136)*
30. *When the UK has made its decision on the SMR competition, it should work with local authorities and the Welsh Government to deliver jobs where they are needed. North Wales is well positioned near centres of nuclear excellence in north-west England and needs investment to stimulate the economy. If SMR manufacturing can be brought to the UK, we recommend the Government should consider bringing it to North Wales, where it could link up with existing nuclear sites and the NNL and NAMRC. (Paragraph 137)*

The use of Trawsfynydd as a site for a first-of-a-kind SMR

31. It is clear that Trawsfynydd would be an ideal site for a first-of-its-kind SMR. The availability of cooling water and the grid connections mean it would meet the technical requirements, and its history as a nuclear site and its ownership by the Government mean that it would be easy to designate it as a site for SMR development. The presence of a skilled workforce, which is strongly in favour of the project, would also be a major boost to SMR development. (Paragraph 146)
32. The location of Trawsfynydd also makes it useful for a first-of-its-kind SMR. An SMR at Trawsfynydd would provide a good test case of whether SMRs can deliver value for money electricity without needing to sell large amounts of excess heat. (Paragraph 147)

33. It is also clear that SMR development would be the best option for the future use of Trawsfynydd. It would be the most favourable economic option for Gwynedd, providing an economic stimulus to the area, and many-quality jobs. It would also help to keep skilled workers in the area and would provide clarity on the end status of the site, reducing the cost of decommissioning. (Paragraph 148)
34. *We recommend that Trawsfynydd should be designated as a site for a first-of-its kind SMR. The Government has told us that it will set out site criteria later this year for SMRs. In order to support the development of SMRs and the region of Gwynedd, the Government should move fast to make it clear what needs to be done for Trawsfynydd to meet these criteria and be designated as a site. That said, we are strongly of the view, based on the expert evidence we have received, that Trawsfynydd is a standout candidate for locating a first-of-its-kind SMR.* (Paragraph 149)

Formal Minutes

Tuesday 19 July 2016

Members present:

David T.C. Davies, in the Chair

Glyn Davies

Liz Saville Roberts

Gerald Jones

Mr Mark Williams

Draft Report (*The future of nuclear power in Wales*), proposed by the Chair, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 149 read and agreed to.

Annex agreed to.

Summary agreed to.

Resolved, That the Report be the Second Report of the Committee to the House.

Ordered, That the Chair make the Report to the House.

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Monday 5 September at 3.40 pm.]

Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

Monday 7 March 2016

Question number

Alan Raymant, Chief Operating Officer and **Greg Evans**, Operations Director, Horizon Nuclear Power [Q1–38](#)

Albert Owen MP, and **Lord Elis-Thomas AM** [Q39–58](#)

Monday 21 March 2016

Dr Doug Parr, Chief Scientist, Greenpeace UK [Q59–80](#)

Tom Greatrex, Chief Executive Officer, Nuclear Industry Association, **John Warden**, Chief Executive Officer, Nuclear Institute, **Sir William McAlpine**, President and **Neville Chamberlain CBE**, member, Supporters of Nuclear Energy [Q81–99](#)

Professor Gordon MacKerron and **Dr Philip Johnstone**, University of Sussex [Q100–108](#)

Monday 11 April 2016

Professor Wade Allison, Emeritus Professor of Physics, University of Oxford [Q109–141](#)

Monday 25 April 2016

Dyfed Wyn Edwards, Leader, **Mandy Williams-Davies**, Cabinet Member for Economy and **Sioned Williams**, Head of Economy and Community Services and member of the Snowdonia Enterprise Board, Gwynedd Council, and **John Idris Jones**, Chair, Snowdonia Enterprise Zone Advisory Board [Q142–154](#)

Ieuan Williams, Council Leader, **Dylan Williams**, Head of Economic Development and **Dr Gwynne Jones**, Chief Executive, Isle of Anglesey County Council, and **Glyn Jones OBE**, member, Anglesey Enterprise Zone Advisory Board [Q155–165](#)

Neil Crumpton, People Against Wylfa B, **Gerry Wolff**, Co-ordinator Energy Fair, and **Gareth Clubb**, Director, Friends of the Earth Cymru [Q166–192](#)

Monday 9 May 2016

David Batters, Chief Financial Officer, Nuclear Decommissioning Authority, **Kenny Douglas**, Managing Director, **Martin Moore**, Closure Director for Trawsfynydd, and **Stuart Law**, Closure Director for Wylfa, Magnox Ltd [Q193–240](#)

Monday 23 May 2016

Dr Richard Savage, Chief Nuclear Inspector, **Dr Mina Golshan**, Deputy Chief Nuclear Inspector, and **Mike Finnerty**, Deputy Chief Nuclear Inspector, Office for Nuclear Regulation

[Q241–264](#)

Professor Andrew Sherry, Chief Scientist, National Nuclear Laboratory

[Q265–278](#)

Andrea Leadsom MP, Minister of State and **Lee McDonough**, Director, Office for Nuclear Development, Department of Energy and Climate Change

[Q279–310](#)

Published written evidence

The following written evidence was received and can be viewed on the [inquiry publications page](#) of the Committee's website.

FNP numbers are generated by the evidence processing system and so may not be complete.

- 1 Albert Owen ([FNP0018](#))
- 2 Anglesey Enterprise Zone Advisory Board ([FNP0070](#))
- 3 BDW Consulting ([FNP0038](#))
- 4 Bob Llewelyn Jones ([FNP0077](#))
- 5 CITB Cymru Wales ([FNP0051](#))
- 6 CND Cymru ([FNP0035](#))
- 7 CoRWM ([FNP0062](#))
- 8 Cyfeillion y Ddaear Cymru ([FNP0054](#))
- 9 Cyngor Gwynedd Council ([FNP0048](#))
- 10 Department of Energy and Climate Change ([FNP0026](#)) ([FNP0086](#))
- 11 Dr Carl Iwan Clowes ([FNP0083](#))
- 12 Dr David Lowry ([FNP0078](#))
- 13 Dr Phil Johnstone ([FNP0065](#))
- 14 EDF Energy ([FNP0007](#))
- 15 Elfed Jones ([FNP0002](#)) ([FNP0080](#))
- 16 Energy Fair ([FNP0003](#)) ([FNP0079](#))
- 17 Energy Technologies Institute ([FNP0006](#)) ([FNP0076](#))
- 18 Fi Carroll ([FNP0012](#))
- 19 Gerallt Rhun ([FNP0063](#))
- 20 Greenpeace UK ([FNP0068](#))
- 21 Grwp Llandrillo Menai ([FNP0074](#))
- 22 Horizon Nuclear Power ([FNP0034](#))
- 23 Institution of Mechanical Engineers ([FNP0057](#))
- 24 Isle of Anglesey County Council ([FNP0050](#)) ([FNP0081](#))
- 25 Jas Chanay ([FNP0085](#))
- 26 M Parker ([FNP0043](#))
- 27 Maentwrog Community Council ([FNP0066](#))
- 28 Magnox Limited ([FNP0053](#))
- 29 Mike Parker ([FNP0024](#))
- 30 Mr Brian Jones ([FNP0020](#))
- 31 Mr Chris Rogers ([FNP0033](#))
- 32 Mr David Orwin ([FNP0015](#))
- 33 Mr Emlyn Evans ([FNP0028](#))

- 34 Mr Hefin Jones ([FNP0044](#))
- 35 Mr Iolo Roberts ([FNP0032](#))
- 36 Mr Keith O'Brien ([FNP0060](#))
- 37 Mr Malcolm Smith ([FNP0019](#))
- 38 Mr Matthew Griffith ([FNP0031](#))
- 39 Mr Neil Crumpton ([FNP0040](#)) ([FNP0082](#))
- 40 Mr Philip Steele ([FNP0055](#))
- 41 Mr Rory Trappe ([FNP0011](#))
- 42 Mr Timothy Richards ([FNP0021](#))
- 43 Mr Wayne Jones ([FNP0009](#))
- 44 Mr David Bowen ([FNP0001](#))
- 45 Ms Jill Gough ([FNP0059](#))
- 46 National Nuclear Laboratory ([FNP0064](#))
- 47 National Trust ([FNP0005](#))
- 48 Natural Resources Wales ([FNP0069](#))
- 49 New Nuclear Watch Europe ([FNP0045](#))
- 50 North Wales Economic Ambition Board ([FNP0047](#))
- 51 North Wales Wildlife Trust ([FNP0067](#))
- 52 Nuclear Decommissioning Authority ([FNP0052](#))
- 53 Nuclear Free Local Authorities Welsh Forum ([FNP0056](#))
- 54 Nuclear Industry Association ([FNP0023](#)) ([FNP0084](#))
- 55 NuScale Power LLC ([FNP0036](#))
- 56 Office for Nuclear Regulation ([FNP0072](#))
- 57 Ornella Saibene ([FNP0039](#))
- 58 Paul Flynn ([FNP0061](#))
- 59 Pobl Atal Wylfa B/People Against Wylfa B ([FNP0030](#))
- 60 Professor Wade Allison ([FNP0071](#))
- 61 Radiation Free Lakeland ([FNP0010](#))
- 62 Robat Idris ([FNP0041](#))
- 63 Ron Stirzaker ([FNP0075](#))
- 64 Roy St Pierre ([FNP0022](#))
- 65 Snowdonia Enterprise Zone Advisory Board ([FNP0058](#))
- 66 Supporters of Nuclear Energy ([FNP0025](#))
- 67 The Nuclear Institute ([FNP0073](#))
- 68 Welsh Government ([FNP0037](#))
- 69 White Rabbit Grove RDNA ([FNP0017](#))

List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the [publications page](#) of the Committee's website.

The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

Session 2015–16

First Report	Pre-legislative scrutiny of the draft Wales Bill	HC 449
First Special Report	Prisons in Wales and the treatment of Welsh offenders: Government Response to the Committee's Fourth Report of Session 2014–15	HC 424

Session 2016–17

First Report	Broadcasting in Wales	HC 14
First Special Report	Pre-legislative scrutiny of the draft Wales Bill: Government Response to the Committee's First Report of Session 2015–16	HC 280