HOUSE OF COMMONS

Welsh Affairs Committee

Oral evidence: One-off session on Wylfa Newydd, HC 622

Thursday 23 September 2021

Ordered by the House of Commons to be published on 23 September 2021.

Watch the meeting

Members present: Stephen Crabb (Chair); Virginia Crosbie; Ruth Jones; Robin Millar; Rob Roberts; Dr Jamie Wallis.

Questions 1 - 68

Witnesses

I: Tom Greatrex, CEO, Nuclear Industry Association; Dr Paul Howarth, Chief Executive, National Nuclear Laboratory; Professor Laurence Williams OBE, Ser Cymru Professor of Nuclear Policy and Regulation, Bangor University; and Mark Salisbury, Head of Reactors Strategy, National Nuclear Laboratory.

II: Barbara Rusinko, President, Nuclear Security and Environmental Division, Bechtel; Ivan Baldwin, Business Development Director, Bechtel; David Durham, President, Energy Systems, Westinghouse UK; and Lindsay Roche, Director, Government Affairs, Westinghouse UK.

III: Simon Forster, Director, Shearwater.

IV: Declan Burke, Director, Nuclear Projects and Development, Department of Business, Energy and Industrial Strategy (BEIS).

Examination of Witnesses

Witnesses: Tom Greatrex, Dr Paul Howarth, Professor Laurence Williams OBE and Mark Salisbury.

Q1 **Chair:** Good morning. Welcome to this session of the Welsh Affairs Committee. We are holding a one-off session this morning looking at the future of the Wylfa nuclear power project on Anglesey. I am delighted that we are joined by a wide range of industry representatives and other experts in four subsections of the session this morning.

In our first panel, we are joined by: Tom Greatrex, chief executive of the Nuclear Industry Association; Dr Paul Howarth, chief executive of the National Nuclear Laboratory; Mark Salisbury, head of reactors strategy at the National Nuclear Laboratory; and Professor Laurence Williams, professor of nuclear policy at Bangor University. We have a lot of ground to cover over the next half an hour or so, so I will go straight over to my colleague Virginia Crosbie.

Virginia Crosbie: Good morning, gentlemen, bore da. Thank you very much for appearing on this panel. It is a panel that I have been greatly looking forward to.

We have had some recent events in the gas market that have really focused our attention on alternative energy sources, so the timing of today is very important. Is nuclear the answer? Is it the answer that enables us to have secure, affordable energy supply that is reliable for the long term? What are your thoughts on the future of nuclear?

Tom Greatrex: I think that what the last few weeks have demonstrated for energy security is that if you are overreliant on burning fossil fuels that are traded internationally for your electricity, you are subject to the vagaries of those markets and the fluctuations in price, and we have seen that. That is not something that any Government can control. We have also seen at the same time, coincidentally but significantly, periods in July and September with very low output from wind.

Those two things have meant that the price pressure has increased, so the price that consumers pay for their electricity is much higher and the carbon intensity of electricity will be higher. Whether it is the Climate Change Committee, the IPCC or anybody who looks at how you have a sustainable future low carbon system, they understand that you need some firm power that is low carbon, and that is nuclear, alongside the variable output you get from wind and solar. That way, as well as minimising your emissions, getting close to meeting net zero and the 2050 target, you are also significantly increasing your energy security. At the same time, therefore, you are insulating yourself against what has been happening in the international gas markets over the last few weeks and will continue, I think, through the course of the rest of this year, causing significant pressure on people who pay their bills, whether homes or businesses.

Dr Howarth: I agree very much with what Tom has said. The size of the challenge of decarbonising our energy economy is monumental. It is difficult to get one's head around the numbers. Basically, we need every single technology going, whether that is associated with renewables, nuclear, solar, biomass, carbon sequestration, and so on. Nuclear definitely has a role to play, but it needs to be part of a balanced and diversified mix.

Turning specifically to Wales, I think there is an excellent opportunity for Wales to demonstrate that diversified mix, to set itself out as a benchmark country of both nuclear and renewables to address the challenge that we all face.

Mark Salisbury: Bore da, good morning. Following on from Paul's point, when we look at nuclear and all the supporting technologies, we are looking at large-scale small modular and advanced modular reactors. As we move beyond electricity and into decarbonising and areas such as industrial heat or energy vectors such as hydrogen, we can see nuclear playing an increasing role there. We have also seen nuclear used for district heating and other aspects, so it is looking to that for the future. As Paul said, we see Wales as a fantastic place with both consumers and potential for bringing that together.

Professor Williams: Bore da. I agree with my colleagues. Nuclear has an essential role to play with large, gigawatt-sized nuclear power plants, AMRs or SMRs. Nuclear is a very valuable, low carbon energy source. It has a high energy density. You can put a 1,000-megawatt power plant on less than half a square mile, whereas you probably need about 150 to 200 square miles of offshore wind. Nuclear has a vital role to play.

Q2 **Virginia Crosbie:** Thank you, gentlemen. To follow up on that, nuclear power currently contributes 20% of our electricity, yet we have all but one of our large-scale reactors closing over the next decade. Can we achieve net zero without more nuclear? We have COP26 coming up in the next few weeks. The Government are committed to at least one large-scale new nuclear. Is that enough? Can we achieve net zero? Do we need to do more?

Tom Greatrex: Yes, we need to do more. It is very welcome that there is a commitment for at least one large-scale nuclear before the end of this Parliament, but I don't think that that statement gets across the urgency of the situation.

Our current fleet is doing a bit less than 20% now; it is probably nearer 15% and it is going down. It is going down because they are coming to the end of their generation lives. The first one, Dungeness, is not going to be generating any more electricity. In the next couple of months Hunterston will go off the first reactor, the second reactor in January. Hinkley B will be in June of next year. We are going to lose that capacity very quickly and the reality is that the Climate Change Committee has shown that you need more electricity capacity, twice the amount, to get

to net zero because you want to electrify other things. You want to use electricity as a source for hydrogen and so on.

For nuclear that means that for the firm part of the mix we need to do more than we currently are, at the same time as a lot of it is closing down. Large scale, small modular or AMR all have a part to play in getting to the diversified mix that Paul and others have spoken about.

Q3 **Virginia Crosbie:** Paul, on COP26 and net zero, can we achieve that without more nuclear?

Dr Howarth: I don't believe we can. I think nuclear has an extremely valuable role to play as part of that diversified energy mix. Previous work done by BEIS shows that the size of the challenge is so enormous that nuclear, renewables, fossil fuels and sequestration need to work collectively. At the moment, electricity accounts for only about 17% of our total energy mix. The other 83% all has to be decarbonised. Not only do we have to move away potentially from gas—we have seen the challenges associated with that because we are at the end of a very long pipeline that comes across Europe—but we also have to decarbonise the rest of it.

Nuclear has a role to play in electricity generation but also in the industrial heat that is required. Fertiliser, glass, cement, all of those processes, can be manufactured using the heat from nuclear reactors, and in particular hydrogen, which is definitely a fuel of the future to support decarbonising the economy.

Mark Salisbury: There is very little I can say following on from Paul and Tom but, as Paul was suggesting, a lot of the energy systems modelling shows that it is either nearly impossible or quite risky to proceed without nuclear. As Paul and others have mentioned previously, the ability to decarbonise other vectors, including electricity, makes nuclear an attractive option.

Professor Williams: I certainly agree that we need nuclear to meet the 2050 emission challenges. We have to remember that renewables are a part but they cannot be the whole part of delivering net zero. I was at a meeting recently where the European Commission reported that Germany had so far, up to date, spent over €630 billion on renewable technologies, and over the last 10 years it had made no difference whatsoever to the CO_2 emissions. Nuclear low carbon is a vital component of our challenge to meet net zero by 2050.

There are some real, practical challenges that we need to face. We have been talking about nuclear and new nuclear for at least 20 years, and so far we have one new nuclear facility at Hinkley C. We need to think strategically about the role that nuclear energy can play, not only in electricity production but, as Paul has just said, in a whole series of areas of decarbonisation, provision of process heat to industrial applications

and hydrogen production, because hydrogen is going to be a major component of the future.

Nuclear has a role to play, but we need to plan strategically where nuclear can make a contribution and what type of nuclear. We need big gigawatt power stations but we also need the small, more versatile SMRs and, increasingly, the AMRs, the high-temperature gas-cooled reactors, to provide the process heat and the flexibility for when there is a large renewable component on the grid.

Q4 **Chair:** I will come back on that answer you gave a few moments ago, Professor Williams. You rightly pointed out that there has been a lot of discussion over the last 20 years about new nuclear build but in that time we have seen only one major new project begin to come to fruition at Hinkley C. Why do you think that is? Is it a lack of appetite on the part of Government? Is it a lack of appetite on the part of the people required to finance these enormous projects? What has stopped all these good ideas? You have all made a very strong case this morning for why new nuclear needs to be part of the UK energy mix, so what has stopped the development?

Professor Williams: Tom may be able to give you a better answer on the financing, but clearly the cost of nuclear energy has had a significant impact on the decision-makers. There are plenty of good designs for nuclear facilities and nuclear reactors, both large and small, but at the end of the day you need somebody to buy one or to buy a fleet of them. You need a utility that wants to run nuclear. Government need to create the space within which nuclear energy can be used.

I started out my life working for the Central Electricity Generating Board on advanced gas-cooled reactors. The Heysham 1 advanced gas-cooled reactor, which generates about 1,200 megawatts of electricity, cost £71 million to build; Hinkley C is £20 billion or £30 billion. Something has gone wrong with the financing. My guess is that that is a major contributing factor. There is also still some way to go to convince the public that nuclear is a viable, reliable and safe energy source.

Chair: Thank you very much. I am sure we will come on to the financing issues in a few moments.

Q5 **Rob Roberts:** Thank you, panel, for taking the time to see us today. I have a couple of questions, and I would like to start off with Professor Williams. My first question has two parts, and it is specifically looking at the Wylfa Newydd project. Why do you think the Horizon project at Wylfa Newydd failed, and what can be learned from that failure to stop it happening again?

Professor Williams: I suspect it was financing, but I was not privy to those discussions. The reactor technology that was on offer, the advanced boiling water reactor, is a viable, reliable, safe and proven technology that would have provided two or three gigawatts of capability

on the Wylfa Newydd site. I suspect it was the financing and also probably some change in Japan's commitment to nuclear energy following Fukushima.

Mark Salisbury: For any project, there are a couple of things that you need in the ecosystem for a project financing developer. Going back to February 2019, Gwen Parry-Jones, who at the time was the executive director of operations at Horizon, said that they couldn't structure a deal for the financing but that she believed all the parties had done the best they could. Again, not being a financing expert, I would refer back to some of the testimony from Gwen and others at the prior Select Committee.

Tom Greatrex: I think three things came together at the same time. The first is that the current, but hopefully soon to be replaced, policy framework for financing large-scale infrastructure, including new nuclear, is not able to deal with the capital intensity of a project. You need almost all the money at the start, basically, to build it and then after you have a facility that runs for a very long time with low and predictable running costs and produces a lot of electricity, as Laurence has already said. At the same time, Hitachi, which owns Horizon, was reassessing its strategy and what industries it wanted to be involved in internationally. That had an impact as well. The third thing that came together at the same time was that it was before the net zero commitment. It was also at a time when the then Secretary of State was saying we have an abundance of energy and that we do not need to worry about it too much. I think there was less urgency in public policy. Those three things came together.

We may come on to talk about financing in more detail, but if a potential RAB model or equivalent was around at the time that decisions were being made, I think we could have been in a very different position with Wylfa Newydd, because it is a very good site. It is a site that lots of people are interested in, whether a potential large-scale reactor or a small modular reactor. Rolls-Royce has expressed interest in the site and so on. It is a very good site; I don't think it is a problem with the site. It is more about the circumstances at the time that led to that deal unfortunately not going forward.

Dr Howarth: I will pick up some of the points that Tom raised and go a little further into some of the issues. There are some key things that are worth recognising about financing and the economics of nuclear, and Tom touched on that. Nuclear is different from other energy technologies. The capital cost up front is very large, but once that is overcome the operating costs are among the lowest for energy technologies and are very predictable for many years. You would not have anything like the gas spikes that you are seeing at the moment.

What the industry, collectively with Government, needs to look at is overcoming the hurdle of the up-front financing costs. When the nuclear industry restarts the construction of plants, like the plant that was

proposed at Wylfa, there is no technology uncertainty. It is just a civil engineering construction project, but it is a very capital intense construction project. It doesn't matter what sort of infrastructure it is, it is how the country can fund those large capital infrastructure projects. That is what we have to look at, with the Government getting the finance mechanisms right. At the same time, we are looking globally at restarting the construction of large nuclear plants, so there is more learning to be had.

The answer we need to get to is that we have to keep the faith in this and we have to go through new nuclear build and get into fleet build mode. Once we get into fleet build mode, the industry gets much more familiar with how to build these plants and builds up the knowledge and know-how. Secondly, on the financing, the finance community sees a reduction in the risk. The weighted average cost of capital is the thing that needs to come down at the start of the construction. Once a country gets into fleet build mode and the developers know how to build them, the financiers get comfortable and associate a low risk with it. That massively drops the cost of nuclear, making it incredibly competitive, and that is where we need to get to.

Q6 **Rob Roberts:** That is a very comprehensive answer. Thank you very much for that. I will stick with Dr Howarth for the second part of my question. Given all those things and all the things we heard from the other members of the panel, how likely do you think it is that we get a new large-scale nuclear project successfully delivered in the foreseeable future?

Dr Howarth: It very much comes down to the financing mechanism being put in place, and that is a role for Government. As I have mentioned, any large infrastructure construction project needs to ensure that the financing is addressed. There also needs to be a signal to the industry that it is not just a one-off plant build, as fleet build makes it much more attractive for financing and for private sector to then come in and finance. It gives a commitment to the industry and it gives a commitment to the supply chain as well.

What I am concerned about is that if we don't address that and get that financing instrument approach correct, developers of nuclear will go elsewhere, to other countries, and we won't be able to attract those developers. As a country we are not a vendor of large nuclear. We potentially are for SMR and for future reactor systems but not for the large. We have to set our stall out as a country to get that financial instrument right and get a long-term commitment to get into fleet build mode.

Professor Williams: As I mentioned before, you need to have a customer. You need to have somebody who is prepared to take ownership of the design, the construction, the commissioning and the eventual operation. At the moment, we have basically one nuclear licensee. EDF UK operates the EDF reactors. Magnox Limited used to be a

nuclear licensee but its capability for being the controlling mind or the intelligent customer for a nuclear power plant is waning. There is a practical issue here. We need to have a customer and a licensee. Hitachi developed a licensee, Horizon, but that has now disappeared. It is all very well saying it would be nice to have a new nuclear facility, but we need to create a customer. We need to create a licensee who will take control of the project.

Rob Roberts: That is a very good point.

Mark Salisbury: I completely agree with Laurence and Paul. You are looking for the financing, and you see those costs come down rapidly as you get into fleet build.

Forgive me, the exact reference escapes but if it is helpful I am happy to write to the Committee later. Studies show that had we built a follow-on dual unit at Sizewell we would have approximately halved the capital cost of building that. We have seen similar cost reductions with offshore wind, where with the scale, the fleet effect as Paul described it, we have seen the cost come down. That is where we need to be going with nuclear. In the 1950s, 1960s and 1970s with the Magnox fleet we were able to build approximately one large power station a year. While the electrical output was similar to an SMR back then, the demand was such as to build one large construction project each year under the old Central Electricity Generating Board.

Q7 **Rob Roberts:** Finally, Mr Greatrex, as well as asking how likely you think it is that we will deliver one of these, Dr Howarth said that the Government need to provide an awful lot of support. How much support do you think needs to be provided by the Government and how much should be provided by private industry? What kind of split might be a good mix?

Tom Greatrex: The Government, as you may be aware, consulted on a different financing mechanism, a regulated asset base mechanism, for infrastructure, including for nuclear. For that type of model, it is not so much that a huge proportion of the money comes from Government. It is more that we have a mechanism that is more attractive to the investment community because there is a predictable rate of return, including in the course of construction. That is critical, and it is key to whether anything else happens beyond Hinkley Point C in the current situation, be that at Sizewell, Wylfa or other sites. That is significant whether it is large-scale or smaller modular reactors.

You would not build a factory to build one reactor. It doesn't make any economic sense. You have to have enough of a sense of commitment that you want to have that fleet, a number of reactors, and a number of reactors means that cumulatively you get the cost down over a period of time so it is a win-win. The worst thing you could do is what we did with Sizewell B, which is to build one and then stop. There is a danger that if we don't get this fixed we will do exactly the same. We will build Hinkley

Point C and then we will stop, and then a few years later someone will say, "We need to do something, we need to get some new nuclear again." We would then miss the opportunity to get the costs down significantly, to keep the supply chain working and to continue to be more efficient. Having reactivated the supply chain in many regards for Hinkley, it is potentially a real missed opportunity if we don't take the development of that supply chain and use it for other projects from which we know we are going to need the electricity capacity, including potentially at Wylfa. Again, whether that is large or modular reactors, we need to get on with it. That is the real challenge.

Rob Roberts: I appreciate that, thank you.

Q8 **Chair:** You talked about the fleet build effect, and the Government's ambition is for one new nuclear power station. How many do we need to constitute a fleet? How many should the Government be talking about? How many do you need for those effects to kick in?

Tom Greatrex: The fleet build effect gets better the more you do. Sizewell C will effectively be a copy of Hinkley Point C, and that will mean you do not have to license the reactor design again—that has been done. You do not have to qualify the equipment again. You have reactivated a lot of the supply chain. You have those relationships. All of those things can help to have an impact. Hinkley unit 2 is significantly ahead of unit 1. You are building two units together so you can demonstrate that live at the moment. If you really want to have a beneficial fleet effect, you have to say to the people who want to build them, "You need to know you are going to do three, four, five or six, because then you can programme that in and you can share the costs and that gets the costs down,"

On how much we need, if you look at it in gigawatt capacity, all of the different models that have been done by BEIS, the Climate Change Committee and others show that for net zero you need at least 20 gigawatts, potentially significantly more. On capacity, at the moment we have, if you include Dungeness, about eight gigawatts roughly, and that is all closing. Hinkley will be 3.2 gigawatts. If you say for a large-scale reactor you need three gigawatts, to get to 20 you need about seven of those. You would not have to do it all with large, you could do some of it with small modular reactors. The Rolls-Royce one is about 400 megawatts.

That gives you the scale, but to keep to a similar proportion that we have now as a percentage of electricity capacity, we will need double because we will need twice as much electricity capacity to be able to get to net zero. Electricity demand will go up; therefore, the demand for nuclear will go up. That is the urgency. When it says that the Government have committed to one, the "at least" in front of that is doing a lot of heavy lifting. If we are serious about net zero, "at least" needs to be underlined three times. It is not about doing just one and thinking that is it, job done. It is about getting that one and then getting on with others if we are serious about net zero.

Dr Howarth: I will start with a clarification of my last answer about Government. It is not necessarily Government putting the financing up for the plants. It is Government getting the financial instrument right, working with the private sector to support the financing of nuclear.

We have seen fleet build around the world previously. Mark mentioned previous success in the UK with the Magnox fleet. We have learned from what South Korea has done and also from France with the N4 fleet that was constructed in the 1980s. We have indications showing that, as Tom mentioned, when you get to about four or five units, you start to ameliorate the large impact of the up-front costs for the first reactor. It is approximately about that level.

On the number of reactors, as Tom mentioned, it is probably double to address the electricity that is needed, but electricity is only 17%. We still need to think about the 83% that we need to decarbonise. This potentially means that nuclear needs to go much further for the multiple of the capacity that we have at present.

Q9 **Virginia Crosbie:** You mentioned that on these large capex infrastructure projects it is all about who takes on the risk and the weighted average cost of capital. We have seen that the RAB model was very successful with the Thames Tideway tunnel, and you have talked about how, if the Government are showing initiative and leading on this, we will see a lot more private investor money coming in, particularly with the SMRs. What does this mean for consumer bills? Could you underscore what it means for the end user?

Dr Howarth: It is a balance between where the cost is going to arise, either through Government financing it—and Professor Williams mentioned the costs of renewables that have been borne by the Government in Germany—or through the cost falling to the consumer. The issue that needs to be addressed is how that is appropriately spread and the division that is placed there. It is worth bearing in mind that with nuclear, once the capital cost is overcome and is amortised on the plant, which is generally about a 30-year lifetime, these plants will operate for 60 years if not longer. Then the cost reduces substantially and it is very certain, without the spikes we have seen. Tom may be well placed to answer that question.

Tom Greatrex: The significant impact of a RAB model is to reduce the cost of capital. If you look at Hinkley as a current live example, EDF will tell you that almost two thirds of the cost is from financing and taxation. The build cost is not the larger part of it. If you can reduce the cost of capital and the amount that it costs to get the investment, you have a big impact on what ends up being added to consumer bills if it is done through a strike price. If that strike price is significantly lower, an order of magnitude lower, and if you can deliver it with a cheaper cost of capital, the cost that ends up being passed on to consumers is a lot lower. Even if, as some people argue, a RAB model or something equivalent effectively transfers some of the risk to the consumer, the

overall impact is that the bill will be lower. The contribution coming from the consumer will be lower because the cost of capital is significantly reduced and the pool of investors that are attracted to it—because they are used to the mechanism and they can see the return rates—is much higher.

That all means the cost of capital is much lower, which is the most significant impact in getting these large projects under way. As others have said, of the capital you need, almost all the money is spent at the start before it generates electricity, but then you have a piece of infrastructure that works for a very long time with a lower, predictable running cost.

Q10 **Robin Millar:** Good morning, gentlemen. Thanks for your time. It is fascinating to hear you talk about this. Let me dive into a couple of straight questions, and then I might follow up with a couple of points. The UK Government announced an advanced nuclear fund. Do you think that will help with the development of new technologies?

Dr Howarth: That is a good question, and I am very supportive of the Government's approach on the advanced nuclear fund. What we have long been discussing with Government on the approach in the UK is what we call a balanced portfolio of reactor technologies. We have the gigawatt plant build. They don't require any technology development; they are ready to go. We have the UK programme led by Rolls-Royce on the small modular reactor, which looks to productionise nuclear to get it into that fleet build mode much quicker. It is a smaller size of unit manufacturing, with a lot taking place in the UK. Then we have the opportunity for advanced nuclear.

As Professor Williams mentioned, high-temperature gas-cooled reactors are certainly a very attractive option for the UK. We have a lot of knowledge and know-how with those reactor systems. They operate at a much higher temperature and have inherent safety features. They can use the heat output for industrial processes such as hydrogen generation. I strongly support the Government's approach in investing in those reactor systems. I think there is a real opportunity for the UK to take a leading position in this.

Robin Millar: Thanks very much. We are familiar with some of those points. It is the specific point about how the fund helps.

Professor Williams: I think the fund is very welcome, for both SMR development and for the range of advanced modular reactors, high-temperature reactors, high-temperature gas-cooled reactors, the lead-cooled fast reactors and sodium-cooled fast reactors.

The fund also has some additional money to support the supply chain, and all of these, whether it is the AMRs or the SMRs, will require new types of fuel. Perhaps we need a little more money to support the development of these new advanced fuels. It would also be good to have

a commitment that those fuels would be manufactured in the UK. We have been very fortunate in the UK throughout our nuclear power programme to have our own fuel manufacturing capability at Springfields. We need to maintain that for the advanced fuels.

I think some of the money associated with the supply chain has been allocated to the regulators. Perhaps less so with the Rolls-Royce SMR, which is a light water reactor technology, but some of the advanced modular reactors will require additional regulatory scrutiny. We must make sure that the fund also ensures our regulators have sufficient resources to regulate these designs.

Q11 **Robin Millar:** Could you comment on the safety of some of these new technologies?

Professor Williams: Nuclear technology is safe. I know people tend to focus on Fukushima and Chernobyl but, by and large, we understand how nuclear works. I have coined a phrase of a triple lock that ensures society can safely accept nuclear technology. In the UK we have a requirement that only a fit and proper organisation—a licensee—can hold a nuclear site licence, and the regulator scrutinises those organisations. In the UK we have developed competent nuclear licensees who not only understand the technology but have their own internal safety departments, which neither Fukushima in Japan nor Chernobyl had. The third lock is the competent, independent regulator. I am quite confident that the designs on offer are all capable of delivering high levels of safety.

Q12 **Robin Millar:** Mr Greatrex, could you make a quick comment on the advanced nuclear fund?

Tom Greatrex: The only other thing is that with some of those reactor designs—they are at an early stage, and they are nowhere near ready for deployment yet—having that fund and using it to help to develop those reactor designs is important not just for the UK market but for the export potential, which is important for wider UK Government policy. There is a potential beneficial impact on exports, as well as the potential domestic deployment.

Q13 **Robin Millar:** I know time is pressing, so we must move on, but I will throw a quick comment back to you, if anyone would like to respond. It seems to me that there is a degree of "have my cake and eat it" going on here. You mentioned the question of risk. We all know that financing prices in risk, so they are not separate; they are linked. You said that taxpayers have something to do in paying up front, but then consumers bear some of the risk further down. Well, taxpayers are the consumers, and I am a representative of the taxpayer—if not the client, then certainly the purse holder of the client. I am very concerned by that. It feels like the Government are being squeezed into a position where, whichever way they turn, the price goes up.

Tom Greatrex: I don't think that is an accurate characterisation of what anybody has said, frankly. The reality is that if you reduce the cost of

capital by using a different financing mechanism, the cost to the consumer is lower. It does not matter what you are doing with energy infrastructure, all of it in one way or another gets paid for by the consumer. The point is how you get the mix you need for the future at the lowest cost to the consumer.

A different financing mechanism, if it reduces the cost of capital, will make that contribution lower. That might mean you get some revenue earned during the course of construction, so before the delivery of the power, and that is one of the features of a RAB-type model that has been used in other infrastructure like the Thames Tideway. It has been used, I think, at Heathrow terminal 5 and various other things. There is a lower overall cumulative impact on the consumer than if you use the mechanism that has been used for large offshore wind, for example, and for Hinkley and for many other projects.

Q14 **Chair:** We are pressed for time, Tom Greatrex, but could I quickly follow up on that? When Greg Clark was Secretary of State he made a statement in the House of Commons in January 2019 about the failure to progress with the Wylfa site. Greg Clark was very clear then about not wishing to see the Government become a large shareholder in the project, not wanting the Government to bear the majority of the construction risk during the project and not wishing to see a strike price higher than £75 per megawatt hour. Are you saying that with a regulated asset base model we basically overcome those hurdles and that the problems Greg Clark outlined at the time become less relevant or disappear altogether?

Tom Greatrex: They do become less relevant because the cost of capital, if it is significantly reduced, means the strike price is a lot lower. It increases the pool of investment, so the pressure on Government to be part of that reduces. The delivery, particularly if you are doing a repeat build or you are going to do more than one reactor, also means you get efficiencies in the cost of construction. All of the issues that were highlighted at that time are significantly beneficially impacted by the adoption of a RAB-type model.

Arguably, Greg Clark launched the Government consultation on the RAB model because that was starting to be recognised at the time. It is a shame that Wylfa was not a couple of years before, because things might now be happening there, rather than it being a site that is very attractive for nuclear development but is currently lying idle without a proposal to develop it.

Q15 **Chair:** Is it your view, Mr Greatrex, that the window of opportunity at Wylfa has closed, or do you still see opportunity there?

Tom Greatrex: No, I don't think it has closed at all. With the urgency of the situation, it is very disappointing that there is not more happening now but, as I said before, it is a very good site. Its geology, geography, links with the supply chain and community support mark it out as a very

good site for whatever you want to do there. There are people who are interested; you are talking to some of them in your next sessions. There are others, including the Rolls-Royce SMR, who are also interested in the site. It is a very attractive site. The key to unlocking it, though, is getting the financing mechanism in place that will attract the pool of investment that makes these potential projects much more viable. I think the site is a very good site, so I don't think it is all over. It is disappointing that there is not more happening now but it is not beyond rescue.

Chair: We have run out of time for this part of the session. I can see other members of the panel nodding their heads and agreeing with those remarks, so I am not going to take any further comments. I thank you all for your time this morning. That was extremely interesting and very helpful. We will take a moment's pause while we allow our second panel to get ready. Thank you, gentlemen.

Examination of Witnesses

Witnesses: Barbara Rusinko, Ivan Baldwin, David Durham and Lindsay Roche.

Q16 **Chair:** Good morning. Welcome to our second panel in this session looking at the Wylfa site in Anglesey. We are delighted to be joined for this part of the session by Barbara Rusinko, president of the nuclear security and environmental division at Bechtel, along with her colleague Ivan Baldwin, who is business development director at Bechtel UK. We are also joined by Lindsay Roche from Westinghouse UK, and online we are joined by David Durham from Westinghouse UK. Welcome to all four of you. We are very grateful for your time this morning. We will kick straight off by asking Rob Roberts to lead the questioning.

Rob Roberts: Welcome, panel, and thank you very much for your time. We will start with a very simple outline of your proposals for the development of Wylfa Newydd, your chance to pitch. This is wonderful.

Barbara Rusinko: Bore da, good morning. Around the table and David on the video, we are passionate about the topic of nuclear power as a force multiplier. It is with the environment, it is with the community and it is with the people of Wales. I am happy to say that the UK is providing global leadership on the climate change agenda. You see this unfolding every day, the legislation for net zero and the ambitions set out in the Prime Minister's ten-point plan for a green industrial revolution, and nuclear plays a key role in point No. 3. Specifically for Wales, and notably the island of Anglesey, it has a pivotal role in making this happen. As was spoken about by the previous panel, it is regarded as the best site in the UK to build a large-scale nuclear power station.

Our team has a plan to facilitate the build on the most advanced nuclear technology today, and it is the Westinghouse AP1000. It is capable of delivering clean power to the latest carbon budget commitments by 2035. The plan recognises the significant pedigree of Wales and the UK as a nuclear nation. There is technical talent in the country to help deliver

this. It also strengthens the transatlantic security partnership. We all view nuclear power and national security as integral, and we believe it unlocks an economic potential that exists on Anglesey and across Welsh communities.

As I mentioned, nuclear power is what we call a jobs multiplier, generating well-paid and highly skilled careers, not just in the hundreds of plant jobs that operate these facilities but throughout thousands of advanced manufacturing facilities and sustained manufacturing supply chain roles across Wales and the north-west of England. This is the catalyst for the creation of a capability base, not just for the build we are talking about at Wylfa but also including small modular reactors and the advanced reactors that were talked about earlier. It creates a supply chain for all of that for the future.

You can see there is another piece of this, which is export. The AP1000 is exported across other countries and it can also be the supply chain base for their decarbonisation commitments outside the UK.

We look at 2035 and 2050 and it seems very far away, but it is not. As we heard earlier, there is a very short window to get to net zero and we have to rely on technology that is proven in the field, not in the development phase. It is two-pronged: what can we do today while we mature what we can use for the future? Our view for Wylfa is a credible gateway to this greener future. By using the most advanced, established and leading technology of today, we will create the supply chains, the know-how and the talent for future needs.

Between our two companies, Westinghouse and Bechtel, we have over 100 years of experience in this market, Westinghouse providing world-leading reactor technologies and Bechtel bringing the nuclear project delivery and construction, and that is global. This is what helps us give more confidence on our certainty of delivery.

Our plan for Wylfa is based on the reference project at Plant Vogtle in the United States. I spend a lot of my time at Vogtle and it is going into commercial operation, due to begin in 2022. The two units at Vogtle are the fifth and the sixth of the AP1000s to go into commercial operation, so tried and tested in the field, operating and performing units. It is also a technology that has already been licensed by the UK Office for Nuclear Regulation, which is an important step that we don’t have to go through.

While American in origin, our countries are global countries. We have a long UK history. The previous panel mentioned Westinghouse’s Springfields fuel manufacturing facility. David has therefore produced fuel for UK power plants for over 75 years, so there is a long history here in the UK. We understand the significance of this project for the community. It has power to level up, to reverse the talent migration that has happened and to provide hope for young people and their families in the area. I have children in their 30s, and climate change is a huge issue we talk about all the time. They always look at what we are doing to help to

fight climate change. I think this offering in Wales will give young people an opportunity to have jobs that will make a positive contribution to the fight against climate change, which I think will be very rewarding for them.

It is our experience across the globe that Governments do and must play a role in the development of nuclear power plants. The UK Government have to decide—this was talked about earlier—whether or not to back this project. We have talked a little bit about the failed private sector ones, Horizon at Wylfa and NuGen at Moorside, and they demonstrate the need for Government intervention to get these projects across the line.

In recognition of this, we have developed an approach for Wylfa that would create the conditions to attract new utility and investors, which we have said is necessary, again leveraging the successful approach from Vogtle. Governments across the globe have recognised the importance of leading the nuclear build, whether through state-owned developers or through direct funding, and we see this in other countries. To succeed, to generate reliable, clean power for millions of homes, we need the UK Government to demonstrate backing for the project through a commitment in the upcoming comprehensive spending review.

The AP1000 plant can prove transformational for Anglesey, for Wales and for the UK with Government support and the energy goals, and it is an exciting and regionally transformational path to 2035. With that, I thank you very much and we look forward to your questions.

Q17 **Rob Roberts:** Thank you very much for that strong argument. Let me turn to Mr Durham very briefly. Thank you for joining online. What is different about your plant? What is unique about the AP1000? What is your USP, for want of a better term?

David Durham: Good morning, and I apologise that I can't be with you. I am at the P-TECC ministerial meetings in Warsaw, so I am joining you from my hotel room.

The AP1000 is unique. It is literally—and this is not the sales pitch—the safest reactor in the world by all safety metrics. It is the only reactor in the world that has fully passive safety systems. If you think about what happened in Fukushima, every reactor in the world needs water to cover its fuel when the reactor shuts down to keep the fuel cool, to prevent it from melting. Every reactor has various systems of backup power, power coming from another power plant, batteries, diesel generators, things like that. Fukushima wiped out all those backup sources of electricity through the tsunami. We call that station blackout.

AP1000 was designed specifically to address station blackout. In a station blackout situation, the AP1000 shuts off all by itself. It passively cools the fuel for more than three days all by itself, without a single electron of electricity, without a single human action. Within that 72-hour period, the only thing human beings need to do is have two people to carry a small

pump and a hose with a water source up to the top of the reactor and refill the top tank, and then you get another seven days of cooling. That is the uniqueness of the AP1000. If the AP1000 had been operating at Fukushima, it would have been a total non-event. No other reactor in the world can say that.

Q18 **Rob Roberts:** I appreciate that. Thank you very much. I am reading from your description of the AP1000, which I have read previously, that it is a very modularised system, uses less material, easier to construct and it leads to faster and lower cost construction of the plant itself. What are you giving up? Wonderful things, these are good things, less material, easier, faster, lower cost, but there is always a downside to those good parts. What is the downside?

David Durham: Frankly, I don't know of a downside, to be honest. All of those statements are true. The AP1000 has a smaller footprint than several SMRs that are being developed. It is true about the materials. It requires fewer systems, less equipment, less machinery, yet it has a better safety performance than any of the active plants. To be frank, I am not sure that we are giving up anything. I can't think of anything.

Rob Roberts: I suspected that the owner of the technology might not have any.

Q19 **Chair:** Mr Durham, in the previous panel—I am not sure whether you were able to hear—there was some discussion of fleet effects. My question to you or perhaps to associates from Bechtel is: do you need a number of projects in one country to achieve fleet effects or do you get those fleet effects because you have done other projects around the world?

David Durham: I was listening to the entire session earlier, so I did hear that. You do not need a fleet of units in one country to get the fleet effect. You need nth of a kind. Nth of a kind means the same exact reactor, no changes, no significant changes anyway, from one country to another. We are already at five and six. By the time we would start constructing at Wylfa, Wylfa would probably be at least eighth or maybe tenth, given the selection of the AP1000 in the Ukraine for five units, the selection in Poland for six, and then a couple of other opportunities. That is not even counting the six more that China is starting to build. We are truly nth of a kind and as long as you keep that design the same, that is a fleet.

I will add, though, that you need a competent constructor. If you start all over again with an inexperienced constructor in a new country, you are losing some of the fleet benefit that you gain. That is where our partnering with Bechtel is very helpful. They are completing Vogtle and are doing a great job taking over from a prior constructor that was inexperienced. They are our partner in Poland, the Czech Republic and Slovenia.

Barbara Rusinko: Once you are in one country, however, you get more efficiencies as you are using the same supply chain. David is correct about the type of plant, but when you are in the UK and you are exercising that supply chain over and over again, you get more efficiencies.

Q20 **Virginia Crosbie:** The Prime Minister said he is a fervent supporter of Wylfa Newydd, and Greg Hands, when he was appointed Energy Minister last Wednesday, was straight on the phone to arrange to come and visit Wylfa Newydd. The original Wylfa was set up to provide energy for Anglesey Aluminium and we have seen decades of disinvestment following the closure of Anglesey Aluminium. What is your view? Why do you think Wylfa Newydd is the best site in the UK and what does this mean to the community?

Ivan Baldwin: If I can pick up on the community point first, I have been spending quite a bit of time in the local community. I also sit on the Nuclear Industry Council, representing the activities in nuclear regions across the UK.

Anglesey is a very special nuclear place. There is a real social licence to operate there. It is one of those places where multiple generations of people understand the value of nuclear, the value of the jobs and the high quality of the jobs, and the value of the apprenticeships that it will bring. For a project like this, you are probably looking at 700 apprenticeships created through the process of the build. Then you have the long-term impact on the community: 900 jobs in the operations, highly skilled graduates, and with a revenue stream of approximately £500 million a year, making it one of the biggest companies in Wales during that time.

The people I have spoken to in Anglesey say they have been very lucky. I have been speaking to people from close by at Bangor University, at M-SParc, people who worked at Wylfa previously, and these are people who really want to see the show on the road, see those jobs come back to the island and are incredibly keen to make things happen.

Lindsay Roche: Wylfa is a site that we are familiar with. It has been of interest for an AP1000 for some years. It is a large site. We have talked about the geology and the geography, which physically makes it a perfect site. To extend on Ivan's points—and David was talking about the modular approach as well—and tease out what that means in practice, I would like to draw on my experience. I was supply chain director for the NuGen project. When you have a modular build you have offsite construction of the modules that will be placed in the reactor. Those could be large structural modules or smaller mechanical modules. They can be fabricated offsite, so we start to spread the regional economic benefit of this project by establishing factories and providing skills and job opportunities right across the region.

In the work we did a few years ago, we worked very closely with the

Nuclear Advanced Manufacturing Research Centre to look at UK supply chain capability. The UK is well placed to create that industry. We talked about a fleet approach. By having a programme of nuclear—not just for large scale but for the future SMRs and AMRs, which will themselves use these advanced modular construction methods—we are building our capability.

There is a clear choice for the Government right now as we decide how we want to roll out nuclear. Do we want to be a country that establishes this capability and is ahead of the game? We talked about the opportunities in central and eastern Europe where we could not only be supplying our own indigenous nuclear power plants but also exporting that capability overseas. There is a clear choice. Is that the nuclear industry we want to develop, or do we want to be a net-importer and rely on international markets for the construction of our power plants, for the future fuelling of those power plants and for providing the outage services for those power plants?

Q21 **Virginia Crosbie:** You talked about your experience. There has been a lot of discussion this morning about financing. Could you please elucidate on your experience of working with other Governments, specifically across Europe: what has worked, what has not worked and what are the lessons learned, particularly relating to your fleet experience?

Barbara Rusinko: I will start, and then I think it would be good for David to weigh in.

Chair: We need to be a bit more concise in answers as we are against the clock.

Barbara Rusinko: Then I am going to defer to my colleague David.

David Durham: In Europe, I think every reactor opportunity that we have is with a state-owned entity. It is a Government policy decision that is being made to decarbonise, for energy security and even for national security in eastern Europe and they are very clear in those decisions.

If you look at our experience in the US as an example, I am the first to admit that I do not think you will see new large reactors, maybe not even SMRs, built in an unregulated energy market. Wall Street does not allow it. However, in regulated markets, predominantly in the south-eastern US, they are very supportive because they are taking the long view. They are looking at other things besides the lowest cost plant they can build today. They are looking beyond a quarter-to-quarter mindset.

I truly believe that after Vogtle is in operation, we have several other utilities in the south-eastern US that have already selected AP1000 that have not made a decision to build yet but I think they will. That is because it is a regulated market where they can put the costs of the plant into their long-term financial modelling. That is why we are very keen on RAB, because it would be a similar kind of concept. I hope that addresses your question.

Q22 **Virginia Crosbie:** It would be helpful to have an idea of your timeline. You mentioned that you will be able to contribute to the planned carbon budget 6 commitment by 2035, which is not that far away, and you mentioned the spending review on 27 October. What is happening between those two timelines?

Barbara Rusinko: We put in place the timelines in the overall structure of what has to be in place for that to be delivered. The investment in what we call in the oil and gas business a FEED, a front-end design, is really important because it helps drive other interests and investors in wanting to come to the table later. To me that is the most important piece that has to come very quickly.

Q23 **Virginia Crosbie:** What practically needs to happen?

Barbara Rusinko: Practically, I think the Government need to decide to fund it. That is the first thing. That will allow David and me to jump start taking what we have done at Vogtle already, applying it to the site at Wylfa in a FEED design. That is what will get you on the trajectory to the schedule that I think we put in our White Paper, the overall schedule of how you can get to that 2035 date.

Q24 **Robin Millar:** In the previous panel, Mr Greatrex refuted my suggestion that industry wants to have its cake and eat it and that the taxpayer must pay twice, once as the taxpayer up front with derisking the project and afterwards by taking some of the risk as a consumer. You are involved in the delivery of these things. "It is just civil engineering," I think was the phrase Dr Howarth used. It is a perfect site and it is socially well adapted. Therefore, where is the risk? Why is the price so high for Government?

Barbara Rusinko: I will take a start and, David, if you want to weigh in. It is civil engineering, but I do not want to underestimate that it is a complex build.

Q25 **Robin Millar:** Do you disagree with Dr Howarth where he said, "It is just civil engineering"? Those were his exact words.

Barbara Rusinko: I heard those words. I have been on the design and construction side of these. They are facilities that require more than just civil engineering. The risk comes not in the engineering—as mentioned, this is the fifth and sixth of a kind—but in the supply chain, labour and productivity. The added advantage of doing multiples in a country is where you start to refine that and you can get some efficiencies. To me, that is where some of the risk and the cost is: materials, supply chain and labour cost.

Q26 **Robin Millar:** Is that something Government could help with directly?

Barbara Rusinko: That is an interesting question. Where Government can help is with the certainty that projects are coming. I have found in my experience that when the workforce, the supply chain, knows there is a pipeline of work coming it is much more supportive and you get some

improved pricing. If I know I am going to buy six things, I would probably be more agreeable to a reasonable price.

David Durham: It is just engineering, it is just construction. However, one of the reasons that nuclear is expensive and how we have achieved our phenomenal safety record across the world—this is not a Westinghouse pitch, this is the industry as a whole—is because everything must be precise. The construction must be precise. This is not building a home or a factory. It requires a certain level of training and commitment.

Q27 **Robin Millar:** I do not doubt that. I know I have to pay for it, which is my question. At what point do you assume some of this risk?

David Durham: We assume substantial risk in the contracts for our equipment and our services. I do not think we are without risk at all. I think we have substantial risk. From a Westinghouse perspective, we assume substantial risk in our contracts for our equipment and our services. It is not as if we are putting all the costs on someone else. We have a high degree of confidence in our equipment and how much it costs and in the majority of our services and how much they cost. We are typically providing those at a fixed price, so from that perspective we are not putting the risk on someone else.

Q28 **Ruth Jones:** We have heard a lot about the positives of the project. If you were successful in getting Government approval, what are the timeframes from starting to construction ending and producing the power, a very simple timeframe?

Lindsay Roche: If we were successful in receiving some funding in the comprehensive spending review, we will be able to start some immediate FEED studies through years 1 and 2. That would create the conditions to attract investors and a developer, who would be able to take the project forward from thereon.

Barbara Rusinko: Once you have that and you have developed the execution strategy and the supply chain, that is where you start to do your early procurements. There is a lot of long-lead procurement items that have to be in the queue. Ivan can correct me with the right number for the years from when you start design to what we call nuclear first concrete. That is a really important milestone, because that is what sets the trajectory for delivering the plant within the timeframe of 2035. The key things are the initial FEED study, the investment and then the early supply chain for long lead, leading up to first nuclear concrete.

Ivan Baldwin: I think you covered it well, Barb. What we can commit to do, outside of Committee, is sharing the White Paper we produced. It is very comprehensive and there is detail in there. There is also a great executive summary, which brings out those key points.

Q29 **Chair:** I am sorry we are so constrained for time this morning. I will wrap up this part of the session. I am presuming there have been some

tentative conversations with BEIS and Government officials. At the moment I appreciate it is very early days, but how big is the gap that you sense between where you are coming from commercially and where the Government are at in their policy position and appetite for taking on risk and finance? How much of a gap is there to close before the stars align and a project happens in Wylfa?

Lindsay Roche: We have had really good discussions with BEIS over the last 12 months as we have explored the opportunity this project could bring. In that time we have also seen the energy White Paper and the ten-point plan come out. Nuclear is point 3 on the ten-point plan. Therefore, it is very clear from a policy perspective where this project could fit and it meets at least one large infrastructure project in this Parliament. It is clear where we are in the policy space.

We all have to recognise the challenge that Treasury has right now, post-pandemic, as we are going into the spending review. That is where we are right now. Is this a project? We are asking for a modest amount of funding to enable this project to start.

Q30 **Chair:** What does modest look like, tens of millions or hundreds of millions?

Lindsay Roche: The first one. That would enable the project to start, to start to leverage the work we are doing at Vogtle and the work we have already done in the UK and to create those conditions.

What is really important here is that this is a project that can level up the economy. This is a project that would impact the regional economy around Anglesey, north Wales, north-west England and beyond. This is not just a construction project on Anglesey; this is a project that brings so much more to the UK. It is about the UK considering how this industry can support the jobs, the skills development and the apprenticeships we talked about earlier and bring that additional value to the UK.

Chair: Thank you very much. Thank you to the whole panel. It has been very useful. Our time is up, unfortunately, so we are going to have to ask you to move aside and we will welcome our third panel. Thank you.

Examination of Witness

Witness: Simon Forster.

Q31 **Chair:** This morning we are joined by Simon Forster for the third panel, as part of our morning looking at the future of the Wylfa nuclear power station project on Anglesey. Mr Forster, you are from Shearwater. Take a very brief moment to introduce Shearwater. It is not a name I am familiar with in the energy space.

Simon Forster: Thank you very much, and thank you for the invitation to be here today. Shearwater is a start-up designed specifically for the planning and development of hybrid energy systems in the UK. We have

had experience globally for quite some time, but we felt the time was right to return to the UK and get to grips with some of the challenges that are facing the nation at the moment.

We have been active in Ireland for a couple of years beforehand, looking at a number of offshore wind projects that we are very keen on because we are believers in the development of the Atlantic seaboard for wind energy. We are also acutely aware that there is a need to couple that development with what we call dispatchable forms of energy, to ensure a high security of supply. We are acutely aware, over the last few days at least, that our wind farms in the North sea have not been producing as well as they should. When that happens we need a form of compensatory energy generation, which we term dispatchable energy. The bulk of that comes from gas. In the past nuclear has contributed largely, as has coal, but those are both in rapid decline at the moment, which places more pressure on the gas industry. When offshore wind fails, unfortunately the emissions go up and the costs go up. Our intention is to try to bring that situation down with more reliable supplies.

We worked a great deal with hydrogen and Siemens but could not quite make that work. Then we switched over to SMRs a couple of years ago and have had a very exciting time since then. We have agreements with three SMR developers, and we are looking at deployments within the UK market for those. It sounds as if there is a conflict of interest there. There is not because they are all very different products; they go from 5 megawatts to 77 to 300 so they are quite different. We are looking at the Wylfa site with two of those developers. Again, it is not conflictual at all, because they are complementary developments.

Chair: Thank you for that introduction.

Q32 **Dr Jamie Wallis:** Can you expand a little on those developments? Can you outline your proposals for the development of the Wylfa site?

Simon Forster: We see it as two sites. There is Wylfa Magnox and Wylfa Newydd, which is the subject of this Committee.

The Wylfa Magnox site is in the process of being decommissioned. We think that site is really good and, because some of the SMRs are quite small, it would be an excellent site to trial the concept of building SMR plants on an existing nuclear power site that is in the process of being decommissioned. That is what we did. We teamed up with NuScale to explore that. We have gone a considerable way to undertake a feasibility study and that is pretty much complete. We are just waiting for the final bits of that, which is the financial piece plus the construction duration. That has been held up because NuScale has had problems with their first-of-a-kind project in North America, which has been delayed and had to be rescheduled, and Covid created a number of delays. That is back on track now.

NuScale is currently looking at the development of 12 77-megawatt SMR reactors on the Wylfa Magnox site. It is aiming to generate what we call class 4 costs, which we can use in modelling. Class 5 costs have too big an uncertainty around them to generate an accurate strike price, so we require class 4. It also needs to have a very close look at the site to enable it to develop a construction programme that is quite accurate. Construction programmes are very important to get the strike price down. Too big a construction programme pushes the strike price up; if you can shrink it down as much as possible, it brings that price down. The strike prices are far more sensitive to duration of construction than they are to capital cost overruns. That is under way now and we hope this year to have some definite costs and a construction programme for Wylfa Magnox, which will produce almost 1 gigawatt of power.

I should also point out that the smaller you go in SMRs, the greater flexibility you have. The NuScale SMRs have tremendous capabilities in meeting rapid changes in demand and changes in renewables as well. They are a great complement for renewables.

From the perspective of your previous speakers, everybody talks about nuclear in general as an energy source. However, it is a bit like comparing a family hatchback that runs on diesel with a 30-tonne diesel truck. They run on the same fuel but they do very different things in meeting requirements. Smaller SMRs are more about flexibility, demand fluctuations and complementing renewables. The big nuclear power stations are baseload, and they do not change very much.

Chair: Sorry, I am conscious that time is very short, so we are going to have to speed up questions and answers, if that is okay.

Simon Forster: Once we announced we were looking at Wylfa Magnox, we were approached by GE Hitachi to look at the development of the Wylfa Newydd site with a view to deploying their BWRX-300 SMR reactor. That is a multiple SMR proposal. We have completed that work and have submitted a proposal to GE Hitachi in the US for consideration. We have also submitted the preliminary cost estimates to BEIS and the Treasury, and those are undergoing due diligence evaluations as we speak.

Q33 **Virginia Crosbie:** Thank you for coming to present this morning. You are talking about an awful lot of different projects, and I know you have your offshore wind as well. We had Bechtel and Westinghouse before, and they were represented by a whole panel. Why are you here by yourself? Why is NuScale not sitting next to you?

Simon Forster: I drew the short straw. The projects are at a very sensitive and delicate stage at the moment. You have a colleague, Declan, coming from BEIS afterwards. It is really in the balance. We have not progressed our planning work as much as we would like. We need to do a lot more. On some of the issues you raised about finance, the devex finance is a problem, the finance you use for development. It spans a critical date, which is the final investment decision date. All expenditure

on a project before then is very high risk. We have already discussed the problem of accessing finance for nuclear power. It is very expensive, it is very high risk and not very many people will fund it.

Q34 **Virginia Crosbie:** How do you hope to get the land off Hitachi?

Simon Forster: With great difficulty. I proposed to go and speak to Hitachi some time ago, and I was told that they probably would not be too inclined to speak to me if I mentioned the word "Wylfa". We rely on our colleagues in the US, GE Hitachi, to broker that and hopefully to present an opportunity to them. It is for 10 BWRX-300s. It only takes a small portion of the land. Even though we are talking about 10 reactors, it is a very small portion of the Wylfa Newydd site. It still leaves a lot of opportunity for other developers to come onsite.

The only thing that really restricts Wylfa Newydd as a site for nuclear power generation is its transmission capacity, and that can easily be overcome via a coastal HVDC loop to Deeside. Therefore, the sky is the limit for Wylfa. You have heard from previous speakers that it is an excellent site, it is one of the best. We are currently looking at over 40 potential sites in the UK for SMRs, and this is definitely No. 1 on the list.

Q35 **Ruth Jones:** You have said that the project has various aspects. With your proposal, do you have any concerns about the project and the risks involved?

Simon Forster: Yes. The risk, as you know, is tremendous. First of all, we are dealing with a technology that has not been built yet, and I make no excuses for that. We are not intending for Wylfa to be home to any first-of-a-kind development. I tried very hard to bring developers to Wylfa to develop a first-of-a-kind reactor there, but there was no interest in that. Everybody is focused on Canada at the moment, which has rolled out the red carpet to the nuclear industry. We will be dealing with a nth of a kind. These will be reactors that are built following operational reactors built elsewhere in the world, so that dissipates the risk but still it is the first of a kind in the UK. At the moment our biggest problem is dealing with that early-stage risk.

Say you had two nuclear options, a 1,000-megawatt single conventional reactor and three 300-megawatt reactors, on the 1,000-megawatt reactor your risk would exist from the day you put the spade in the ground. You have that risk until you switch it on and commission it. That might be 10 years, so it is a lot of capital over 10 years of risk. When you build three SMRs, the risk applies to just the first one and that is a period of approximately 36 months. It is a greatly reduced risk, so that brings the cost of the finance down. Once you have that first reactor working, every one you build after that is what we call a production-line facility, it is tried and tested, your construction teams know what to do, your supply chains are in place, are working and streamlined and you have overcome all the issues, so the risk dissipates.

Therefore, the risk is only on the first reactor in a multiple-SMR development. That makes it much more palatable, but it is still a problem getting finance for that first reactor. This is where we would like to access the RAB model for that first reactor only, or perhaps the first three and then the remaining seven could be dealt with adequately by private sector finance.

Q36 **Ruth Jones:** Are you saying that a small modular process is less risky than a big one?

Simon Forster: Far less risky, and it has the added advantage that the minute you switch the first one on it is generating income and that is reducing your capital needs, your need to borrow, for the remaining ones. By the time you get up to the ninth one, you have so much revenue you do not need to borrow for the last one.

Q37 **Ruth Jones:** Assuming everything goes well, there is a fair wind and all the rest of it and you get your permissions, what are your timescales?

Simon Forster: First spade in the ground 2025, pouring first nuclear concrete late 2026, early 2027 at the latest. Hopefully—with, as you say, good winds—we will have first power 2028, and then the final reactor would probably go in about 2035-36, so we would commission one every 12 to 18 months.

Q38 **Chair:** Have you been consulting any groups on Anglesey? Have you spoken to any of the local stakeholders involved, mindful of the delicate balance of local opinion and that they have been around this mountain before?

Simon Forster: I am acutely aware of that. The way expectations have been raised and dashed, I am very wary of that. We maintain very close contact with Virginia here. Also, we have had discussions with the local councils on Anglesey and with some Members of the Welsh Parliament. That is the primary line of communication, but we have kept it very low key because, at the moment, it really depends on decisions. Decisions depend on price, as we see it, and those decisions have not been taken. It requires people like NuScale, GE Hitachi, Her Majesty's Government and of course the pension funds, which are keen to invest, to come together to take a collective decision and say, "Yes, we will go with the project and it will look like this."

Q39 **Chair:** Are you discussing the project with pension funds?

Simon Forster: Yes, we have a group of pension funds that are very keen to invest in SMRs at the moment.

Q40 **Chair:** Are they UK-based or are they overseas?

Simon Forster: They are UK-based, but they are international. They are big.

Q41 **Chair:** Are you speaking to the Welsh Government as well?

Simon Forster: We did inform them. We received a letter back, but we haven't had any direct communication with the Welsh Government. We have spoken and had meetings with groups of Welsh MPs.

Q42 **Chair:** I am going to be honest here, I started off the day kind of sceptical because I have been around this mountain before with Wylfa. I went through the Horizon experience and I was a Minister in the Government at the time. We seemed to run into a wall of problems and difficulties in making a nuclear project happen at Wylfa. We have just heard from Bechtel and Westinghouse about their plans, and there was some frank acknowledgement about how difficult some of the challenges will be ahead. Playing devil's advocate, why should the UK Government take a punt on you and your company to do this?

Simon Forster: The simple answer is cost. I can give you a whole range of other reasons and the general corporate rhetoric. I love the one that GH have, which is "simpler, safer, smaller." It is also very cheap, but with SMR technology I would discourage people from comparing it with the conventional nuclear technology that we currently have being built at HPC and potentially at Sizewell. As I said, it is a totally different game.

SMR technology is a replacement for gas. If you can envisage a conventional gas plant that provides electricity today, with three, four, five gas turbines, maybe two steam turbines, that is what we are replacing. We look at the cost of gas, without carbon taxes and with carbon taxes, and we say, "We have to replace that. This is part of decarbonisation of the grid and this is the bit we are going for," so we are not looking to encroach on the baseload market of the big nuclear power stations. We are looking to replace gas. With this particular development at Wylfa, we will be looking to decarbonise the north Wales and north-western grid by about 2035, completely.

Q43 **Chair:** Can you give us a flavour of the discussions you have already had with BEIS?

Simon Forster: BEIS gave us an informal price channel to work with. It gave us two guidelines: an informal price channel, which was £45 to £55 at 2012 prices per KWh, and I can safely say that we are comfortably within that channel. The second thing BEIS gave us is that it said it wanted maximum private sector finance, minimum public sector finance. We have achieved both, but we still have the problem of the management of initial risk, which is where we think the RAB would help us on the initial units but not after that.

Generally, we have regular dialogue with BEIS and with Treasury, almost monthly now. It is going very well. We have met the challenges they have set us adequately, and we are keen to do more business with them. If we don't get the Wylfa site, we have a lot of others in the country. We have three current projects ongoing, one of which is extremely exciting.

Q44 **Chair:** Are those in the public domain, Mr Forster?

Simon Forster: No, they are not, and I would love to tell you about it.

Chair: We would love to hear about it.

Simon Forster: Hopefully it won't be too long before I can sit here and tell you about them.

Q45 **Chair:** To be clear—because you talked about your expertise in other areas of the energy industry—you are talking here about nuclear projects?

Simon Forster: These are projects employing nuclear SMR power in a hybrid context for decarbonisation of industry and the grid, yes.

Q46 **Chair:** So, nuclear reactors?

Simon Forster: Yes, small scale.

Chair: That is what I was getting at. Time is pressing on. We have one more panel to do. Thank you very much, Mr Forster. We really appreciate your time. As and when your business is able to release more information to us as a Committee, we would love to hear from you again.

Simon Forster: You are very welcome.

Examination of Witness

Witness: Declan Burke.

Q47 **Chair:** Good morning. We are joined now by Declan Burke, who is director of nuclear projects and development at BEIS. Mr Burke, we are very grateful for your time. You are our fourth panel this morning. We have had a busy and very full morning, looking at the future of the Wylfa nuclear power project site, testing some of the appetite for development there and hearing a bit from industry representatives about what happened previously under Horizon.

I will start the questions by asking you to give me your assessment of what went wrong with Horizon and where the potential is at the moment for keeping the site alive.

Declan Burke: Thank you, Chair, and thank you for the invitation to join this session today.

It was clearly a matter of huge disappointment for all of us who had been working on the project for a number of years that we could not get it across the line and commercially we could not find the landing point for Hitachi Horizon to proceed. There were a number of lessons. One that has come through loud and clear from your session today is what a good site Wylfa is for the development of a nuclear power project. There was a lot of work done by the Hitachi Horizon team looking at the site, and that came through clearly.

I think the Government made a lot of potential support available through the negotiation for the project. As the then Secretary of State said, we were thinking about a one-third equity stake underwriting the debt financing and providing a contract for difference for 35 years up to a price of £75. Despite that significant level of support, we could not find a commercial landing point that would have worked for Hitachi.

I point to two buckets that we took from those things to reflect on. One is the challenge of financing nuclear power. Nuclear power has huge advantages for the energy sector, a 60-year long life asset, low carbon power, but to get there you have a pretty long build period of about 10 years, so financing the way through that level of construction, with relatively high up-front costs—*[Inaudible.]*

The second point is making sure we think about who is developing the site, who is doing the reactor vendor technology, supplying the technology, and who is building off the developed capabilities to bring the site through to the construction phase. You have different people who do different things in the market. Some are experienced to do that sort of role, whereas some people are more familiar with selling reactor technology and making sure you have the right consortia together to bring projects through.

Q48 **Chair:** In January 2019, when the Secretary of State at the time, Greg Clark, made the statement to the House of Commons that effectively signalled the end of the road as far as Horizon was concerned, was it the assumption within Government from that point that basically the door had now shut on Wylfa?

Declan Burke: As described at the time, it was the suspension of the project and you may recall Hitachi Horizon was continuing with its DCO or its planning application. I think at that point it was being suspended rather than completely terminated, so the door had not completely closed. Subsequently, it did withdraw that DCO application, but I think at that point the suspension of the project was clearly what Hitachi Horizon was communicating. Clearly, it was a very significant hit to the project. The team was being wound down and it was losing the capability and resource. It had very experienced capability in Horizon in the UK, including quite a number of local, experienced executives, so we were losing that capability, but it was a suspension back in January 2019.

Q49 **Chair:** We have heard this morning—and hopefully you had a chance to listen in on the earlier sessions—from two groups of potential developers about their interest in the site, both of whom alluded to discussions or conversations they were having with the Department. From the departmental end, are you able to give us a sense of the level of intensity, seriousness or progression of those discussions?

Declan Burke: As per the ten-point plan and the energy White Paper, nuclear is a critical point of our net zero and carbon budget ambitions. We have signalled that we are looking to take a final decision on another

nuclear project in this Parliament. We have activity around small modular reactors as well. You will be aware that we are in negotiations with Sizewell C. That does not preclude us from having discussions with other potentially interested parties as well. We have very regular discussions with the consortium you heard from on the AP1000 and, as Mr Forster mentioned, we are speaking to Shearwater as well.

I characterise them as exploratory. They have brought forward potential proposals for developing the site. Some of the things I talked about in the make-up of the consortia, their experience, what their proposal is for financing, understanding better the propositions is how I would describe the conversations at this point.

Q50 **Chair:** Have any of those discussions involved Treasury colleagues, or is it purely a BEIS conversation at the moment?

Declan Burke: I characterise the conversations as being led by BEIS within the nuclear team. We have a very close relationship with our Treasury colleagues. Clearly, anything to do with nuclear can have significant spending implications, but I would describe the conversations as being led from the BEIS side.

Q51 **Robin Millar:** When you say it is being led by BEIS, does that mean you conduct the conversation and report to Treasury or does it mean that Treasury has equipped you with a figure, a budget or a sum in mind and you operate and negotiate within those parameters?

Declan Burke: Given their exploratory nature, there is not a defined budget or anything at this stage. We just want to understand from the consortia what they have in mind, what they think is needed, how they reflect on some of the lessons. We are very interested, for example, in the progress on the AP1000. That project had some earlier issues but seems very much on track now. In any event, we are always interested in listening to what is going on with international projects.

Q52 **Robin Millar:** I made a point of pressing previous witnesses on the taxpayers' perspective. As members of this Committee, although we are not in the Government—we are not the decision-makers in Cabinet and the Ministries—we are custodians and representatives of the taxpayers in our different constituencies and across Wales. How much does that perspective feature in the day-to-day conversations or is it lost in the big budgets and lots of zeros, the types of numbers that we imagine must be flowing around in Treasury?

Declan Burke: That is an important point. It is very front and centre of our mind, as custodians of public money. Either the taxpayer or the consumer will ultimately be paying for these nuclear developments. Although we put in a very significant package of potential support with the Hitachi Horizon project, there was the point beyond which Ministers were not willing to go, despite us all very much wanting that project to work. We think nuclear is a critical part of net zero. We are looking at

models, like the regulated asset base for example, but it needs to work from the taxpayer and consumer perspective as well.

Robin Millar: Thank you, and strength to your arm in that.

Q53 **Ruth Jones:** I have lots of questions on how you relate to the projects, and I suppose one of my biggest ones is on the green agenda. There is a finite number of construction workers. We have heard very clearly lately about the limits in actual workers able to do jobs. Construction workers are at Hinkley, they expect to move on to Sizewell, but on the project timelines for Wylfa, are you confident that there will be the construction workers available for it?

Declan Burke: That is a really important question, and it is one of the things we want to understand a little bit more from the projects themselves. Visibility of the supply chain is critical. I was down at the Hinkley Point site, for example, during the summer, and maybe one of the positive impacts of the pandemic is that it sourced more and more locally, including from Wales and Welsh steel. That is the sort of thing we want to encourage, moving across to Sizewell if we end up taking that project forward.

How you phase what can be very significant and big projects in a way that you don't have a feast or famine for the supply chain is really important. In any decision around any nuclear project, including the ones that appeared earlier in your session, the question of phasing is really important. Going back to the previous point, the question of consumer bills and paying for these things is important as well. There would be a round look at the project itself, how it fits within the supply chain and then how it fits within wider energy policy.

Q54 **Ruth Jones:** In Newport West, I know that for the workers from my patch who work at Hinkley it is a very easy commute. Yes, I get that entirely.

Given the failure of the previous Horizon scheme, have you reassessed the level of subsidy and equity support? Have you looked at how you can best support that with as little risk to the taxpayer as possible?

Declan Burke: Yes, we have. One of the key things we have taken away from the last Wylfa project was the approach to financing. A key challenge is that we were using the contract for difference mechanism, which was the approach taken to Hinkley Point, although we were potentially providing Government financing as well. That instrument works really well for renewables and some of these things that are a bit faster to build. One of the learnings is that if you are spending much longer in construction and you are not getting any return during that period, it is very challenging for projects to raise the required financing.

That is one of the reasons we are looking at this regulated asset base. We consulted in 2019. We responded at the end of last year, alongside the energy White Paper, saying we think it could be a good way of

financing a nuclear power plant. Going to the previous speaker, calibrating the way that allows us to raise the financing gives confidence to investors, but it protects taxpayers and consumers as well.

Q55 **Dr Jamie Wallis:** How much importance does BEIS attach to attracting private investment in the development of new nuclear power stations?

Declan Burke: Critical. I think it is really important. The private sector brings a level of discipline and diligence to the project. If you look at major projects internationally, best practice says that the private sector plays a key role in protecting taxpayer projects at a sufficient level of maturity and due diligence to move forward and to benefit from taxpayer or consumer support. Whatever way you finance this, ultimately consumers are paying for the electricity, so private finance is an important part of it.

That is one of the reasons we are looking at this regulated asset base approach, which is used to finance things like networks and other long-life infrastructure assets. We spend quite a bit of our time speaking to financial institutions that are keen to invest in low carbon technologies about what sorts of instruments can mobilise their finance into projects we need, like new nuclear power.

Q56 **Dr Jamie Wallis:** What is your assessment of whether the RAB model has the potential to reduce consumer bills?

Declan Burke: Yes, I think it does have that potential. The NAO report on Hinkley Point encouraged the Government to think about future projects: is there a potential rebalancing of the CfD model where all the risk would sit completely with the private sector all the way through the build period into the operational period? Is there a rebalancing along the lines of something like the regulated asset base, which you are probably aware is used for other projects? We recently saw it being used for the Thames Tideway, a big infrastructure project in London.

A big component of the total cost of what consumers ultimately pay for nuclear power is the cost of capital. There is a lot of up-front capital expenditure over an extended period and then a very long-life operational asset, so it is potentially a way of lowering the cost of capital, which has a big impact on the cost of nuclear power.

Q57 **Dr Jamie Wallis:** What is your response to concerns that have been expressed that the RAB model could result in overrun costs being passed on to consumers?

Declan Burke: There are a number of things there. One is clearly making sure we do due diligence and understand the project before there is any commitment to provide it with the regulated asset base approach. I think that is very important. The role of private sector finance—going back to your first question—is an important part of that as well. It is understanding the project in a lot of detail and then checking the calibration of the risk and reward. Investors need to be incentivised

through the regulated asset base structure to manage the project in the right way, so we are focusing on some of the tail risks that investors struggle with. We think the calibration of that is really important, and that is what we are working on as a Department at the moment.

Q58 **Chair:** Staying on the theme of the regulated asset base model, if that had been in use in January 2019, would the problems around financing and risk that Secretary of State Greg Clark outlined on the Floor of the House of Commons as to why the Wylfa project was being put on pause have melted away?

Declan Burke: It is an interesting question. It is hard to answer that precisely. One of the challenges we had was that Hitachi, as a private sector company, was carrying a lot of the load for the project on its balance sheet and that the nature of the CfD was making that challenging—no returns for a long time during the construction period. It is certainly an area in which we were finding challenge. The answer is that I don't know whether it would have solved it in its absoluteness. Hitachi in Japan traditionally sells its reactor technology to utilities with a consortium that manages the construction. I think Hitachi found that it was needing to build up a lot of capability in the UK market, which was a relatively new role for it. But definitely the approach to financing is one of the things we took from the last exercise at Wylfa.

Q59 **Chair:** Are you aware of whether there has been any attempt to rekindle interest on the part of Hitachi since January 2019? Has there been an ongoing campaign to keep it talking at least, or is there a recognition that Hitachi has parted company on this particular project?

Declan Burke: We certainly have regular contact. Obviously Hitachi is still the owner of the site, so we want to maintain a constructive relationship. It is a great site for any future development. My understanding—and I am not particularly close to its corporate strategy—is that Hitachi is moving into different areas and has bought some big businesses, a network of management businesses in the US, for example. My expectation is that as a corporate strategy it is moving in a slightly different direction.

Q60 **Chair:** I absolutely concur with your earlier comment about the boost to employment in Wales from the Hinkley Point project and I was interested to hear Ruth's comment about her constituents. Even from my own constituency in far-flung west Wales, three hours away from Hinkley, a number of our local firms have secured contracts there and a lot of Pembrokeshire men and women have secured employment through those projects. It demonstrates, when you have these enormous, really big scale projects, the boost that they can provide throughout the supply chain and the whole nation of Wales.

Declan Burke: Definitely, and high-skilled, productive jobs. When I was down there there were some really skilled jobs in fabrication, welding and so on. Yes, highly productive jobs.

Q61 **Chair:** Hinkley Point involves a significant Chinese component, and when I visited the site I saw that and discussed it with the team there. Does our current posture towards China make it more difficult to resurrect a project at Wylfa? How is that changing the calculus towards new nuclear build?

Declan Burke: I suppose any kind of project will have to comply with the legal, regulatory and national security requirements, and everything will be looked at robustly. I am not sure that it will provide a massive impediment to the nuclear programme as we envisage it. As you rightly said, they are an important part of the Hinkley Point project, but I don't think it will have a particular bearing. Any project will be reviewed, as I say, from a regulatory and national security perspective at the time.

Q62 **Chair:** Earlier this morning we heard Shearwater talking about SMR technology and Westinghouse and Bechtel talking about the technology that they deploy. Are the Government neutral about different nuclear technologies or, when it comes to Wylfa, is there a clearer idea in mind of what kind of nuclear power station should be there, if any?

Declan Burke: The current approach is as per the ten-point plan. We are progressing both. We think it is a kind of "and" situation as we sit here today. The Committee is probably aware that we will have a lot of our nuclear reactors—all but one—retired by 2030. We hope that Hinkley Point, and then ultimately Sizewell B, sequences us back to where we need to be. We need to progress and keep the gigawatt pipeline going.

We think SMRs are a very exciting opportunity, probably in the 2030s timeframe. Does the modularisation make the financing easier, for example? We are keen to progress discussions on modular reactors as well and, indeed, advanced modular reactors. We have put a consultation out on that recently. We are progressing with both, rather than one or the other, at this point.

Q63 **Robin Millar:** I am intrigued by the RAB model. The point I made in previous panels—and I don't know if you were online at the time—is that there is a sense of "have your cake and eat it." The taxpayer is the consumer, and there is a double bill to me as a taxpayer and then again when I pay my energy bills. Are we locked into this model? Are there other discussions about alternative models? Are the Government open to considering other models of finance?

Declan Burke: We suggested a consultation response. We think this could potentially be a good way, if you think about the characteristics of nuclear, this kind of very long build period. In our feedback from investors, it seems to be the sort of thing that can unlock and mobilise private capital. To your core point, there are a number of important things you would want to do to make sure that, in any application of RAB, the consumer and the taxpayer are sufficiently protected in that environment.

That is why it is very important to understand individual projects. What skin are they putting into the project, real money at risk, and are they incentivised if the project goes across the line? That is very important. Then there are developer capabilities. We almost need to act as investors when we think about applying RAB, because it is ultimately consumers' money. In designating any project at the right time, being confident about the level of maturity and the level of skin in the game from other participants in the consortium is important.

If we compare some of the challenges on the contracts for difference, it was one of the lessons from Wylfa. We were struggling to entice private capital. Nuclear does so many great things in our system when it is up and running, but there is this long construction period that we need to reach across. We think RAB could be a good way of doing that, but we need to think about having the right incentives on private capital, and private capital is an important part of the solution.

Q64 **Robin Millar:** My final comment is that I know the RAB model has been criticised for removing all risk from the developer against nefarious or wobbly promises of benefit in the future, I think that was the phrase used by one academic. It was very interesting to me when Bechtel said that it saw its risk as being in the supply chain, and then I think the gentleman from Westinghouse said that its sunk costs were in equipment. It is really interesting that this is essentially negotiation, as you appreciate, and I wonder what concessions we get back from them. If this is something that the Government are going in with, it is a concession that we are making up front. What benefit do we receive from making that concession?

Declan Burke: There is an interesting point about that particular project, Westinghouse brings its vendor capability in the—*[Inaudible.]*

Chair: We should perhaps suspend proceedings and see whether we can get Mr Burke back.

Sitting suspended.

On resuming—

Declan Burke: I was just mentioning that, as part of our preliminary exploratory discussions and looking at the proposals that are being brought forward, one of the things we would like to understand is what is the nature of the consortia and what risk would the consortia be taking that would give us confidence in the project. Those are the sorts of discussions we would have with anybody who brings forward a proposal.

Q65 **Ruth Jones:** Going back to something you said earlier about commissioning new developments, you mentioned that our old reactors are creaking at the seams and we have Hinkley and Sizewell coming on. Are you anxious at all that there could be a gap in supply and, therefore, the lights could go out?

Declan Burke: No, I would not say that we have any concerns about security of supply. We have a very resilient system in the UK. It is worth saying that nuclear is one of a number of measures we are working on for low carbon power. We have a 40 gigawatt target by 2030 in offshore wind, for example. We have commitments around carbon capture and storage and power from carbon capture and storage.

There are quite a lot of other things going on in the energy system, but nuclear is going to be an important part of that. Especially as we think about going through the 2030s into 2050, we will see an increase in demand for electricity in sectors like heat and electrified transport. There are no concerns about security of supply but a steady pipeline of nuclear build is an important part of the road to 2050.

Q66 **Ruth Jones:** With the benefit of hindsight, for projects to run smoothly it would have been good to have started this several years ago.

Declan Burke: As I sit here today, the key thing is that we have activated the new build pipeline with Hinkley Point and we have talked about the supply chain, all the things that we are learning. We need to keep those learnings as we transition, and that is so important for nuclear. I know, for example, when they started building in the US after losing that experience of building, they had a challenge when they came back to it again. I think a steady forward build programme is important.

Q67 **Chair:** Coming back to the regulated asset base, how many could be done at any one time by the UK Government? Is there an issue around the capacity to manage a number of these major projects concurrently through that model?

Declan Burke: That is a consideration. I can't give you an accurate answer today, but I think we would be considering things like market capacity. These are significant capital programmes. Also, critically, there is the impact on consumers. One of the things we would be thinking about is: what does the phasing look like? What does that mean for consumers, market capacity and supply chain support? Those are the sorts of considerations we would be thinking through.

Q68 **Chair:** We are coming to a close now, but obviously this week has been dominated by discussions around gas prices and gas supply, what is going on in world markets and how that is impacting on consumers here in the UK. Does any of the debate around that change the equation at all in how nuclear might be viewed within Government? I keep coming back to January 2019 and the statement from the then Secretary of State, Greg Clark, when the Wylfa project was put on pause. How much has changed in the world of energy and climate change policy that changes the paradigm for whether new major projects should happen?

Declan Burke: We have a couple of considerations. For example, our 2050 net zero ambition is a big thing in the role that energy and electricity is going to play in meeting that objective. I think that is important.

We put out some analysis alongside our energy White Paper at the end of last year that says, "For sure, our system is probably going to be based on low-cost renewables." There is a lot of uncertainty, but if you model thousands of different scenarios you get some common features, the majority of renewables, a lot of flexibility and storage, but you need sources of firm low carbon power and we think nuclear is a critical part of that mix.

Given our net zero ambitions, we think a pipeline of nuclear activity is critical and, as the Secretary of State—who appeared in front of Parliament and the BEIS Committee yesterday—made clear, we benefit from a diverse range of sources of electricity in the UK, which adds to the resilience of our system. I mentioned 16% from nuclear in 2020. Keeping nuclear as part of our system is obviously a very good thing for a diverse security of supply as well.

Chair: Great. Thank you very much. There are no further questions or supplementaries from my fellow Committee members. That just leaves me to say a huge thank you to you, Mr Burke, for your time. You have been a superb panellist, so thank you very much. To all of our previous panellists throughout the morning who have helped us with this rather complicated and challenging subject, thank you.