



HOUSE OF COMMONS

## Welsh Affairs Committee

Oral evidence: [Nuclear energy in Wales](#), HC 240

Wednesday 16 November 2022

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[Watch the meeting](#)

Members present: Stephen Crabb (Chair); Simon Baynes; Virginia Crosbie; Geraint Davies; Ben Lake; Rob Roberts; Beth Winter.

Questions 42 - 95

### Witnesses

**I:** Julia Pyke, Director of Finance and Economic Regulation, Sizewell C; Darryl Murphy, Managing Director, Head of Infrastructure, Aviva Investors; and Tom Greatrex, Chief Executive, Nuclear Industry Association.

Written evidence from witnesses:

- [Sizewell C Consortium](#)
- [Nuclear Industry Association](#)



## Examination of witnesses

Witnesses: Julia Pyke, Darryl Murphy and Tom Greatrex.

**Chair:** Good morning. Welcome to this session of the Welsh Affairs Committee, where we are continuing our inquiry into nuclear energy in Wales. We are delighted to be joined this morning by three experts from the field who are going to help us with our discussion: Julia Pyke, who is director of finance and economic regulation at Sizewell C; Darryl Murphy, who is managing director and head of infrastructure at Aviva Investors but is appearing this morning in a personal capacity, rather than on behalf of Aviva; and Tom Greatrex, who is chief executive of the Nuclear Industry Association. I will ask my colleague Simon Baynes to open the questions.

Q42 **Simon Baynes:** Thank you very much indeed for attending this morning. The first question we want to focus on is, what needs to happen to ensure that Wylfa will be the next new large-scale nuclear plant after Sizewell C? I will put that question to Julia Pyke first.

**Julia Pyke:** The first thing that needs to happen is that the Government needs to decide—together with GBN, in the role that has been developed for Great British Nuclear—that it wants a second gigawatt project after Sizewell C. We need to get Sizewell C over the line, we need to keep the momentum in the programme, and then there needs to be a decision that there is going to be another gigawatt nuclear plant. If there is going to be another gigawatt nuclear plant—as Virginia knows, as well as most people—Wylfa is an excellent site for it. There needs to be that decision.

While that decision is being taken, you need to select your technology. There are arguments as to why that should be a UK EPR. Fleets are quite often built in sixes. When the CEGB in the 1980s and 1990s was putting together the Sizewell B existing pressurised water reactor and had a programme, it was going to build two at Sizewell, two at Hinkley and two at Wylfa. So we would be returning to the programme that had existed before nuclear new build stopped after Sizewell B in the 1990s.

Once there is a decision that you want another gigawatt reactor and that it should be at Wylfa, and having decided on your technology—is it to be a UK EPR, a Westinghouse reactor or some alternative—then you need to go through planning. Obviously a lot of work was done by the Horizon project on planning, and I think the issues are known—the pros and cons and what to look at in the planning. You then need to do all the engineering work to build your reactor on that site, and then you need to raise the money. This is where Sizewell going ahead is hugely helpful to the programme, because Sizewell C will demonstrate the benefit of the Government's policy in introducing the regulated asset base model. There is a clear way of financing, and people will no longer have to say, "But how will it be financed?" because we will have a template.

Q43 **Simon Baynes:** Just to scroll back to what you said initially about Sizewell



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C, and for those of us who are not nuclear experts, could you tell us what the situation is there at the moment, given that you are saying that Wylfa is contingent upon that?

**Julia Pyke:** Sizewell C is an above-ground copy of Hinkley Point C. It has been in development for eight years or so. It has most of its major consents. It has its development consent order, for example. We are waiting for the Government to decide to go ahead with designating us as eligible for a regulated asset base licence, and we are waiting for an announcement that the Government have decided to take half the shares in Sizewell C, which has been well trailed in the press. Then we will have a clear programme of raising the money to achieve financial close in the next 12 to 18 months. Once the success of that mechanism is demonstrated, there is a clear template for building an additional gigawatt reactor.

Q44 **Simon Baynes:** Just to finish off on that subject, what is your best guess as to when that decision might be made on Sizewell C? Do you have any sense, or is it impossible for you to say?

**Julia Pyke:** We are very much hoping to see a supportive statement included in the Thursday financial statement.

Q45 **Simon Baynes:** Tomorrow. Okay, that's great.

I am just going slot in with this, and then I will come to Tom and Darryl and ask them the same double-question. How promising is the prospect that Trawsfynydd could be the site of the UK's first SMR?

**Julia Pyke:** I am not an expert in the particular qualities of Trawsfynydd, but I am a believer in the SMR programme. I know that people have been looking at Trawsfynydd for a long time. In so far as I am aware—Tom will have a better-informed view—it is spoken about as being a very good site indeed for that.

Q46 **Simon Baynes:** That is the perfect link to Tom Greatrex. Could you comment on Trawsfynydd and the Wylfa question?

**Tom Greatrex:** Sure. Trawsfynydd is one of a number of sites that are ideal for SMR in the sense of their size and characteristics, so there are SMR technology vendors that are interested in Trawsfynydd as a potential site. However, we have not had a siting process for SMR yet. Julia referred to Great British Nuclear, which was announced by the Prime Minister before last when the energy security strategy was published in the spring. What has happened with that is that there was a group led by an industrial adviser that produced a report for the last Prime Minister on her first day.

As for the things that need to be done with GBN, we are waiting for GBN to be announced. That is quite integral to establishing a programme that Julia referred to, because if you have a programmatic approach, all the things you need to do, including siting processes for SMR, can then happen in a consistent way to get to up to 24 GW, which is established in the energy security strategy.



Those two things are linked, because we do not yet have any sites designated for SMR in particular and that will need to happen. My understanding is that Trawsfynydd is a site where there is quite a significant degree of local support. It has obviously had nuclear facilities before, and I think it is likely that the first SMR will be on a site or adjacent to a site where there is either an existing or previous nuclear facility.

**Q47 Simon Baynes:** Again, it is an unfair question, but how likely do you think it is that the decisions will be made by the Government to enable this?

**Tom Greatrex:** The course of the last few months has certainly helped to focus minds on the realities of the energy security challenges that we face as a country. I think that has certainly helped there to be much more clarity and urgency about the need for these decisions. I would anticipate that over the remainder of this month, we will get some of those decisions. Frankly, if we do not, we are putting in jeopardy the ability to get anywhere close to achieving the energy security strategy prognosis of up to 24 GW by 2050. 2050 sounds like a long time away, but it really isn't if what you are trying to do by then is to have a secure, reliable decarbonised power supply.

**Q48 Simon Baynes:** We will come to questions about Wylfa next with Virginia, so I don't know whether you want to comment on Wylfa or leave it until the next bit.

**Tom Greatrex:** All I will say on Wylfa is that it does not matter who you talk to; everybody recognises that it is a very strong site for nuclear development. There have been, at various points, a whole number of people interested in it. The question will then be: why has nothing happened, and why have people on Anglesey been led to expect that things would happen that did not happen? Fundamentally, the reason for that is that the policy framework has not been put in place yet. If some of the things that Julie and Darryl refer to are in place, the attractiveness of the Wylfa site becomes very significant to where the next large-scale reactor is likely to be.

If you are talking about 24 GW by 2050, it is not a choice between having gigawatt scale and SMR; it is about both. Different sites are more appropriate for each, and we will need to do a lot of work over that period to get to that 24 GW.

**Simon Baynes:** Thank you. Darryl, on the two questions of Wylfa and Trawsfynydd—

**Darryl Murphy:** Perhaps I have an easier task, because financial investors are notoriously patient in waiting for opportunities to arise. The thing to stress up front—I think I can generalise across the financial investment community—is that hitherto there has not been an opportunity around nuclear, and yet you have a body of investors more broadly who have committed in various shapes and forms to investing in net zero and energy transition. The financial community is very engaged on any technology that is being taken forward, and frankly it is probably the No. 1

opportunity for financial investors in the UK today, by which I mean across a range of technologies.

In terms of nuclear to date, there has not really been the opportunity to invest. I am sure Julia will confirm that engagement on Sizewell C has been occurring with the financial community on and off for probably at least five years. There is a danger that financial investors are not looking at nuclear for nuclear's sake; they are looking at investments that work from an energy transition point of view, so they need to be shown the opportunity or, frankly, they get bored very easily, and they can go on and do other things.

To Tom's point, what is really important is a programme. At the moment, the only thing in the near-term horizon—excuse the pun—is Sizewell. That is a very important opportunity, and I think we have to recognise that there is a degree of coupling, to the point that if Sizewell is a success, it will breed success going forward. If we look at Sizewell, a question you will get asked is, "What is coming next? Why should we spend all this time looking at nuclear for one project—it is very large and very viable, but what is going to happen then? Is this going to be a single project and nothing else, and are SMRs going to happen in the near term?"

I think it is very important to provide that programmatic view for investors so that they can see it is worth putting in the time and effort, because it is a sector they have not looked at before. At the moment, the learning curve will be on Sizewell C, and success will breed success. If Sizewell C is derailed, it makes it even harder for Wylfa to have a chance to get the investment. A lot of investors will say, "I have spent years looking at nuclear and it never happens. Why am I going to look at it all over again? There are many other places to put my money."

That is the point I would make on this. At the end of the day, any investor will look at the opportunity in the very near term. On all those steps that Julia has set out, most investors will say, "Come back to me when you have completed that, and then I might take it seriously."

**Simon Baynes:** Thank you very much. Back to you, Chair.

Q49 **Chair:** I will bring in Virginia in a moment, after a couple of supplementary questions from myself and Rob. Taking one step further back and looking at this in an even more general sense, I recall the comment from Boris Johnson when he left office at the end of the summer: "Go nuclear and go large", I think was his advice.

**Julia Pyke:** At Sizewell C!

Q50 **Chair:** Does it feel like the current iteration of this Government are going nuclear and going large, Julia?

**Julia Pyke:** This Government in general have made some very positive policy. We have made more progress in the last couple of years than in the previous decades, because previously only Hinkley Point C has been built, which is a fantastic project and is reviving the supply chain. In terms



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of policy for getting another under way—other than on the balance sheet of another state—recently it is this Government who have put forward the policy to enable that.

As Darryl said, programme is so important. When we are talking to investors, it is not just programme for nuclear; it is also programme for the technology. If investors are going to look at investing in Sizewell C, they have to understand the UK EPR technology. It is obviously easier to raise money for another reactor of the same type because you have a pool not only of investors, but of all their intermediaries and advisers, who have looked at that technology. It is not existential, but it is a much easier sell. So do we remain confident in this iteration of this Government? Yes.

**Q51 Chair:** Tom, there was a press report, wasn't there, earlier this month, suggesting that the Government were perhaps going a bit cooler on nuclear investment? I think they moved quickly to stamp on that. Did it make you worried that we were not doing what Boris Johnson suggested?

**Tom Greatrex:** Look—your party, Chair, has given us the opportunity to hear what different people, who have both become Prime Minister since, had to say about the importance of nuclear and the energy security challenges that we face as a country. The current Prime Minister and the previous Prime Minister have both, at various points in the past few months, committed to exactly what is in the energy security strategy, so I don't think there is a concern about the consistency of that.

The point you highlight—the speculation—lasted about half a day, I think, before it was pretty comprehensively shut down by No. 10. What is underneath that is a concern about the pressures on public spending more generally, but when you look at the root causes of some of the issues we are facing, it comes back to having a power system that is overly reliant on burning fossil fuels, which are highly volatile in price and cause all sorts of other economic impacts. The best way to get away from that is to have a system that is not reliant on those fuels, and if you are going to do that in a way that provides a secure and reliable supply, nuclear has to be part of it.

**Q52 Rob Roberts:** I have a quick question for Tom. When Simon asked about the prospect of Trawsfynydd, you said that it looks like an ideal site. Leaving aside the fact that it has had nuclear before, what are the characteristics of an ideal site for an SMR?

**Tom Greatrex:** There are three things really. First, certainly in the first instance, it is a site where there has been or are nuclear facilities, and there are number of those around the country.

Secondly, there are sites that count as the nuclear estate in that sense that are not suitable for large-scale reactors, but could be suitable for SMR. I think Trawsfynydd is in that category because of the geography, the water supply and various other things that are relevant to that site.

Thirdly, the social licence is important. There is quite a lot of support for the beneficial economic impact that comes from that site, which has



produced nuclear power in the past, producing nuclear power in the future—to contribute not just to people’s ability to have a secure, reliable, price-predictable supply of electricity, but also to the economic impact in terms of jobs and activity in the area.

**Q53 Virginia Crosbie:** I apologise for being late. I was putting a Bill through to ban the import of shark fins—very different.

A lot of you have mentioned the Government’s commitments, and I thought it would be helpful to the Committee to list them. It is an incredibly powerful list that includes: the Prime Minister’s 10-point plan for a green industrial revolution, mobilising £20 billion of HMG investment back in November 2020; the energy White Paper, laying out our commitment to nuclear; and the sixth carbon budget, committing to a 78% reduction in emissions towards net zero. We hosted COP26 in Glasgow. There was £120 million to help develop Rolls-Royce SMRs; £170 million for the advanced modular reactors; £100 million to help advance plans at Sizewell C; and £120 million for the future nuclear enabling fund, which was launched on Anglesey. We also took the nuclear financing Bill through Parliament to make financing nuclear plants easier, and we approved the entry into the generic design assessment—GDA—for Rolls-Royce SMRs. That is a really impressive list.

What more we have got? You have talked about GBN—Great British Nuclear—and Simon Bowen, and we should hopefully have some news from him. Actually having this fleet mentality will enable us to plan, it will enable the companies to invest and it will enable us in terms of the supply chain coming forward. I am sure nuclear will be mentioned in the Budget tomorrow. The Prime Minister has mentioned nuclear in every single Prime Minister's questions so far.

As far as I see it, we have got the GBN news hopefully coming out, and I would like to see green taxonomy, which I know we will be talking about later. I am delighted that the NDA is looking at having its sites where we can actually have investment there. What more do you want to see? Do you want to see the Government taking ownership of these sites? Do you want to see the Government paying £200 million to Hitachi for the Wylfa site? What more do you want?

**Julia Pyke:** First, I entirely agree. There has been a hugely positive policy development, and I would also like to say what a great job the officials have done. Officials often get criticised, but in terms of making nuclear policy, they have done an absolutely cracking job.

In terms of what more we need, I think that when GBN publishes, it will be very helpful. It would be helpful to know specifically whether another gigawatt reactor is wanted for us. It would be helpful to know specifically whether another gigawatt reactor, or more than one additional gigawatt reactor include another UK EPR, because that is very helpful. As I say, it is not essential, but it is helpful to getting Sizewell C under way, and getting Sizewell C under way is the gateway to financing the rest of the nuclear programme, because it is a third and fourth effective units of Hinkley Point C with a much lowered risk profile and with, as Darryl said, at least five



years of preparatory work done with the financial community. If not now, and if not for Sizewell C, when?

We would like to see, in the context of very positive policy development already, clarity about more gigawatt and clarity about the prospects for another UK EPR, and we would probably like to see a streamlined planning process, without undermining democracy and the rights of people who live in the local area, and a streamlined approach to consenting.

Personally, I started advising on Hinkley in 2006, before my youngest child was born. Hinkley started construction in 2016. I have been working on Sizewell for five years. It has been in development for eight years and we need to find a way collectively to balance the entirely appropriate scrutiny process and the entirely appropriate process of consenting with pace, if we want to hit 24 GW by 2050.

**Q54 Virginia Crosbie:** I just want to push you on this, because I am sure that GBN next week will mention Wylfa, as it is a fantastic site. Answering my colleague's questions about Trawsfynydd, it is great for SMRs, but it is not suitable for large-scale nuclear, whereas Wylfa is suitable for both. I am sure it will be mentioned.

GBN will be technology-agnostic, so I think your ask in terms of what type of reactor is unrealistic, but in terms of the news coming next week and getting green taxonomy for nuclear, this is taxpayers' money. We are talking about the UK Government, but the reality is that this is taxpayers' money. Quite rightly, the Government are using their balance sheet on behalf of taxpayers. They are doing everything they can to reach out to industry—we've got the RAB model—trying to meet you. Realistically, what more do you really want before you move forward?

**Julia Pyke:** Before we move forward on plans for a third UK EPR?

**Virginia Crosbie:** Yes.

**Julia Pyke:** Just to be clear, I am absolutely not expecting GBN to make a technology selection in the near future. I am just saying that there would need to be a technology solution if we were to build a third UK EPR. We would like to see clarity about the process to make that technology selection, because for us to start to develop, for example, a UK EPR at Wylfa—I am not saying this in some competitive sense; the right choice has to be made for the country—we would have a process of some years of work to make sure that the design could be built on the site, to consult and to obtain consents for what we specifically were going to do. Of course, we would make the most use we possibly could of all the work done by the Horizon project but, still, we would need to do work.

To date, pre-development expenditure has been at the expense of the developer, not at the expense of the taxpayer. If that is going to be announced as a change, that is very different and it would potentially be a very welcome change, but to date it is at the expense of the developer. To know that it is worth your spending that money, you have to know that





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there is a realistic prospect of building that station on that site. It is very site-specific.

We have our generic design approval. We do not need to go through any of those preparatory steps. It is quite site-specific, so whoever is going to make the decision in whatever order would need to say, "We would really like a UK EPR here, at Wylfa."

**Q55 Virginia Crosbie:** Thank you. Tom, you mentioned host communities and those with experience of nuclear and welcomed the NDA's decision to give access to those sites to the industry. Is it your view that the Government should be buying the Hitachi Wylfa site with that £200 million to give the project the certainty it needs?

**Tom Greatrex:** I do not think that the Government necessarily have to purchase the site, but where Government might well be involved is in discussion with Hitachi, the owners of that site. That will happen only when there is a bit more clarity about what the programme is. You talked about GBN as though that is coming from Simon Bowen; Simon Bowen has done his bit of work, which was producing a report to Government. The announcing of GBN and exactly what its remit will be, so that GBN can set out the programme—it is not a technology choice, but is about whether there will be gigawatt scale and SMR and roughly how much of which, to enable everybody else to get on with it—is not for Simon Bowen, but for the Government. It is sitting with the Government and has been since the start of September.

I do not decry any of the list that you set out, but each one of that series gets more detailed. We are now moving towards being about delivery rather than the theoretical case and the systems case for how much nuclear you need. We have established that, I think, with the energy security strategy. We know what we need to do, which is to have up to 24 GW by 2050 as a contribution to the system. Now we have to focus on how we deliver it. That is why GBN is so significant and important.

From an industry perspective, industry has been patiently but expectantly waiting over the course of the past couple of months to get that announcement of GBN being established and set up. That is critical to wider confidence, and it should not be underestimated.

**Virginia Crosbie:** Thank you. Darryl?

**Darryl Murphy:** Again, from a financial investment point of view it comes down to the easier one, because it is just so far off. I reiterate the point I made about programme points and having certainty about what will happen next.

To Julia's point, the danger is that we do not want to be looking at a near-term investment at Sizewell, potentially, and saying that we are 10 years from another investment. Any form of clarity that puts a thread through that will make that clearer, otherwise there is a danger when financial investors look generically across other sectors at how the hydrogen



economy develops and so on, nuclear will look like this oddity on the side with one asset. It needs to be part of the mainstream energy policy.

Q56 **Virginia Crosbie:** So we need a plan, and we need Government commitment to deliver on that plan?

**Darryl Murphy:** Yes.

Q57 **Chair:** We will bring in Simon in a moment. Can I just ask you, Darryl, whether the investors you mix with regard nuclear as a green investment?

**Darryl Murphy:** I think that is a very good question about the debate around it and what exactly that means. I think the problem here is that we will get a little definitional about what exactly a green investment is. What I would say—we have advocated this institutionally—is that financial institutions think of a lot of investments under the umbrella, if I can put it that way, of ESG. That means environmental, social and governance—many of you will be familiar with it, but it is the framework by which we look at investments. Everything is looked at through that lens.

Clearly, in a nuclear sense many people will home in on the E part of that—on the environmental part. Julia and Tom will have other views on this, but to my mind the area that often gets the most scrutiny is waste disposal. That is probably the area that attracts most scrutiny into whether it is green or not.

My sense of this is that there is no clear binary decision on that point. You have to look at it with nuance. The reality with nuclear, if we look at some of the ESG analysis, is that there is clearly no solution today for long-term waste disposal, but there is a solution in the near term. Then the question is, how will that develop over time?

Looking at this in the round, per any investment, you have to make a judgment to some degree on the pros and cons. To that extent, nuclear does elicit—this is important to get across—some of the strongest emotions from investors, compared with other technologies, whether rightly or wrongly, because of reputation. To some degree, it comes down to whether that is detailed analysis, on a balance of my ESG arguments, or it is simply one of reputation or perception. Other than coal, which many institutions will have a clear policy against, there is no doubt that most technologies will not elicit the same debate as nuclear.

**Chair:** That is helpful. Thank you.

Q58 **Simon Baynes:** I have a quick question. What would be an appropriate split between private investment and Government investment for a new nuclear project? Darryl, you start.

**Darryl Murphy:** There is no mathematical answer to that. The key point is that Government investment in nuclear is on balance a good thing—because of the inherent nature of some of the extreme risks of nuclear—particularly when developing private investment in a sector that hitherto has not really received it, or certainly not from third-party investors. Government involvement will be seen as positive. It is the point about



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what we might call skin in the game, or just that idea of having Government aligned economically and financially, as well as from a purely policy point of view.

On how much that needs to be, I do not think that there is a clear line to define it—it does not even have to be a majority. Just the act of having Government alongside—if you look at the case of Sizewell—as a shareholder around the table is positive in providing that long-term support that goes beyond policy, which cannot be guaranteed in the very long term, to investors, who are potentially putting in their money for a long period.

**Simon Baynes:** Julia? You have touched on this in your comments.

**Julia Pyke:** The current proposal is that Government would take 50% alongside EDF and, once we had achieved financial close, Government and EDF would both sit at about 20%. I think that is a good balance. If Government wanted to retain an increased share and perhaps sell down more later in construction or operation, that is also a perfectly good idea. If Government had the majority—this is for Darryl to comment—I think that private investors might be more reluctant to come into a Government-majority project, because of the perceived lack of governance rights that the private investors would have. A substantial Government minority is a good thing. Like Darryl, I do not think that there is a particular numerical limit beyond the word “minority”.

**Simon Baynes:** Just remind us about EDF: is that largely state owned and partly floated, or is it totally state owned?

**Julia Pyke:** EDF is being renationalised. It has been over 80% state owned for some years, but it did have a minority private sector stake—

**Simon Baynes:** That was floated on the stock market.

**Julia Pyke:** Yes, that is right. It is now being fully renationalised.

**Simon Baynes:** Okay. Tom?

**Tom Greatrex:** The point I would reiterate is one that Darryl made. When thinking about this, we are talking about capital-intensive investments in long-term pieces of infrastructure. The ability for the private investor to have confidence does come to some extent from the level of Government involvement, particularly when the construction period is likely to last beyond a parliamentary term. That is really important because—forgive me for saying this—industry will often look and see that politicians often change their minds, or change decisions, sometimes when it cannot necessarily see the evidence base for making those changes in decisions. That is a factor, so “skin in the game” is the phraseology that Darryl used, and that is exactly right. That is important.

On the proportion, I agree with Julia: I do not think that there is necessarily a set proportion. I suspect that there will be different proportions in different projects. It might be that the proportion is lower in



subsequent projects, because of the effects that we have spoken about—of having a programme, and of having the first done and then more happening in that programme. That adds greater confidence as well.

**Q59 Simon Baynes:** I will just make one addition to that and then I will pass back to the Chair. If we look around the world, some models are state-owned, some are a mix of state and private-owned, and some are totally private. What is the prevailing model elsewhere in the world for this financing structure?

**Julia Pyke:** In many ways, the template for Sizewell C is Bruce Power in Canada. To address the point on whether investors regard it as green, Bruce Power recently issued a green bond that was six times over-subscribed. The answer is that it can be very well badged as green, and we intend to raise green-badged debt. That is assuming, Virginia, that the UK taxonomy comes out with nuclear in the right place. As you say, there are many models, but Bruce Power in Canada is probably the best model for us to look at.

**Chair:** Thank you, Simon. Ben Lake?

**Q60 Ben Lake:** Given the current economic situation, how likely do you think it is that the Government will invest in nuclear? Has the recent change in interest rates, for example, caused any concerns?

**Julia Pyke:** It is likely. We are very confident that policy is in the right place. We will see the proof of the pudding tomorrow. It is important to focus on why. The thing about nuclear is that even though it is undeniably expensive to build, it brings down household bills. That is not only because of the current gas prices. The case for Sizewell was made before the Ukraine war and the gas price crisis. In normal times, Sizewell C will bring down household prices once it is turned on. That is essentially because having a mix of dominant renewables, but with the right solid supporting proportion of nuclear, is cheaper for consumers than other systems. That is the basic case.

We should all do anything we can collectively to help people better understand what makes up an electricity bill, and to move away from the apples and pears comparison between the generating costs of a wind farm and the generating costs of nuclear. What people are really interested in is the impact of bringing that station, or that fleet of wind farms, on to the system. Are their household bills going up or down? In the case of Sizewell C, it is reducing household bills. That is the basic case, and that is basically why I think the Government will invest. It brings energy security, which has historically not been priced into the levelised cost of electricity, and despite all the media comparisons of apples and pears, it brings down household bills.

**Q61 Ben Lake:** And would higher interest rates make private and Government investment more challenging?

**Darryl Murphy:** May I offer a view on this?

**Julia Pyke:** Please do.



**Darryl Murphy:** It is important to note that there is an ongoing discussion, as Julia has alluded to, about relative cost analysis of different energy technologies. As Tom said, investment into net zero and into any energy infrastructure is very capital-intensive. Therefore, the cost of capital has a bearing. On an absolute basis, every energy technology will face the issue of interest rates. It would be no different if one were looking at offshore wind; the relative cost of capital for offshore that has been achieved to date will increase because of interest rates going up. The same effect will be felt across all technologies. They are all relatively capital-intensive, so it does not necessarily differentiate nuclear.

**Chair:** Thank you, Ben. Beth had a supplementary question.

Q62 **Beth Winter:** I apologise for being late; I had a Delegated Legislation Committee to attend.

You talked about bringing costs down to consumers. I would be interested in drilling down on the evidence you have for that because there is counter-evidence, particularly when you look at plants that have been built or that people have tried to build. I reference the Vogtle plant in South Carolina. It actually resulted in an 18% increase in consumer bills, despite the fact that it wasn't actually built. There is a lot of research to provide evidence that nuclear plants result in nuclear attacks on the public purse, because of the cost of overruns and delays. Can you give me specific evidence of where and how it has resulted in a reduction in energy bills? A lot of evidence I have seen actually says the contrary.

**Julia Pyke:** Yes. I will start off by saying that there has been an awful lot of media comment over the years about Hinkley Point C being very expensive, at £92.50 per megawatt-hour, but if Hinkley Point C were on today, it would reduce consumer expenditure by £4.5 billion a year. That is because energy security had not previously been priced in, so it does not look expensive today. People would wish it were on today and would think £92.50 very worth while.

The next point is on what makes up an electricity bill. This is very country-dependent. Some countries that have very large hydro resources that are not threatened by climate change may well not find that adding nuclear lowers their cost of an electricity system, so it is country specific. In the UK, we do not have large hydro resources, so we need something that is going to make electricity when the wind is not blowing and the sun is not shining. What is that going to be? Today, intermittency is filled in by fossil fuels plus nuclear. The existing nuclear is turning off over the next decade, because it was built in the '70s and '80s and it is reaching the end of its life—other than for Sizewell B on the Suffolk coast, which turned on in 1995.

An electricity bill is made up of the cost of generating the electricity—wind, solar, gas or nuclear—but it is also made up of transmission, meaning the cost of getting electricity from where you are making it to where you are going to distribute it to households. It is made up of policy costs, and, critically, it is made up of the cost of balancing the system. How are you



going to make electricity if there is not enough wind or solar in the system? The development of storage will obviously help. Technologies like hydrogen will help over time, but there is no known low-carbon answer to generating electricity in a weather-independent way today other than nuclear, which is proven commercially at scale.

**Q63 Beth Winter:** Can you give me an example of where it has been proven? I just gave an example of one in South Carolina that was never actually completed and resulted in an 18% increase in consumer bills.

**Julia Pyke:** Well, Vogtle is in Georgia—I think you are referring to that. It is being completed. It uses an income system that is not the same as the UK-regulated asset-based system. I am not an expert in US rate-based income systems, but my understanding is that the developer is not incentivised heavily to keep the costs down. In the UK-regulated asset-based system, the developer will bear a proportion—possibly 50%, but it is to be agreed—of any cost overruns, and will be very heavily incentivised. It is not really analogous.

The point is not really about whether there will be cost overruns. The point is that even with some assumed cost overruns, Sizewell C, when on, will make a cheaper electricity system—cheaper at the point of turning your light on and paying your monthly bill—than would be the case were it not to be built, because the alternative is fossil fuels, which are subject to fluctuating global pricing, or the development of very long-term storage to cope with very long periods of low wind and low sun. That is very expensive and also, critically, does not exist today.

**Q64 Beth Winter:** You touched on wind and solar very briefly. There is research by Imperial College's Energy Future Labs, and the University College London's model for Claverton Energy Group concludes quite clearly that, if investment was targeted at the renewable alternatives of wind and solar, there would be absolutely no benefit in pursuing nuclear, and that it is cost-effective to actually pursue those renewable energy sources. Are you familiar with that research?

**Julia Pyke:** Yes. There are many reports on future energy systems. I would like to emphasise that I am very strongly in favour of both wind and solar, and we see a system in the UK that is dominated by renewables but with nuclear as a supportive baseload. The Department for Business, Energy and Industrial Strategy has obviously studied this at enormous length and in detail, and has concluded that adding 24 GW of nuclear is the best way to achieve an affordable net zero by 2050. All this has been looked at. There are studies that say that you need an awful lot of nuclear, studies that say you need some nuclear, and of course studies that say that people believe that 100% renewables is achievable. The Department, which obviously determines policy on this, has concluded that you need nuclear in the system from an affordable route with energy security for net zero.

**Tom Greatrex:** Can I just say that the answer to your question is here and now? The cheapest electricity that is being added to the grid in the UK



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is coming from our existing nuclear fleet. If we didn't have that fleet, which, as Julia says, is getting towards the end of its generating life, your electricity bills would be higher. If you want a case study of where nuclear is lowering bills, compared with what would happen if you didn't have it, it is the UK now.

**Beth Winter:** We will come to the finance later.

Q65 **Chair:** We will bring in Virginia in a moment and then move on to Rob.

I have huge knowledge gaps on this, but isn't the point about the UK electricity market that the marginal price of electricity is driven by the balancing power source, which in our case is natural gas, so actually it doesn't matter that we are adding new fleets of onshore wind or whatever that offer lower-price electricity? Consumers are paying more because the electricity price is being driven off global gas prices, so having a greater share now of nuclear would not change the price of electricity now unless there is electricity market reform.

**Tom Greatrex:** No, it does currently because the power that is generated from our existing nuclear fleet is sold into the grid at a price that is significantly lower than where the wholesale price is now, so it has a definite current material impact on the price of your electricity.

**Julia Pyke:** And then new nuclear and new renewables are contracted for on a fixed-price base—the contract for difference or the regulated asset base model. They are paying a fixed price; they are not being built on a merchant price basis.

**Chair:** Okay, that is helpful. Thank you.

Q66 **Virginia Crosbie:** We are in the Welsh Affairs Committee talking about investment in nuclear in Wales, and we have had a lot of conversations about the UK Government, but of course in Wales and the Senedd, we have the Welsh Labour Government propped up by Plaid. Adam Price, the leader of Plaid, said that the party does not support nuclear, and that nuclear is not the answer. On nuclear investment in Wales, how supported do you feel by the political parties?

**Julia Pyke:** We were very pleased to see very solid cross-party support from Labour and the Conservatives for the introduction of the regulated asset base model. The Labour party has made very supportive statements not only about nuclear in the UK but specifically about Sizewell C. I have no reason to believe it would not be supportive of further nuclear development in Wales, so at a UK level we are very confident of consistent cross-party support.

In terms of Welsh politics, I am probably not sufficiently familiar with the views of Plaid. We have done a lot of engagement, not only with the financial community but with politicians over the years. We have not particularly engaged with the Welsh Government beyond all the benefits that Hinkley is bringing to the Welsh economy today, and that Sizewell will bring to the Welsh economy through the supply chain and workforce. I hope that, through engagement, we will bring some people over to the



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side of supporting us. If we were offered the opportunity, we would put a huge amount of effort into achieving as much cross-party consensus in the Senedd as we could.

**Chair:** Thank you. Ben, then Geraint, and then we will come to Rob.

**Ben Lake:** You do not need to apologise for your unfamiliarity with Welsh politics. Many people in this room are also unfamiliar with the intricacies of Welsh politics. I am the sole representative of my party on this Committee, and for the record, our long-standing policy position, as confirmed in several conferences, is that we would support new developments on existing sites. As far as I am aware, Wylfa and Trawsfynydd are existing sites.

Q67 **Geraint Davies:** Julia Pyke, you said a moment ago that nuclear is the only clean weather-independent way of generating electricity. That's right, isn't it?

**Julia Pyke:** Proven commercially at scale. We absolutely anticipate the development of carbon capture, use and storage, but today in the UK it is not developed commercially at scale. We very much hope to see it be developed, but if you are making a decision today about something you know will work—

Q68 **Geraint Davies:** The reason I ask is this. My understanding is that the technology is at hand to convert off-peak renewables. For example, wind energy captured on-shore in Wales—as you know, it is not allowed in England—is fed into the grid at the peak times of breakfast and teatime, and it is not used otherwise. Now it is being converted into hydrogen that can be put into the gas grid, for instance—40% of our gas pipes can take hydrogen—or used for transport and so on. If that was scaled up, that would be a weather-independent clean source of energy, would it not?

**Julia Pyke:** Yes. We are extremely supportive of the development of the hydrogen economy, and we would hope to be able to contribute to it by providing consistent power into electrolyzers, which makes better use of the capex—

Q69 **Geraint Davies:** I am not trying to be difficult. I am only making the point because you said in your evidence that nuclear was the only weather-independent clean source of electric energy, and it is not.

**Julia Pyke:** Well, hydrogen is not making electricity, is it? Hydrogen could be used to store electricity, and then if you wanted to use hydrogen to make electricity, that is a whole question; people have all sorts of different views about whether or not that is an effective or efficient thing to do, because of all the losses you incur in making hydrogen and then burning it.

Q70 **Geraint Davies:** But what I mean is, there is an alternative source of clean energy that is not weather-dependent—namely, hydrogen from off-peak renewables.





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**Tom Greatrex:** No, it is not, because to make hydrogen, you need electricity, so it is not in itself a source of electricity.

Q71 **Geraint Davies:** Right, but ultimately you do get a net energy contribution through hydrogen, do you not?

**Tom Greatrex:** You can use hydrogen potentially for heating, industrial processes and various other things, but to produce the hydrogen, you need a lot of electricity. I think the point you are making is that we could use excess electricity from other sources to create hydrogen, but hydrogen does not generate electricity, so it is not a source of low-carbon electricity.

Q72 **Geraint Davies:** Right, but the point I am making is that it is a source of clean energy that is not weather-dependent.

**Tom Greatrex:** No, it is not if there is not electricity generation.

**Chair:** It might help the Committee if I point out that there is a proposal for a small hydrogen plant in my constituency at the moment using both wind and solar, hoping that when the wind is not blowing, the solar will keep it going, so it is, in that case, weather-dependent.

Q73 **Rob Roberts:** I shall endeavour to bring us back to the subject, which is nuclear in Wales—God forbid we discuss what we are here to discuss! Unfortunately, Julia has spoken an awful lot, but my first question is specifically for Julia. I apologise, gentlemen; I will come to you. If we can contain our excitement, let us discuss the regulated asset base finance model. It has been used for large infrastructure projects in other areas—tunnels under the Thames and things like that—but we have never seen it used for nuclear. Can you give us an insight into how the regulated asset base model is working specifically at Sizewell C?

**Julia Pyke:** Yes. Let me compare it with the contract for difference for Hinkley. Hinkley is the only nuclear that has been built in the UK since 1995. The way the contract for difference works is that no income will be received by EDF for having built Hinkley until Hinkley turns on in 2027. I was appointed as Hinkley's external lawyer in 2006. That is a long old time to spend money before you earn a penny. If you incurred a credit card bill from 2006 solidly and did not start paying it off until 2027, that would build up some very considerable cost.

In Hinkley, the £92.50 cost actually represents very good value today, saving consumers £4.5 billion a year. Of that £92.50, £11 is the cost of construction plus cost of operation, and the rest of it is made up of the cost of money. The cost of money is divided partly into interest for all the years that you are spending without getting a penny back, and then it is the cost of capital, because EDF is taking all of the development risk. The development risk is a mixture of things that are attributable to the developer and things that are not—for example, delayed consent. There is a huge mixture of things for which they take responsibility. The outturn of that is that, even though the construction cost is £11, the cost is £92.50.

The regulated asset base model is designed to do at least two things. The first thing is to bring down the cost of money. It brings down the cost of



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interest by paying a small amount—a running yield that pays off the interest on the debt as you go through the construction period, so you are not building up a big pot of interest to be repaid when it turns on. By sharing—so that the developer remains heavily incentivised to control costs—the construction cost overrun risk between consumers and the developer it brings down the cost of the capital.

You are bringing down the cost of the money in both of those ways. In doing that, you also open up the opportunity to bring in investors who could not conceivably take the risk that EDF took in exposing its balance sheet from 2006 to 2026-27. That means that when the UK has been looking around for other developers of new nuclear, we have seen the Horizon project at Wylfa sadly go away and we have seen the NuGen project at Moorside sadly go away. We need to bring in new sources of money. It is doing three things: it is bringing down the cost of building up interest; it is bringing down the cost of the capital, equity or shareholder money, because it shares the construction cost overrun risk; and it opens up the financing of the new nuclear programme to a much wider pool of capital than is otherwise available.

**Q74 Rob Roberts:** The legislation that surrounds RAB says that there are two criteria to get it working. One of them is that the project is sufficiently advanced to justify the thing. What is sufficiently advanced, and who has borne the cost of getting it to the point of being sufficiently advanced?

**Julia Pyke:** In the case of Sizewell C, sufficiently advanced means that we have achieved our development consent order—that is planning consent, in old money. We have been consulting for eight years, and we have the development consent order, and we are well advanced with all of our other consents. We have a design that has been through generic design approval that is being built at Hinkley, so we have a much more mature cost estimate than other projects.

When we look at the source of some of the cost overruns at Hinkley, in 2015 when the original cost estimate was made public it had not been properly understood as to what the cost would be of all of the UK adaptations of building the EPR technology in the UK. Discovering that actually those adaptations required more steel, more cable, and more time to install those things—and the design changes that stem from the installation of extra equipment, which therefore makes the building heavier and sends you back to recalculate the seismic conditions—was a big contributor to the cost overruns in Hinkley.

We do not have that for Sizewell because we are taking a known design, which is being built, so we know what quantities we need. We know what design we are building to and that we are taking the key supply chain from Hinkley to Sizewell and endeavouring to build Sizewell as, effectively, units 3 and 4 of Hinkley. That is the package that allows us to know that it is suitable for a regulated asset base model; it is de-risked by being very largely consented, having a known design and having an experienced team building that known design.



**Q75 Rob Roberts:** That was very comprehensive. Thank you very much. I will ask Darryl a broader question. Do you think that the Government in their current state are in a strong negotiating position to achieve a good deal with taxpayers' money?

**Darryl Murphy:** In relation to—

**Q76 Rob Roberts:** In relation to the asset model and the funding of nuclear.

**Darryl Murphy:** The way I would consider it is: if you go to the financial community with the proposition as planned—going back to my point about Sizewell, sadly, but it goes for any nuclear plant—paying particularly careful reference to the taxpayers' money, the key part is what that RAB model looks like. Any investor is going to say, "What risk am I being asked to take on, and what return do I feel is appropriate on that basis?" For want of a better word, the calibration of that risk profile and that RAB, which is set out and which Julia may tell me is reasonably well in discussion with officials and in terms of Sizewell, will be put to the market. That will be priced on an appropriate basis, which can be benchmarked.

In terms of the leverage and negotiation, I do not see it in quite those terms. In the context of Sizewell, I am sure EDF will say, "This is a proposition that has been negotiated. This is the RAB model and this is how we are going to build it. This is the technology." As an investor, you want to look at that proposition as a package and price the risk and return. That negotiation is not won against Governments as such. Ultimately, we also have to remember that the person paying for the funding for this will be the consumer. There has to be a sense of, "There is not the taxpayer, and it is not their point of view." There are different aspects in terms of how the RAB model works.

As Julia said, there is an allocation of risk. Ultimately, all parties have risk and an appropriate return that they are seeking against that, so I don't quite see it as a negotiated process—certainly not from a financial investor's perspective.

**Q77 Rob Roberts:** Tom, you have been here. You understand Government and how it all works. You know the political side of things as well as the financing side. In terms of the regulated asset-based model then, what do you think about the Government's negotiating position? Can they get a good deal with the taxpayers' money? Is this a better way of doing it than CfD?

**Tom Greatrex:** For projects that are not first of a kind, I think it is certainly a better way of doing it, for some of the reasons Julia has just stated. That is mostly because it reduces the cost of capital reduction and capital, as well as increasing the pool of investors, meaning that ultimately the consumer will pay less. That is the key point about it. When we had the CfD for Hinkley, the National Audit Office did an assessment in 2016 or 2017. Appendix 4 of that report showed what the cost would be—the headline cost—if you used different financing mechanisms. The work they did basically demonstrated the case for having a different mechanism to reduce the cost of capital and, therefore, how much the consumer pays. If



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the root of your point is about how the Government is protecting the interests of the consumer, then using that type of mechanism means that the exposure to the consumer is much less than it would be if you were using the CfD as it is being used at Hinkley. That is quite apart from the fact that trying to do it with the CfD, as with Hinkley, would be almost impossible now, because who is going to have the balance sheet to bear it in the same way as happened at Hinkley?

**Darryl Murphy:** May I just add something? To echo Tom's point, I can be quite clear in my view that you could not replicate the Hinkley Point deal on the basis of what we are looking at. Hinkley worked, as Julia eloquently described, because EDF carries all the construction risk up to the point at which the CfD kicks in operation. The CfD, from a financing point of view, addresses long-term revenue stability. It does nothing to the construction risk. It puts that fairly and squarely on the developer.

EDF has made very clear its position on Sizewell and that it is unable to take that risk on another plant. If you are looking to third-party financial investors, I would go as far as to say that I do not think the CfD is financeable on that basis. If you want private investment from third-party investors into nuclear, the RAB model is the only way. If you don't want to do that, there is only one other route, which is that the public fund 100% of it. You have two quite clear choices. From my point of view, the Government have to make a choice. You can do it either way.

**Q78 Rob Roberts:** Thank you. To follow up on something Ben said earlier on, if you could name one thing that the Government could say tomorrow in the autumn statement that would help investment in nuclear, what would that be?

**Julia Pyke:** Going ahead with Sizewell C.

**Darryl Murphy:** I agree. Sizewell C as part of a programme. They are not going to be able to say realistically what that programme looks like, but there needs to be a delivery plan, and Sizewell will unlock that.

**Tom Greatrex:** The Government have already committed to Great British nuclear as a concept, so properly launching and driving that programme, starting with Sizewell and carrying on through, will give that confidence.

**Q79 Geraint Davies:** This question is supplementary to what Darryl said about the choices. Obviously, the private sector, in this case, is taking a calibrated risk about the future and the uncertainties there, and, in borrowing from the market, the cost of capital reflects that, but obviously that cost of capital is going to be much higher than if the Government simply borrowed the money, and they can obviously manage risk in the future more holistically. Therefore, the consumer would surely get a better price by us owning the asset, even if we got the private sector to build it—subject to constraints—than by basically getting the private sector to build it and finance it, and having to negotiate a strike price to pay that back.

**Darryl Murphy:** My simple answer to that is, at the end of the day, that is a Government decision to make.



Q80 **Geraint Davies:** I know that, but it's true, isn't it?

**Darryl Murphy:** Well, it's the key points of risk and return; there are two key points in that point. I have spent many years, historically, doing PPP, and it's the same argument: is there valuation of that risk transfer to Government? The Government-funded option—financial investors are quite neutral about this; it's a decision to be made. But if, generically, you want to proceed on a publicly funded option, there is a point about affordability, which we shouldn't dismiss. Government then would have to put a very large amount of money into that investment, in austere times. But more importantly—to your point on risk transfer—the Government are holding all that risk. And the ability to transfer that risk in delivery is much more difficult in that instance. But the analysis, which I am sure officials will look at, on part of the RAB model is the capacity and value for money assessment, which is to look at the value of the risk transfer that they believe they are achieving—through the RAB model in this case.

Q81 **Geraint Davies:** On risk management into the future for nuclear, my understanding is that if, for argument's sake, the world had 12% of its energy from nuclear, we would run out of uranium by 2050. And now we are in a situation, of course, where Russia holds a lot of uranium deposits and obviously Ukraine does as well, and it is currently occupied. Hopefully Russia will be booted out, but we don't know. I am just saying there are unknown unknowns, future uncertainties, that presumably the private sector factors into the cost of capital that consumers have to pay.

**Darryl Murphy:** Yes, I think that is one of very many points, as you say. When one looks at the diligence process of making investments, those risks have to be identified. That is, as I say, a well-worn path in terms of the risk analysis in looking at what the relative risk and return would be, particularly if it's a long-term investment. That will be technical. It will be against operations. It will be against the supply of fuel in that case. And it will be against things like political risk. That all has to be factored in when someone determines their cost of capital.

Q82 **Geraint Davies:** Finally, I want to ask about the relative cost of either Government building a plant or getting the private sector to borrow money in the marketplace and build a plant. It is the case, isn't it, that it would be cheaper to build it from the public sector? But the problem, as you pointed out, is constraints in terms of public sector borrowing requirements. In a way, this is a rule, but obviously the present value of future cost streams to pay the other capital would be higher—

**Darryl Murphy:** It is a statement of fact that Government can borrow more cheaply than the private sector. That is correct. But my point is that you have to value risk transfer in that. It is the two points—it is a constraint against that capital. There is a reason why individuals take mortgages; it's because they cannot all pay for their houses up front. It's the same principle for public spending. Government can make a choice—I'm talking about how they choose to raise the capital they can raise. But importantly, it's not just, then, a transfer of saying, "Well, there's a cost to bear." You have to look at the value for money from the point of view of



risk transfer. And I would argue that you cannot achieve the same level of risk transfer by fully funding a project yourselves—from a Government perspective.

Q83 **Beth Winter:** Mr Murphy, you clearly feel that the RAB model is the best way of developing the nuclear system. From what you have said, the RAB model is—

**Darryl Murphy:** Sorry, can I just clarify that? On the basis that Government want to use private capital, the actual model being a RAB model, which is a very particular risk transfer model, is the only way that can be covered.

Q84 **Beth Winter:** Okay. Again, I am playing devil's advocate to a large extent here. There is evidence to the contrary. There are risks—particularly of risk being transferred on to the consumer. Construction costs and risks associated with that and costs for overruns are mentioned. People such as the National Infrastructure Commission and the Energy and Climate Intelligence Unit have expressed concerns about the transfer of risks to the consumer.

I will just quote what the economics editor of *The Times* actually said. He said that the RAB "might avoid a re-run of Hinkley saddling consumers with rip-off bills decades out, but only at the price of leaving them exposed to construction risk... 'Under the proposed RAB scheme, energy bills will increase to pay for nuclear power stations before they start generating.' In short, we'll be paying upfront for EDF's routine screw-ups." What do you say to people who raise those sorts of problems?

**Darryl Murphy:** The first important point, before we get into the detail, is that it does not create new risks. Those are the same risks that exist under any delivery model. Construction risk in nuclear, sadly, is a fact, like in any capital-intensive infrastructure. Therefore, it is about how that risk is allocated.

From that perspective, the RAB model, when you look at it goes back to a very boring point about, in my view, the balance of value for money against risk transfer. I am not patronising you, but you either get people to price that risk fully, or you choose to allocate it in a way that gets you the best value for money.

Under the RAB model, it is absolutely fair to say—I think it is important that Government are open about this—that the consumer is in a different position to what they would be under the CFD model at that point during construction, because, and I am sure Julia will not deny this, if you go through, there is a risk allocation. Julia has indicated that the developer can take risks—you can calibrate that—and financial investors can take an element of risk, but there will be risk that potentially flows through to the consumer.

It is exactly how the Thames tideway model works at the moment—on that basis. I, as a Thames Water payer, am exposed to some of that risk



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for any potential cost overruns. Why do that? Because, on balance, it gives the best value-for-money point of view.

The last point I would make to that reference, which I have heard a lot on, is that I thought we had turned a corner on this. The arguments about intergenerational costs, I think, disappeared when net zero became real. I do not think it is unfair for generations today to make payments towards our children's futures and net zero. For that reason, the point about the RAB model putting costs today on consumers, I think, can be very clearly articulated in the context; we are having to make difficult investment decisions today for the future.

**Julia Pyke:** Could I just emphasise that the payments for up-front consumers are low? We are very conscious of the cost of living crisis, so, in this Parliament, no more than, say, £2 per year per household will be added to bills for Sizewell. At the peak of construction, it will be of the order of £1 per month per household.

If you are looking at Venn diagrams of consumer groups, it is the consumer group that would be paying the £1 per month per household that would then benefit from the station when it turned on. I must emphasise that it is a small up-front investment for a better risk-sharing model, which will reduce the costs of electricity once the station is turned on.

**Q85 Ben Lake:** I will just come back to something that you have all alluded to in previous answers—whether or not the RAB model is just as appropriate for first-of-its-kind projects. We have received some submissions raising a few questions about whether it is that good for such projects, on the basis that there will inevitably be uncertainty in the build cost of any such build.

Do you have anything to elaborate on that? In particular, do you think that those sorts of concerns are perhaps mitigated when it comes to Wylfa, by virtue of the fact that the design has been built in China and is already under construction in the US.

**Tom Greatrex:** It is the AP1000, which is the Westinghouse one and one of the designs that has been through a GDA that is a gigawatt scale. Just for clarity's sake, there is the EPR, which is being built at Hinkley, and potentially, at Sizewell, there is another one, and there is an ABWR as well, so there are different technologies that have been through the general design assessment.

To answer your question, it depends on how different the UK-assessed design is from what is being built elsewhere. I think the point that Julia was making was in relation to the EPR at Hinkley, and there are amendments to the design that were not there when it was built in other places, so it depends on that.

It is also different when you come to talk about small modular reactors, potentially. You have probably had evidence from Rolls-Royce talking about whether the RAB model would be attractive and the impact that would have. The concept is slightly different because they are effectively

factory-built modules and they are put together on site, so some of the issues around construction, risk and first of a kind are quite different. There are a number of different factors to take into account there, but fundamentally it depends on the difference in the design and how different it is from where it is built elsewhere.

**Q86 Ben Lake:** Is it your understanding that the RAB model would cover the development phase of the project? Forgive me—I know there has been a lot of talk about the RAB model, but it is still not quite clear to me.

**Tom Greatrex:** The pre-development phase, did you say?

**Q87 Ben Lake:** The pre-development phase itself.

**Julia Pyke:** If a project is awarded a RAB licence, then the licence will look back and include the sunk costs if the project is going ahead. Currently, the sunk costs are incurred at the risk of the developer. Whether Government policy is going to change on that is a question for the Government, and I am not aware of their current thinking.

**Darryl Murphy:** To be clear, it could feasibly be done, so obviously there is an even greater debate for the Government to have about the merits and the risk transfer of some opportunities. The other consideration is that that may ease a current gap, which is what I would call that pre-development cost. It is very large with nuclear, and that is fine so long as you have a large developer who is able to put money in. From evidence I have seen to date from many SMR developers who come to my door, I would say that there is a big gap in development capital. There is a gap that needs to be filled somehow.

**Julia Pyke:** If we think about how other infrastructure is developed, when the National Grid builds a new transmission line, that is paid for by consumers as it goes along all its stages. The Thames tideway tunnel was developed on the consumer bills of Thames Water. The pre-development expenditure was borne by the Thames Water consumer. For a nuclear programme, I think that is something well worth the Government thinking about.

**Q88 Chair:** I have a question for Darryl Murphy. With the regulated asset base model, what would be a similar investment option for people like yourselves that isn't nuclear but shares the same risk profile? What would be an equivalent asset that would be as risky?

**Darryl Murphy:** To clarify—and to come to a Member's earlier point—to date, the Thames tideway tunnel has often been used as the example. In practice, in the UK that is the only example of a large-scale construction project using that model. That is why it is heavily used as an example. The regulated asset base model, generically of course, provides a huge amount of capital into regulated utilities—so all of the English and Welsh water sector in terms of energy transmission and distribution.

**Q89 Chair:** Presumably the risk premium for Thames tideway is very different from a nuclear plant?





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**Darryl Murphy:** It is demonstrated—and certainly the NAO has reported on this—that under the tideway model, the final outcome on cost of capital was lower than the actual regulated award at that point in time. One could argue that it was possibly competition that drove it down. It was a competitive process. There isn't necessarily a premium by fact. Clearly, if you move forward, one has to be a bit cautious if you compare nuclear against tideway in that sense. The nature of the asset is different.

I would say that tideway, even though it is still going through construction, is a fairly large, complex construction project. The technology risk is more about civil engineering with drilling, but is a fairly—if I can call it—passive operation. It does a certain role; it is not very active. Nuclear has some idiosyncrasies and it obviously has to be adapted, which I am sure is being looked at through the RAB model. Overall, the goal—which was the goal at the outset of tideway—is, to an investor, to make it look closer to a regulated utility that they can invest in today, which would be an energy or water asset.

Q90 **Geraint Davies:** I just want to ask a quick question, to Darryl maybe. Hinkley is still being financed by China, isn't it? Is that right?

**Darryl Murphy:** The shareholders of the entity, which I understand to be EDF and CGN, are funding it. So it is purely 100% shareholder-funded.

**Julia Pyke:** It is 66.5% EDF and 33.5% owned by CGN.

Q91 **Geraint Davies:** Right. Are borrowing costs to be subsidised by the Chinese Government being able to get lower-cost capital, therefore undercutting the market?

**Julia Pyke:** The whole thing is shareholder funded, so there is no borrowing; it is shareholder funded so it is coming from the income streams and assets of EDF and the assets of CGN.

**Darryl Murphy:** The determination of the strike price is effectively a function of the capital cost and the cost of capital—to use a phrase—and that cost of capital was built in up front, so the return is effectively predetermined from Sizewell, because they receive a strike price once the plant is operational. There is therefore no impact underlying that in terms of any ongoing cost of capital; there is no future debt raised in that sense.

Q92 **Geraint Davies:** So, it is not the case that the Chinese Government are subsidising the cost in order to undercut the private market to get business in future.

**Darryl Murphy:** I am not aware of that. As I say, the assessment is a very simple one: what the reasonable cost of capital was for that project at the time.

**Julia Pyke:** CGN invested in Hinkley after the strike price was agreed. So, Hinkley was agreed, based on negotiations at the time, between what the forecast cost of Hinkley was and what was a reasonable return for bearing all that risk. The price was agreed, and CGN invested later.



**Q93 Chair:** That is helpful, thank you. It is conceivable that, if the Government get moving with this, we could have Sizewell C being built at the same time as work starts on Wylfa. Tom Greatrex, from an industry perspective, are there enough welders and other skilled trades out there actually to build two nuclear power stations at the same time, in parallel?

**Tom Greatrex:** Today, no. That comes back to the programme. If you have clarity of programme—what you are going to do and the timeframe you are going to do it in—that enables the supply chain and others to invest in training people and in developing the skills and the programmes to make sure that you have enough welders.

**Q94 Chair:** We cannot get welders in west Wales at the moment. They are all earning good money at Hinkley Point.

**Julia Pyke:** Which is a good thing.

**Chair:** Yes, it is a very good thing.

**Tom Greatrex:** It is a good thing for the welders. We see skills shortages across the economy at the moment. There is a wider issue of skills development, but if we are planning—as we need to—effectively to renew our electricity transmission system completely, and the generation components of that, we need to be able to deliver it. We need the people to deliver that. If we do not have a programme, if what we do is say, “We’ll build Hinkley, wait and see, and decide a bit later whether we will do anything else, then wait another 10 years before we do anything else”, we will not have enough of a pipeline.

**Julia Pyke:** May I give you a granular example? Hinkley has had to revive construction skills as well as nuclear construction skills, so it has founded welding centres. So, for Sizewell, we will have another welding centre. If there is a programme in which we knew that welders would be needed at Wylfa, then the welding centre would be sized to train the number of welders needed for the programme. If the welding centre only knows that Sizewell is coming, it will be sized to train welders for Sizewell.

**Q95 Chair:** It feels to me that there is a challenge here for Government that is perhaps almost as big as the discussion we have been having in some detail on the finance challenge: finding people, youngsters, who want to go into those trades, who get excited and motivated by them. Yes, you are having a stream of projects, and that is not just in the nuclear sector, but in other energy, such as offshore wind. Similar trades would be involved in that. It seems to me that there is a big challenge for Government. In Wales, of course, that is devolved to the Welsh Government to seize this and to say: “Right, these are the trades that we are going to be needing in the next 10 to 15 years. FE colleges, universities, we want you to get cracking.”

**Tom Greatrex:** How you assess what you are going to need for those 10 to 15 years comes from having a programme. All routes go back to that, which is why it is so significant, particularly right at the moment given the earlier questions on CGN and related issues.



## HOUSE OF COMMONS

**Julia Pyke:** There is a challenge and a huge opportunity. There is also an opportunity to join up some Government thinking, if I may say so. Why do we have a shortage of welders? FE colleges have been funded at a level such that they are not able to run welding courses, which are expensive. That is the root cause of why we do not have enough welders in the UK. I have to pay tribute to the fantastic job that Hinkley has done in retraining UK welders, but we need to join up thinking on how FE colleges are funded.

In Suffolk, we are heavily engaged with all the Suffolk FE colleges, but the way that they are funded is that they are not paid to train someone who is destined to work on Sizewell until they have passed through the course. That is the point at which they are paid. So, if today they have had no cause to run particular construction courses, they would then have to incur capex: they have to hire people to teach the course; the course has to be credited by our supply chain; they have to recruit the kids or people to go through the course; and then they get paid.

That is something that could usefully be joined up with the way in which the Department for Education funds FE colleges, so that those big projects can act as catalysts. Hinkley has added as a catalyst in the west of England for huge investment into FE, and it has been very successful. Sizewell will do the same, but if there were more joined-up thinking, particularly on how FE is funded, it would have an even greater effect.

**Chair:** I think we are coming to the end of our session. As there are no further supplementaries or comments in Committee, I say a huge thank you for giving up your time to be with us. I have learnt an awful lot in this session. It has been very informative. We have gone into some detail on some of the issues, so thank you for bearing with us and helping us move up the curve of understanding. There are some big issues for Government to consider, and we will look closely at what they will be saying tomorrow and in the days ahead. Thank you once again.