HOUSE OF COMMONS

Science and Technology Committee

Oral evidence: Delivering nuclear power, HC 626

Wednesday 18 January 2023

Ordered by the House of Commons to be published on 18 January 2023.

Watch the meeting

Members present: Greg Clark (Chair); Aaron Bell; Dawn Butler; Chris Clarkson; Tracey Crouch; Stephen Metcalfe; Christian Wakeford.

Questions 384 - 515

Witnesses

I: Simon Bowen, Industry Adviser, Great British Nuclear.

II: Mark Foy, Chief Executive and Chief Nuclear Inspector, Office for Nuclear Regulation.

III: David Peattie, Chief Executive Officer, Nuclear Decommissioning Authority.

IIII: Rt Hon Graham Stuart MP, Minister for Energy and Climate, Department for Business, Energy and Industrial Strategy; and Declan Burke, Director, Nuclear Projects and Development, Department for Business, Energy and Industrial Strategy.

Examination of witness

Witness: Simon Bowen.

Q384 **Chair:** This is the Science and Technology Committee's sixth and final session of oral evidence on delivering nuclear power.

We are very pleased that to kick off proceedings we have Simon Bowen here in person. Mr Bowen is industry adviser to the Department for Business, Energy and Industrial Strategy, with a particular focus on Great British Nuclear and its establishment.

May I start by asking you to describe what Great British Nuclear is and what purpose it is going to serve?

Simon Bowen: I was appointed by Prime Minister Johnson and Secretary of State Kwasi Kwarteng in April to do a sprint, essentially, over 100 days, from May through to September, to determine what the scope and structure might be for a body that would support Government in delivering the ambition of the energy strategy, which was up to 24 GW.

My task was to look at all the international systems—what other countries do and how they deliver their nuclear programmes—and to go out to the industry to talk to it about what it needs. I was to talk to Hinkley Point about how its project has gone and to Sizewell, to work out what they think is needed to deliver a successful nuclear project and then to develop an organisation that might deliver a programme.

We concluded in September with a report that was meant to go to Prime Minister Johnson and ended up going to Prime Minister Truss. The report had 25 recommendations. It concluded that an arm's length body should be set up and that that arm's length body should essentially act as the glue within the industry to drive a nuclear programme.

The conclusion from all of the evidence that we gathered was that if you are going to be serious about nuclear you have to do it as a programme—you cannot do it project by project—because there are significant benefits. Its purpose was programme management and, essentially, to act as the lead for that programme on behalf of Government.

Q385 **Chair:** That report went to Prime Minister Truss. Have you had feedback from the current Prime Minister about whether he endorses its recommendations?

Simon Bowen: No, we have not. We have had feedback from the Secretary of State, Grant Shapps, to say that he is fully supportive of the recommendations that we have put forward. Knowing that there was likely to be a change of Prime Minister and Cabinet Ministers, we spent a lot of time getting all the Whitehall machine—all the civil servants—to agree with the recommendations, so we had a significant governance structure, including the Treasury, BEIS and the Cabinet Office, across the whole of Government. They were very supportive of what we were proposing.

Where are we now? That support still exists within BEIS, but clearly there are substantial fiscal pressures, which you will know better than I. They are currently considering our proposals to determine what the right direction forward is. The Prime Minister has committed to setting up GBN, as has the Secretary of State. The Chancellor of the Exchequer has mentioned it at Prime Minister's Question Time, so the intent is to set it up. I think that it is a question of pace and scale.

Q386 **Chair:** In terms of the Prime Minister's commitment to it, what has the Prime Minister said by way of endorsement of the idea?

Simon Bowen: It has been a broad acceptance of nuclear. If he has said anything specifically about Great British Nuclear, I am not aware of it.

Q387 **Chair:** The idea was first put forward under the Johnson premiership.

Simon Bowen: Yes.

Q388 **Chair:** For most of that time, the current Prime Minister was the Chancellor, so presumably he was involved in those discussions and had to give his approval as Chancellor. Is that correct?

Simon Bowen: Yes, I believe that that is the case.

Q389 **Chair:** Is there a timetable for the green light or red light from No. 10 that I assume is required for it to proceed?

Simon Bowen: I believe that they are in a process. You would be better asking the Minister exactly where they are on that. Our latest information came at the end of the year, when the Chancellor said that we would be setting up Great British Nuclear early in the new year and that various papers would be going between the Departments, the Treasury and No. 10 over the next two, three or four weeks. Our latest intel is that a decision is likely some time in February.

Q390 **Chair:** You mentioned fiscal pressures. Is that your hunch as to what the discussions are around—whether this is affordable?

Simon Bowen: Yes, and from discussions with the Treasury. The Treasury is under obvious pressure as regards the amount of money that is available to support a programme such as nuclear. In the conversations that we have had, it has regularly stated that there are substantial pressures and these are difficult decisions, because the investment that is required in nuclear is substantial.

One of the prime conclusions we came to in the report is that if you look at the international systems, the successful systems have a substantial amount of Government leadership and fiscal support, in terms of not just financing but who bears the risk. You need to bear in mind the previous failures of things like Horizon and NuGen, which were substantial financial hits to those private companies. There are very few companies that have the balance sheet or the will to take all of that risk now.

Our conclusion is that in the early stages, in particular, there has to be substantial Government investment, particularly pre-financial investment decision. It is possible that you can circulate that money back around, as private investors come in later, but the way to attract private investment back into the UK market is now to get a programme in place, to start building and to build confidence that the industry can build them on time and on budget, at which point the private sector will be prepared to take much more of the risk at an affordable cost. All of that has been put forward. We have said that you will have to invest a substantial amount of money to get the nuclear programme up and running.

Q391 **Chair:** Is it your understanding that the discussions that are taking place, principally with the Treasury but also with others, are about the amount of money—the quantum of money—that might be invested, or about whether any public money at all should go into nuclear, above what is clearly committed? We will hear from David Peattie of the NDA later. There are lots of things that are pre-committed. Is this a question about whether there will be an ongoing commitment to new nuclear, or is it just about the scale of it?

Simon Bowen: It is the latter. I have not asked that question directly. My interpretation of the conversations that I have had is that everybody still supports nuclear. We have not heard anything to suggest that people do not support new nuclear. It is about scale, pace and, therefore, affordability.

The piece that is missing for me at the moment is the overarching strategy, which is where Prime Minister Johnson started. That is about saying, "We need energy security in the UK—full stop. We accept that. If you need energy security, what is the quantum of nuclear that you need to secure that?" If I reflect on where I think we are now, that is the piece that needs to be reinjected into the conversation. We need to say, "Energy security is a national imperative. We have to invest early. We need a plan that tells us which technologies we need, and when and where." Once we have that, you can build a programme around it. It is about that strategy.

Q392 **Chair:** At the moment, we do not have that strategy.

Simon Bowen: That is not visible to me. That does not mean that it does not exist, but it is not visible to me.

Q393 **Chair:** If it is a question of how much and how we are going to do this, why should that be a cause for delaying the establishment of Great British Nuclear? Presumably, the case for the vehicle is irrespective of how much public money is going to be put into the development of new reactors.

Simon Bowen: To a degree, yes. Can you set up Great British Nuclear now, and should we? Absolutely, because it has a pivotal role to play. If you are committed to new nuclear, you absolutely need Great British Nuclear to support that.

The premise we have come up with for the type of organisation that it needs to be is that it needs to be resourced with world-class capability in programme management, project management and the ability to drive a lot of the enablers that sit around that, in finance, regulation and consenting. To be able to attract that type of talent, you have to be able to articulate what the scale of the organisation is. Therefore, you need to be able to articulate what likely budget it will have over the next two to five years.

Q394 **Chair:** I see. This is very helpful evidence. You may have seen from our earlier sessions that some witnesses expressed some mystification or confusion as to what GBN was going to do. That is a perfectly reasonable thing, since no one knows yet.

Simon Bowen: Of course. It is understandable. I was asked to provide some policy advice to the Prime Minister. We have not made public the recommendations—and I have not asked to—because it is advice to the Prime Minister and the Secretary of State. We have networked widely and interfaced with industry very widely. We have talked in broad terms about what GBN would do because it has been based on the advice that we have been given by the international systems and by industry in the UK. People in the industry have a broad understanding of what it is going to do, but the fine detail is yet to be worked out and will not go public until Ministers decide that that is appropriate.

Q395 **Chair:** Does it need to be that way? If this is going to be a big decision for the organisation of nuclear, shouldn't it be an open discussion with the sector as to what the best model is? To keep it all secret until the Prime Minister has decided and then to say, "This is how it is going to be," seems rather suboptimal.

Simon Bowen: Have we kept it secret? No. What we have not done is publish the report. That is probably a more accurate way of putting it. We have developed the principles in tandem with and with significant input from industry. The team was not just a team of civil servants—it was a team of industry secondees plus civil servants. All the eight workstream leads were industry experts, and we had a panel of industry advisers who were global chief executives from the nuclear industry. We tested the ideas through roundtables with industry and brought in chief executives to test the organisational structure, so it is widely understood what it will do. However, at the end of the day, the Prime Minister and his Cabinet have to decide what scope they are prepared to support. All that we have done at the moment is recommend. What we do not have is a firm decision about what it needs to look like.

Q396 **Chair:** It is clearly not a matter for you—you are an adviser to the Department. However, the standard process in Government is to have a Green Paper or White Paper where proposals are published so that people can discuss them. It seems very odd to have such an important proposal that is, in effect, secret in its written form, even if you are empowered to have conversations with interested parties to shape and understand it.

Simon Bowen: That is a question for Ministers, I think.

Q397 **Chair:** I have a final question before I turn to my colleagues. Is it envisaged that Great British Nuclear, if it is established, will be a statutory body? In other words, will you need legislation to set it up or will it be a more informal advisory body, using the existing powers that Government and the Department have?

Simon Bowen: I am starting to stray into the territory of things I know a little bit about. It is a question to which I can hum the tune, but I probably do not know the words very well.

Our recommendation is that it should be a non-departmental Government body that is at arm's length. We think that it is possible to put it into an existing legal entity. However, we will require legislation to set it up with the powers that it needs because it must have the space and authority to run a nuclear programme. This is a multibillion-pound programme over many years. We must have the authority to be able to recruit the people at the salaries at which we will need them. These will be industry salaries. It is less likely that they will be Government salaries.

We must also have the procurement freedom to be able to place contracts and to use the scale of the programme to provide value for money. It requires a substantial amount of freedom to be able to do that—all within the boundaries of the delegated authority from the Treasury and from Government, of course. There will be a period of earning trust to get that at the level at which we need it, but it absolutely has to be independent to be able to exercise its role in the driving of the programme.

Q398 **Chair:** So it needs legislation.

Simon Bowen: Yes.

Q399 **Chair:** You said that it might make use of an existing entity. Do you know which entity that would be?

Simon Bowen: I am not sure whether I am at liberty to say that.

Q400 **Chair:** Okay. You would use something, but you would need legislation.

Simon Bowen: I had better check that with the Department. I can tell you that afterwards.

Q401 **Chair:** Of course. We are in the last two years of this Parliament. It seems unlikely that we will have legislation through that period. Given that this is meant to galvanise and to empower a greater sense of pace in the delivery of nuclear, it seems to me that if we are waiting for primary legislation it may have the opposite effect.

Simon Bowen: It is exactly the question that we have asked as well. If you look at the activities that you need to set up immediately, you will not be running an enormous programme to start off with, because you do not have the projects on the ground.

In my mind, there are four workstreams. There is paying to set up the arm's length body, which is a substantial piece of work, of course. That is the knitting of how the organisation works, with all the authorities that it needs. You then have to decide what technologies you need and at what scale they need to be. A lot of that is in policy space, but we can support how you make that decision. There is siting, which is about what goes where. These sites are national assets. GBN has to determine where the various projects go. Then there are the funding and financing models. We need to work with the industry and the market to determine what might be appropriate funding and financing models.

Those things can be done with contractors, secondees or whatever you want to call them, working within BEIS, in the interim—between now and when we set up the body. My view is that we have to go flat out as soon as we can to get this set up. We cannot afford to wait for the legislation.

Chair: That is very clear. I turn to my colleagues, starting with Stephen Metcalfe.

Q402 **Stephen Metcalfe:** Before I go on to what I wanted to ask about, with regard to the recommendations that you provided to the Prime Minister and the Secretary of State at BEIS, was it your decision not to publish or was it a direction from the Department not to publish? You may have said this, but I did not catch it.

Simon Bowen: It was policy advice. Therefore, it was a report that was given to them. I never asked the question. I have asked whether we can share the recommendations. The answer is, "No. This is policy advice."

Q403 **Stephen Metcalfe:** Fine. That is very clear. I want to talk about skills, which you touched upon in some of your answers to the Chairman. This is a world-class programme, hopefully, which will require world-class talent. We recognise that we have some excellent capability in the UK, but perhaps not the capacity. As well as recruiting from outside the UK and within this organisation that, presumably, will be able to pay globally competitive salaries, how are we going to grow our own UK talent to be able to deliver 24 GW by 2050?

Simon Bowen: That is the key question. We did a substantial amount of work on skills as part of the sprint. You cannot consider new nuclear in isolation. You have to consider nuclear with the regulators, with the NDA and, critically, with defence. Mark Foy and I spent some time together a little while ago, when Mark supported us in the GBN work.

Q404 **Chair:** Mark Foy, from whom we will hear next, is the head of the Office for Nuclear Regulation.

Simon Bowen: We have done a number of things. I will come to the work that the industry will do in a second. The first thing that we have done is pull together defence and the civil nuclear teams to say, "How do you tackle this as one?" At the moment, we are just shifting people between the various sectors, and all that is happening is that the salaries

are going up. We have to consider it in totality. We are looking at how we co-ordinate across all of the sector. I will talk about that in a second.

Crucially, what we cannot do is continue to operate in silos. One of the main things that Mark Foy and I are currently setting up is an initial meeting between all the chief executives and Department leads who have a substantial nuclear workforce to say, first, "How would you collaborate across the industry so that we can attract apprentices, graduates and mid-career people together, so that when they want to move they move within the industry and are part of the industry? How do you form that and make it work?"

In new nuclear more specifically, one of the key roles of GBN will be to make the best use of the existing talent that we have—not to form something like British Energy, but to form a collaborative grouping of all of the capabilities that we have, because there are substantial numbers of people. If you operate it as a system and think about moving the capability from Hinkley to Sizewell and then into the rest of the programme, that utilisation of the capability, with some central organisation in which we can house that capability, starts to address some of the capacity issue, but it does not address it all.

The report says that we need to recruit somewhere between 75,000 and 150,000 people. If you get the productivity sorted and get much more offsite manufacturing and more modern manufacturing techniques, we think that the number is much more likely to be 75,000. However, we are in the early stages of working out, first, how you collaborate as an industry to do this together and do not compete, and, secondly, how we work with Government and the DFE to make sure that the right educational skills and the right STEM objectives are being followed by the totality of the industry.

All of those are grand plans. What we really have to do now—this is the next stage of it—is get into specific actions. We have done a lot of data analysis and observing of this problem for the last five to 10 years, and there are a number of places where people are in action. We have to get in action as an industry.

Q405 **Stephen Metcalfe:** Okay. What should we be saying collectively to young people who are now making their choices for GCSEs and A-levels so that in 27 years' time, when we get to 2050, we have our own home-grown, experienced, global-class talent? What should they be studying? How do they get access to these apprenticeships? When can you offer them?

Simon Bowen: That is a fantastic question. The industry is doing a huge amount on STEM. It starts much earlier, doesn't it? There is a lot of work within industry, some of which is collaborative and some of which is fairly siloed, that is all about influencing young people—from the age of five upwards—their parents and the teachers. All of that work is going on

within the industry. This collaboration effort is going be about how you accelerate that and make it more collective and integrated.

The nuclear industry has an image problem. You can dress it in whichever way you like—we do. Can we compete with the likes of McLaren to bring in software engineers? Probably not, because McLaren is seen to be something that is more attractive. I am just using it as an example.

We have a lot of work to do. One of the things we are talking about across the industry is how you make it so that we are attracting more people into energy—energy security, energy provision, net zero and low carbon—and the fact that it is nuclear is a subsidiary conversation.

There are a lot of image issues we have to deal with in nuclear, which we are tackling. We are encouraging the young people in the industry to get out—there is no simple answer: it is all about the young people getting out to the universities and the schools to get them educated in what nuclear is all about.

Q406 **Stephen Metcalfe:** You are completely right about the language that you use. If you talk about net zero—and nuclear plays a part in that—it is probably more attractive than talking about nuclear in and of itself in attracting people to the sector.

You are absolutely right when you talk about starting young, but I would make sure that the net is as widely thrown as possible—that it is not just around existing nuclear sites. You are going to need to bring people in from outside, aren't you?

Simon Bowen: Yes, you are. There is a degree of nuclear snobbery. I can say this because I have been part of the industry for a long time. We do make it a little bit special—and it is not. There are very few skills that are specific nuclear skills. The industry is dominated by general engineering, project management and safety case skills, which you can bring in from multiple industries. We are doing so very successfully. We just have to up the numbers, but we must not create a problem elsewhere. It is about growth of science and technology across the piece.

Q407 **Stephen Metcalfe:** Absolutely. You talked about parents, influencers and getting out to universities. Of course, teachers are some of the biggest influencers. Please think about how you influence them to understand what nuclear can do.

I am going to move on because otherwise we will run out of time. You talked about finance. I want quickly to understand how you are going to ensure that there is a system fit for purpose to finance this. Who are you going to talk to? How is it going to work?

Simon Bowen: The initial premise is that we did a lot of work on the RAB, which is a very robust and appropriate mechanism to fund new nuclear. Our view currently is that RAB and the CfD format will be part of that, at least for the initial projects.

The key thing that we have to consider is that the funding model must be seen as a circular model. When the Government put money in, it is not grant funding, but funding that is put in to invest in the development of the technology. The expectation should be that there will be conditionality attached to it. We have to get much smarter about the conditions that we put on our investment—that money has to be spent in the UK, in the development of the UK supply chain. We then have to say, "At the point of financial investment decision, when you get private finance in, Government finance needs to come back out and to be recycled in."

As you will well know, the crucial point is that it is not just about the fiscal amount—it is about who takes the risk. In the early stages of these projects, unfortunately, a lot of the risk—early development risk, construction risk and, indeed, some of the operating risk—will sit with Government. The benefit of some of the SMR technologies is that if you can roll those out quickly and get confidence that you can build them to time and to budget, that will attract private finance at low interest rates because it is an investment for which you can manage the risk.

For me, it all comes back to the programme, based on the existing financing models that we have. The whole game now has to be about how you get private financing in at an affordable level. Finance will take risk. There will just be a very high premium to it at the current stage of the early-stage projects, if that makes sense.

Stephen Metcalfe: It does.

Q408 **Aaron Bell:** Mr Bowen, thank you for your evidence today. May I follow on from the questions that the Chair was asking earlier about the shape and structure of Great British Nuclear? You said that you took evidence not just from here but from abroad. Which is the closest parallel abroad to what we are trying to do with Great British Nuclear?

Simon Bowen: Gosh. That is a great question, because everything is very different. The French model is really interesting, but it is very Government-dominated. There are a number that we have taken. The Emiratis have done it in a very interesting way because they have grown it from absolutely nothing. We have had a good look at that. Then you look at the developing eastern European structures. Although they are probably a little bit behind us, all of them are saying the same thing—that you need very clear Government leadership.

Probably the most consistent thing that we heard was that it would be very helpful to have a single Minister who has authority over not just the nuclear programme but the enablers—things like consenting and putting environmental in the context of energy security. The clear advice is that you should have a single point of accountability in Government that has authority over all of that.

We talked to Canada and the US. Their models are subtly different, and we would have to morph them back into what we think is fit for the UK.

What we believe to be fit for the UK is an arm's length body that drives the programme, with a single point of accountability into a Minister who has the authority across the enablers, and that has capability in—critically—programme management, finance, regulatory and skills.

Q409 **Aaron Bell:** What sort of headcount do you anticipate this having? What would the management structure of this arm's length body be? Would a board be set up, with a CEO and all the rest of it, as you would expect?

Simon Bowen: That is exactly right. It will have an independent board, with a chair and independent non-execs with the skills that I have articulated to reflect that. We will need a lot of capability in how you set up an organisation like this successfully. It will have a chief executive. I will talk about the structure in a second.

We have spent a lot of time debating with industry what headcount we think is appropriate. We think that keeping the headcount below 100, in time, is the right thing to do. Where would it be initially? There would probably be 30 to 50 in the first couple of years, ramping up as the programmes ramp up to about 100, but with a lot of people seconded into the projects and then cycling back around as they have learnt.

What structure will it have? It will have a not untypical company structure, with a chief executive and, obviously, a chief financial officer. There will be a chief people officer, because recruitment of people is going to be very important, and things like a head of programme, a head of technical and a head of regulatory affairs—that type of structure.

Q410 **Aaron Bell:** Obviously, the overall objective is 24 GW by 2050, but how will we measure success along the way? What are the milestones we are looking for?

Simon Bowen: I think that there are some very short-term milestones. If you are going to set up an organisation like this that is championing a programme, it must put deliverables into the industry that it has to hit. The short-term deliverables and short-term measures will all be around the four priorities I have talked about: set-up—how you set up the technologies; what work you do on siting; and, then, what you do on funding. There will be specific deliverables on those.

As the programme matures, there will be project-specific deliverables that will obviously be dominated by safety, cost and time. Then you have the programme deliverables, about the pace at which you are getting the gigawatts on to the grid. It is that type of structure, but it would be what I would class—because that is what my experience is—a classical corporate performance management structure, with very clear deliverables. The only difference is that those deliverables would be very public.

Q411 **Aaron Bell:** Finally, how is Great British Nuclear going to ensure value for money for the taxpayer throughout? How core is that going to be to the agenda?

Simon Bowen: It has to be core, because otherwise we will not be trusted to spend the money we need. The whole reason for getting real, deep expertise is: what is the value for money going to be driven by? Project delivery. This is all going to be about on-time programme and project delivery. The value for money will be driven by our ability to oversee and support the projects and, critically, to intervene when they are going off track—not to a point of just saying "Stop, and come back and tell us when you have fixed it," but to say, "How do we now fix this, to get this back online quickly?" The critical piece, for value for money, for me, is fleet. You build it, you design it, you check the design and you don't change it. You replicate. That is what will drive value for money.

Q412 **Chair:** Is 24 GW by 2050 attainable?

Simon Bowen: It is stretchy, and, yes, it is attainable, but we need to start now. Every day you lose, you are losing the opportunity to deliver that.

Q413 **Chair:** Within that, do you have a view on the mix of types of reactors—gigawatt-scale, small and advanced modular reactors—that would deliver that?

Simon Bowen: Yes, I have a view, but it is a personal one. This is a big piece for policy space, which needs to be decided. This is why I said earlier that with this integrated plan, when you look at wind, solar and nuclear, we need to be clear about how much we want. If we want up to 24 GW, you will have to have gigawatt-scale, in my opinion, as well as SMRs.

I think it is a mix. In my mind we will need more gigawatt reactors, and we have to get on with the SMR programme, and then, in time, get into the AMR programme. Energy security is all about scale. Therefore, we will have to look at how you get the biggest scale that you can get with the SMRs, but the SMRs do offer a real opportunity and we cannot do that without gigawatt, so I think you need both.

Q414 **Chair:** In your personal view—and I recognise it is not the Government's view, but to help the Committee think about this—how many gigawatt-scale reactors would you expect or think would be optimal by 2050?

Simon Bowen: This is really subjective, because we do not have the overall plan, but it makes perfect sense to build at least another two sites. Where those would be is subject to debate.

Q415 **Chair:** Beyond Hinkley—so, besides Hinkley, one?

Simon Bowen: So you end up with—yes—Sizewell plus another two.

Q416 **Chair:** Plus another two?

Simon Bowen: Plus another two, in my view—if you are committed to 24. If you are committed to a lower number, then possibly one more site would do that. I think you foreclose on a number of options that you

need, in terms of electricity generation, because I think the 24 number is quite light.

Q417 **Chair:** And the balance of that would be SMRs.

Simon Bowen: SMRs and then AMRs. Some of the AMR technologies are developing very fast. We as a nation consider the two separate. Actually, they are one and we would need to be flexible enough to include both of those. The AMRs obviously have more interest in terms of district heat and direct electricity for industrial use.

Q418 **Chair:** In terms of the technology used for gigawatt scale, you were referring to Aaron's point about value for money: is it not the case that value for money comes through the repeated application roll-out of a standard, tried and tested design, rather than diversity?

Alternatively, I suppose competition is another way to get value for money, but between those two forces of consistency versus diversity and competition do you have a view on how they should balance out?

Simon Bowen: I think there is a case for both. It is a combination. Competition helps. Do you want a deeply long, competitive process? No, but the resilience of the grid: having two designs of reactors—of course that makes sense. All you have to do is look at the problems that we have had in France.

I think there is a case for both. That does not mean for one minute I do not think we should build more of the EPRs, but I do think we need to cast the net wider and look. I certainly would not write off things like looking again at Sizewell B. Sizewell B is a very successful PWR reactor, and why wouldn't you look at building more of those? Again, that is a personal opinion.

Q419 **Chair:** Given that we know that there is a discussion, perhaps even a tussle, within the Government, over how much can be afforded for this, my experience—I may be a bit jaded on these things—is that sometimes, if people do not want to commit the money, one way of doing that is to kick down the road and delay the necessary reports and structures that are required to put that money in. Do you think that is part of the delay in publishing and responding to your recommendations?

Simon Bowen: I couldn't possibly comment.

Q420 **Chair:** You have been extremely helpful, Mr Bowen, and I am very grateful, as I think we all are, for your evidence.

Examination of witness

Witness: Mark Foy.

Q421 **Chair:** Mark Foy has already been referred to, having had a curtain raiser from the first witness. He is chief executive of the Office for Nuclear Regulation, the ONR, and is the UK's chief nuclear inspector. Thank you

very much indeed for coming in and helping the Committee with our inquiry.

Obviously, you have a very important role. Would you briefly summarise the responsibilities of the ONR, in two respects: assessing life extensions to current reactors and the approval process for new nuclear technology?

Mark Foy: For clarity, the Office for Nuclear Regulation is an independent regulator. It regulates the nuclear industry from a safety, security and safeguarding perspective. Safeguarding is around nuclear material accountancy—so special nuclear material and how it is controlled.

In relation to new build, we focus very much on doing two aspects: assessing the designs of reactor technologies that are proposed for the United Kingdom, but also licensing the deployment of those reactors to specific sites within the UK.

With regard to lifetime extension, which you mentioned, we have a key role in ensuring the continued safety of the existing fleet of nuclear reactors. I have a team of specialists that take continual assessments of cases that are submitted to the ONR that justify the continued operation of those reactors.

The AGR fleet suffers from an ageing phenomenon at the moment, in relation to the graphite cores. That ageing phenomenon will be the life-limiting feature for those reactors. EDF has currently shut down Hunterston B and Hinkley Point B, because of that phenomenon. I am aware that it is considering lifetime extensions for the remaining fleet of AGR reactors.

To do that, it has to demonstrate to us, as the independent regulator, that the reactors can continue to be safely operated in the light of the ageing phenomenon that exists within the graphite cores. The cracking increases the longer those reactors continue to operate. We are looking to ensure that at all times the reactors can be safely shut down.

EDF is considering—it is EDF's decision—whether it wants to make the case for lifetime extension. We have been very clear with EDF that we will consider any case it wishes to make with regard to extending the life of the current fleet of operating reactors, but we will be looking for that really clear justification that they can continue to be safely operated.

Q422 **Chair:** Thank you very much indeed. Referring back to the previous evidence that we heard, around having a single point of accountability, and avoiding silos, at the moment your line of reporting is through, I think, the Health and Safety Executive—through the Department for Work and Pensions. It goes to a different Minister from the BEIS Minister. Is it envisaged, in the conversations that you have been having, that they will be, as it were, rationalised, and there will be a single Minister, or would you continue to report to a different Department and Minister?

Mark Foy: In relation to the discussions around Great British Nuclear, we have been intimately involved with all the work that has been done. As the previous speaker, Simon Bowen, indicated, we have had significant input into the discussions around siting, licensing, regulation and the recommendations that have come out, and I have been part of that independent advisory group that stood back and looked at how it is being developed, in terms of the thinking and subsequent recommendations. So we are aware of that, and the proposals that have been put forward.

With regard to regulation, there is nothing there in regard to changing our line of reporting and sponsorship into Government. That current arrangement reflects global standards and expectations. The International Atomic Energy Agency, which is based in Vienna, sets the global standards for nuclear safety, security and safeguards that all member states look to comply with and achieve. The UK is no different from any other member state in that regard.

One of the fundamental principles is to have independence of the nuclear regulatory body. That independence includes independence from any organisation that has an interest in sponsoring, policy decisions and delivery associated with the nuclear programmes within that country. By having that clear line of sponsorship through the Department for Work and Pensions, we are somewhat removed from any influence from BEIS or any other Government Department—the Ministry of Defence—that has a role to play in delivering nuclear within the United Kingdom.

Q423 **Chair:** The implication is that you approve of that arrangement and you would not want to see it changed.

Mark Foy: Very much so. Discussions have taken place on this in the past, but, as the UK's independent regulator, we are subject to scrutiny and peer review internationally. Indeed, a team of authoritative experts came to the UK in 2019 to look at the UK's legal and regulatory framework for nuclear safety. They look at the independence of our role. I have led such missions myself, and one thing that we do is ensure that the regulatory body is not able to be subjected to undue influence with regard to nuclear policy in that country.

Q424 **Chair:** You have got the structure aspect of that, and it is notable to hear you say that you want that separation from the energy Department to continue, but, clearly, the nuclear community is a very small one, and everyone knows each other, and in participating in the thoughts around GBN you are quite intimately involved in conversations. Is there a danger of, as it were, socialisation: that—I am certainly not accusing you of this—a certain groupthink develops and you have to be careful not to be too close to the rest of the industry?

Mark Foy: Our regulatory philosophy is what we call an enabling philosophy. I have no qualms about saying that we will work with the industry to try to support it to achieve its outcomes—the goals that it seeks to achieve—but we are there to make sure that it does it safely and

securely. Everything that we do—my inspectors and my teams—is predicated on our mission, which is around protecting society by securing safe and secure nuclear operations. That is everything that we do. It is how we focus our activities and interventions.

I will acknowledge that one of the pipelines for people coming into ONR is the industry itself; but we have quite a range of diverse pipelines into the organisation. We do not just take people from the industry. We take people from other regulatory bodies, as well—but also from other industries.

We are quite keen to continue to benchmark our practices as a regulator. I chair the UK health and safety regulators network, which meets regularly and involves various chief inspectors across various sectors—the CQC, MHRA, Civil Aviation Authority, the Office of Rail and Road—and if any one of us has a particular challenge that we have to consider we will bring that issue into that body of individuals and debate and discuss it, and look to make sure that we all learn from their experience.

Chair: Thank you very much. Let me turn to my colleagues, starting with Dawn Butler.

Q425 **Dawn Butler:** You mentioned life extensions. Can I clarify something? We have been told that there is not a single life extension case for the ONR to review. With the imminent drop in nuclear power generation, is that right? If it is, does it require reviewing?

Mark Foy: It is correct. As yet, we have not received a case from EDF Energy Nuclear Generation Ltd for the life extension of any particular advanced gas-cooled reactor. They are considering it. Indeed, we had a senior-level meeting just this week, where they indicated that potentially they will be coming to us seeking lifetime extensions for a number of their reactor sites. We are open to that. We are quite happy to consider the case. Indeed, we are not working in isolation with EDF. As they develop their thinking, my inspectors and teams engage with EDF in what they are thinking and how they are looking to make a case; but we have not had one formally presented to us just yet.

Q426 **Dawn Butler:** If we are going to reach our aim for nuclear, do we need more than one operator?

Mark Foy: That is not a question for me, but I will recognise that currently there is only one operator for nuclear reactors in the United Kingdom, and that is EDF Energy Nuclear Generation.

With the new-build ambition that has been expressed by Great British Nuclear for 24 GW by 2050, there will have to be more than one operator, I suspect—but that creates opportunities. There are other global operators of nuclear facilities and they have the opportunity to come into the UK and be part of a project—a proposal—to deploy nuclear reactor technologies in the United Kingdom. Indeed, our philosophy of enabling is that, once those prospective operators are identified, we are

more than happy to sit down and work with them to let them know what the UK framework is like, what opportunities there are for them to come into the UK, and what our expectations are as a regulator.

Q427 **Dawn Butler:** You are happy to sit with them and talk them through it. Do you anticipate any challenges with that?

Mark Foy: There will be challenges with regard to any organisation coming into the UK and wanting to work or operate in the UK context. It is our role as a regulator to make sure that they have the best opportunity to learn what that means, from a regulatory perspective, and to provide us with the assurance that they have the capability to operate any nuclear facilities safely and securely.

Q428 **Dawn Butler:** Finally, we have received evidence that the exacting requirements for becoming a nuclear site licensee, such as being an intelligent customer, are a barrier to entry to the UK. Is that your experience?

Mark Foy: There are two aspects in relation to our regulatory approach. One is design assessment. Generic design assessment was developed over a decade ago via ourselves and the Environment Agency. We did it in partnership and, indeed, we undertake that assessment in partnership with the Environment Agency. That is not site-specific. It is a generic design with bounding parameters, and we undertake that assessment. That has advantages, in so far as a site for deployment of that reactor technology does not have to be identified, so we can continue with that assessment and complete it. At the end of that assessment we will identify whether we are satisfied that the design, from the assessment that we have done, can be deployed safely in the United Kingdom.

Aside from that, there is licensing. The UK's legal framework under the Nuclear Installations Act requires any operator of a nuclear facility, which would include SMRs or gigawatt-scale reactors, to be issued with a licence. That licence is issued to a corporate body. It is issued for a prescribed activity, such as operating a reactor, and it is on a defined site in a defined location. As part of our regulatory process, before I sign and grant a licence to any particular organisation to construct, operate and eventually defuel and decommission a nuclear facility, we have to be satisfied that that organisation can discharge its responsibilities once it is granted the licence. We will look at the organisation's capability, its processes and procedures, and the prescribed activities that it wants to undertake. We have to be assured, as the regulator acting on behalf of the UK public, that it can operate and discharge those responsibilities satisfactorily—because if it cannot, potentially it may compromise safety and security.

We will work with potential operators—potential licensees—to ensure they get to where they need to be. Indeed, we are in the middle of that process with Sizewell C at the moment. An application for a licence to construct and operate the European pressurised water reactor design at

Sizewell C has been received, and my team has been assessing that application to make sure that there is an adequate organisation there to discharge its safety, security and safeguarding responsibilities.

As for any other organisation that wishes to come into the UK—because EDF is here already—we will work with it to ensure that it gets to the same position that EDF has been able to get to for Hinkley Point C, and that it is working towards for Sizewell C.

Q429 **Dawn Butler:** You sound as if you are happy with the procedures. You have no plans to change what the team currently does.

Mark Foy: There are opportunities. If we are looking to try to expedite completion of the generic design assessment, there are synergies for international collaboration. I have been quite instrumental in working with the US and Canadian regulators to try to identify a path to greater collaboration around design assessments. That will provide benefits. They will be technology-specific. It requires each member of that trilateral co-operation to have the same technology deployed in their country. If the Canadians are progressing a particular technology and have done the assessments, I do not particularly need to do those assessments again; so I would be using them—a fellow regulator—effectively as part of the supply chain to provide me with their assessments. I do not have to spend the time and money to complete the assessments to inform my decision around generic design assessment.

With regard to licensing, again, we are continually looking at every opportunity we have to expedite improvements in that process. We have modified the generic design assessment process over a number of years. We established it a decade ago, and we have evolved it with time. It was a four-step process. We have changed it to a three-step process now. It is much more aligned and flexible, because of the different maturities of the SMR technologies that have been proposed for the UK. It allows the vendors of those technologies to take a step back once they get to the end of a particular step, further develop the maturity of their design, and then come back into the process if that is what they desire.

It is similar with licensing. We are continually reviewing licensing to make sure that it is the forefront of good practice that is reflected elsewhere across the globe.

Q430 **Christian Wakeford:** Sticking to the theme of licensing, does the ONR have enough resource and capacity to deal with multiple applications through the GDA?

Mark Foy: We maintain good contact and liaison with BEIS and with the industry, Great British Nuclear, so we have full awareness of what the ambitions are from the civil sector; but the demands in the military sector, within defence, also need to be considered. There is significant investment there. We regularly review the environment and the horizons that we will be working in, in the immediate term but also in the long

term. I am satisfied that we have sufficient capability effectively to regulate the industry as we currently understand and assume it will be shaped.

In terms of new-build activities, we are aware of the defence programme, and are geared to regulate that effectively. We have made assumptions with regard to the shape of the new nuclear sector. Again, we are resourced with capability and capacity to do that, through generic design assessment and licensing. Those assumptions—just to be clear about what they are in the immediate future—are continuing with Hinkley Point C and Sizewell C regulation, and the generic design assessment of the Rolls-Royce SMR design. We are also assuming that we will be asked to undertake a number of generic design assessments for some of the SMR technologies that are currently being considered for entry into generic design assessment by BEIS.

Q431 **Christian Wakeford:** So you do not see any issue whatsoever with an increase in SMR—

Mark Foy: It is not a competing market at the moment. Should GBN gain momentum, it will be increasingly competitive. I would say that the attrition rate for ONR has been low for decades. We are in the very low single figures for attrition. We do not have difficulty in recruiting experts. We have just done a recruitment campaign. We have in the order of 420 inspectors. We have just recruited or put offers out for 25 new inspectors to come into the organisation. The process was so successful that we actually have a waiting list for inspectors. That gives me some degree of confidence that, should we have to increase demand significantly, particularly in the short term, we will be able to achieve that.

Q432 **Christian Wakeford:** Many of those who have made submissions to the inquiry have highlighted the fact that they believe there is a lack of resource in appropriate regulators. What would you say about their comments?

Mark Foy: We recognise the concerns of the industry with regard to that ongoing capability capacity to support what would be a significantly ambitious programme for new build in the United Kingdom. We believe that we are geared to that.

Simon Bowen identified the challenge. One of the challenges to successfully delivering a new-build programme is skills and capability. I include ONR, as the regulator, in that. We would have to be part of that broader consideration, because, as I said, the market at the moment is not particularly competitive. It will become increasingly competitive, and we need to make sure that we have access to the appropriate resources to enable us to work effectively; but I have no immediate concerns.

Q433 **Christian Wakeford:** What conversations or dialogue are you having with other Government Departments or agencies about, perhaps, their lack of resource which could also cause a detrimental impact? I think

specifically of the Environment Agency, which highlights that it believes the GDA takes significant regulatory resources, and that it is important that they use their resources effectively, which, again, highlights various possible concerns if there is an increase in applications for SMRs.

Mark Foy: The resource in the Environment Agency, unfortunately, is a matter for the Environment Agency. I have sympathy with their position, but my focus is to make sure that the Office for Nuclear Regulation, as the independent regulator, is able adequately to regulate and ensure the safety, security and safeguards of the industry, be it the existing industry and the AGR fleet and lifetime extensions, or what is planned in relation to the new-build activities.

Q434 **Christian Wakeford:** You did touch on some other work that you had already undertaken with regard to Canada and the US, in international collaboration with regulators. How is that going in improving our relationships and streamlining some of that process?

Mark Foy: The relationships between us and fellow national regulators are extremely good and healthy. I mentioned the US and Canada because they are like-minded regulatory bodies—particularly the Canadians. Their arrangements are not too dissimilar to our own. I think better synergies will be achieved through working with like-minded regulators. We have bilateral arrangements with the UAE; FANR is the regulator there. We have good relations with ASN in France. As they start to develop their thinking around SMR deployment, we will work together to identify where we can co-operate and collaborate much better.

With regard to that ambition and how we can be better facilitated, it has to be around technology-specific applications. The IAEA, as the global setter of standards, is currently looking at what is called the nuclear harmonisation and standardisation initiative. That is a much more ambitious programme for global harmonisation with regard to how you undertake these assessments and license SMRs. Again, we are very much front and centre of that, but, to my view, it is a much more long-term ambition. I believe that greater success and greater synergies, and efficiencies, can be achieved by working in more bilateral and trilateral arrangements.

Q435 **Christian Wakeford:** Obviously, the likes of Cavendish Nuclear and the NIA have been talking about greater global harmonisation, very much in line with what you were saying about the IAEA. To what extent do you think—obviously as a long-term aspiration—that we are leading from the front, and not just sitting around the table? Do you think that we could have more of a short or medium-term goal—especially aiming for that 2050 target—that is not just limited to bilateral and trilateral agreements?

Mark Foy: In relation to the technologies that are likely to come to the fore, I think bilateral and trilateral. Our assessment is that if BEIS determines that two or three technologies need to go through generic

design assessment, that work will be done in the next four years, or thereabouts.

The global initiative by the agency will take much longer to achieve some success. My belief is that if we work in much smaller testing and trialling, with whichever national bodies, in groups of two or three, that has the best chance of success. From that small seed, I would hope that greater global co-operation started to manifest itself. I believe that if we are successful in those smaller groups it will inform that global agency initiative. It has to.

Q436 **Christian Wakeford:** As a final question, do you see any drawbacks in having the bilateral conversations in smaller groups while there is this wider conversation taking place? Granted, we are sitting at the table for those conversations, but is there any fear that we may potentially be missing a trick or being held back slightly?

Mark Foy: We are involved in all the activities, globally, from a regulatory perspective, where co-operation and harmonisation are being discussed. Even within Europe we are involved in those discussions. There is a group of European regulators under the European Commission. We were involved in that until Brexit. However, we still maintain observer status, so we are involved even in the work that is being undertaken in Europe on various technologies and that co-operation. That may indeed present an opportunity for the UK technology at some point in the future.

Q437 **Chris Clarkson:** Thank you for coming today, Mr Foy.

How can the ONR improve the licensing of new nuclear power plants? Specifically, we have heard from some developers that, for example, running processes such as site licensing and development consent in parallel could streamline the process. I would be interested to know your thoughts on that.

Mark Foy: That is a really opportune way to streamline the process. We are not creating any shortcuts, or anything like that. You are still doing the robust generic design assessment, and assessment of the design, but commencing licensing at the same time really helps to shorten the timescales to achieving the licence and then being able to deploy the reactor technology on the site. At the moment, the practice has been for us to complete the design assessment and then commence licensing of the organisation. There are real opportunities there, and we are open to that.

The challenge is the capability in the organisations. Generic design assessment timescales are normally dictated by the maturity of the design—some of the technologies that have been talked about in the past have been relatively immature—and by the capability of the vendor organisation to submit the documentation that is required. That is not just the experience in the UK. It is the experience elsewhere of colleagues in other countries.

Likewise, with licensing, it is about developing a capable organisation to hold the licence. That requires us to work with potential licensees and potential vendors of these technologies early, to ensure that they get the right insight and are able to take the right decisions, and when they come to the table with their design or submit their licence application they get off to a good start.

Q438 **Chris Clarkson:** Picking up on the idea that how mature the technologies are affects the process, how close are advanced modular reactors to entering the regulatory process, such as the generic design assessment?

Mark Foy: The designs that have been proposed thus far are what we term small modular reactors. They do not particularly affect that advanced modular technology. We have been working with vendors. We have entered into some early discussions with the vendors—probably around two years ago—on advanced nuclear technologies to set out the regulatory framework and what the expectations would be, and so we could check on the maturity of the designs. They are some way off.

Through my involvement with Great British Nuclear, I recognise the strategy that has evolved out of Great British Nuclear, and it does talk about a gigawatt and small modular reactor mix, recognising that the UK should potentially commit to something that it can deliver in the short to medium term. Then the advanced modular reactors will perhaps come further down the line, as those designs begin to mature.

Q439 **Chris Clarkson:** Has pre-engagement as a result of the AMR feasibility and development competition improved the timeline?

Mark Foy: We were party to that. We had significant input into it. That is part of the discussions that I was talking about. I believe that it is helpful for the vendors of those technologies to understand what is required for the UK. As to where they are now with regard to that continued development of their strategy, I do not have that information.

Q440 **Chris Clarkson:** Finally, you mentioned that the focus has been on SMR, for obvious reasons. We have heard previously that there is not that much of a difference in the technologies between SMR and AMR, so are there any synergies that you can pick up from the process with SMR?

Mark Foy: Some of the technologies that are under the SMR banner do have features that you would expect to see in those advanced modular reactors, so what we are looking for as the independent regulator is inherent safety—passive safety features—such that if fault conditions were to occur in that reactor design they would safely be curtailed and the reactor would shut down safely. Some of those features are present in the newer designs, but the AMR designs take it that step further.

Chair: Thank you, Mr Foy, for your evidence today. It is authoritative and very helpful for the Committee to hear from you in person.

Witness: David Peattie.

Q441 **Chair:** Our next witness is David Peattie, the chief executive officer of the Nuclear Decommissioning Authority. Thank you very much indeed for joining us today.

May I start by noting the huge scale of financial requirements in nuclear decommissioning—decommissioning and dealing with safeguarding the legacy of the UK's nuclear industry? What sums are we talking about in your budget, Mr Peattie?

David Peattie: Thank you, Chair. It is a pleasure to be here, particularly in person, to give my evidence to the Committee, so thank you for that.

I think there are two key facts. The provision in our accounts for the total cost of decommissioning the 17 legacy sites, stretched back over 80 years, is just a little bit over £148 billion. This is over 110 years, and of course you will appreciate it is very difficult to estimate the costs that far in the future. Nevertheless we are duty-bound to lay out in our accounts every year what we think it is likely to cost. That is, I think, the overall scale of it. I can talk about how that is broken down in due course.

The other simple key number to remember is the annual spend of taxpayers' money. That is between £3.5 and £4 billion, although, of that, in the last few years we have been earning between £600 million and £1 billion per year in revenue, because of the work we do helping to keep the lights on in the UK with the fuel from the AGR reactors, and, indeed, the work that we have done for many years with customers such as Japan. We are not just a cost centre. We do earn important revenues, given the skills that we have developed over the decade, but we do draw down a significant amount from the Exchequer each year.

Q442 **Chair:** We will come on to the commercial and international opportunities, but how do you go about securing value for money, as chief executive?

David Peattie: As chief executive and, indeed, as the accounting officer to Parliament, which is a very important distinction: as CEO I work for Government, and as accounting officer I am accountable to Parliament, and I very much welcome that.

I will pick three points, if I may. I conduct accounting officer reviews every quarter, with all the businesses in the portfolio. I have extensive experience, over many years, of major capital programmes and projects, and operational costs at multi-sites. So there is that level of scrutiny. Of four major operating companies, each has independent boards of directors, who provide further scrutiny. Then, of course, we have the board of the NDA, scrutiny from the Department and from the Treasury, and the value for money studies done by the National Audit Office on behalf of the Public Accounts Committee, which I regularly attend.

In terms of budget requests from Treasury, we never get as much as we ask for, although in this most recent spending review 21 period, over this three years—we are in the second of three—we have had the highest level of funding that the NDA has ever had. That is obviously to be welcomed, but of course we still have to manage that budget very carefully. It gets a lot of scrutiny—rightly so—and we will keep pushing on that, and how we can develop more technology to improve our delivery and cut this overall cost. None of us wants to see this £148 billion spent, right? We want to see how we can minimise that and deliver the best outcome for the taxpayer. Nevertheless, we are looking after 80 years of legacy: buildings, sites—17 sites around the UK that were built in the immediate aftermath of the second world war, when the context was very different and the notion of clean-up and decommissioning was not in the minds of the people developing the civil nuclear sector here in the UK.

Q443 **Chair:** There is a lot that we can talk about, but you will have heard and will know that our inquiry has been considering the likely expansion of our nuclear operations in this country. That is going to produce waste, which will come to you, in addition to the legacy waste that you have. Sellafield, in advance of a geological disposal facility, is where this tends to end up. Can Sellafield cope with the additional nuclear waste that will be generated by new nuclear activity?

David Peattie: Yes, we think it can. We do have spare capacity in some of the facilities that I know you have seen, Chair—the ponds. Those are not just the very old outdoor concrete ponds, but the newer indoor storage ponds, and the huge Olympic-sized swimming pool of highly engineered storage systems in water. By more tightly packing when we store waste and material from reactors, we can get more stuff in the existing volumes.

The future generation of reactors should develop much less waste, because decommissioning is now part of their design, which historically it was not.

Yes, we think we can handle the volume, and of course ultimately a geological disposal facility is planned for the future.

Q444 **Chair:** To take one of those, in particular, obviously Hinkley Point C is under construction. That will, over time, generate nuclear waste. Can you accommodate it within your existing ponds, or are you envisaging the construction of new facilities to accommodate that waste?

David Peattie: We are, right now, building facilities for dry storage in very large warehouse style: very heavily engineered warehouses. If you imagine a box, a 3 metre cube, thousands of these will ultimately be stored in the geological disposal facility.

For the currently producing reactors, the AGRs, which will be coming to the NDA in due course, once they have been defuelled, we are confident

that we have the space for those—and then Hinkley C and Sizewell C in due course.

Q445 **Chair:** And the nuclear waste that you have, especially the new additions to it, is held securely in every respect, from an environmental point of view, but also a national security point of view—use by a hostile state actor, for example. You are satisfied that the arrangements that you have in place are highly robust.

David Peattie: Yes, we are. You will be aware that at some of our sites we have the support of the Civil Nuclear Constabulary, which is an armed police force. We have the most secure sites in Europe—particularly Sellafield and Dounreay in Scotland—so I am confident we have the security and safety measures in place to handle that.

Q446 **Chair:** Given that those sites, and in particular Sellafield, have held nuclear waste for well over 50 years now, and that by the time a geological disposal facility is built and operational there will probably be a century of waste there, do we need a GDF? If your arrangements are sufficiently robust, is it necessary to have a GDF to have this expansion of nuclear activity?

David Peattie: It is a really good question. It is one we have thought about extensively over many years. The simple answer is yes, but let me explain why.

The leading countries in the world are ahead of us—and it is great that you were able to have witnesses from Finland and Sweden: you will have heard how far advanced they are. The first emplacement in Finland could be as early as in the next year or two. The internationally accepted best practice now, for the very long term—and we are talking millennia here, not just decades or centuries—is to dispose of this material at up to about 1,000 metres underground, in geology that is reliable over that kind of time period.

The thought experiment is: "Is there some break-even cost where we just keep repackaging? We keep building new stores every 50 years—keep the skilled workforce in place and just continue to do this." Our sense is that this is going to run for so many decades and, literally, centuries, that we should get on now with the GDF and build it. It takes a long time—20 or 30 years—just to get it going.

Finally, there is the intergenerational point. There were two generations, really, in the so-called cold war period, and there is perhaps an obligation on our current generation: one more generation, to provide a proper repository. I think there is something to that. We have an obligation to our grandchildren and their grandchildren to have done something that is right for this material.

Q447 **Chair:** In engineering and technical terms, rather than, perhaps, moral terms, is it that we "should" have this facility rather than we "must" have it?

David Peattie: I think it is a must. For the legacy material we talked about at Sellafield, the right thing to do with that highly radioactive material, which will be radioactive for a very long time, is to package it up safely and put it in a GDF.

Q448 **Chair:** When I ask whether it is "should" rather than "must", one can conceive a case where it is desirable, but "must" indicates to me it is technically necessary and there is a danger if we continue in the way we have been doing it for the past 50 years.

David Peattie: I understand the question. It would be possible theoretically to continue to store this material safely, as we have done for many decades, at or near surface and keep monitoring it, going back to it, say, every 50 years checking it, doing an assay and repairing, repackaging and restoring it. You could in theory just keep doing that, similar to the Scottish policy approach, but we think that for England and Wales that is not the right approach, nor is that view shared by the international community and the leading countries which, frankly, are quite far ahead of us in this matter.

Q449 **Chair:** Is there a possibility that international consensus might establish itself around this? Could international regulation and norms move to prevent our adding new nuclear waste if we do not have a GDF? Is that a possibility?

David Peattie: It is possible, but I think unlikely because international authorities and regulators around the world—we heard Mark talk about Canada and the US—are all aligned around this solution being the right one for the storage of long-lived highly radioactive waste.

Q450 **Stephen Metcalfe:** You talked about Finland's progress with a GDF and that it is potentially only a year away from starting to store material. Why are we so far behind without any real or clear indication yet of timing or costings? There is quite a large range. When will we be able to narrow that down and get a clearer indication of what we can do, and when?

David Peattie: We are well advanced with our GDF plan. We had a hiccup about 10 years ago with an attempt in Cumbria to get on with it. Current Government policy, as you know, is to have a willing community, which is a key element to the timing. It is an essential part of the GDF that we do engage with the community that will be hosting this.

It is also important that we understand the geology. It is the geology that drives the cost. Currently, we have quite a large range of anticipated costs.

Over the next five to 10 years we will become very clear on where we believe the GDF should be installed. We will be engaging closely with the respective communities to seek their support, and then there is a period of detailed engineering design, build and placement. The plan is that in the 2050s—maybe a little bit after that—we will begin the first emplacement of material into the GDF.

Q451 **Stephen Metcalfe:** That is quite a long timescale and a long way behind where Finland is. Did it start 20-odd years earlier than us?

David Peattie: Yes. Typically, the period from start to emplacement is of that order. Finland started thinking about this 25 to 30 years ago, so it was very forward thinking.

Q452 **Stephen Metcalfe:** You think that within five to 10 years we will get clarity about location, timings and costings. Following on from the Chair's question about whether we should or must have this facility, what are the consequences if both the geological investigation and community engagement fail, or you cannot get either of those two aligned?

David Peattie: We are confident that there is good geology in parts of the UK to host the GDF. The geology of the UK is probably more studied than anywhere else in the world, particularly following development of the North sea oilfield. There is a huge amount of seismic data available for that part of the world. My team believes that technically we do have geology that should work. You are quite right to point out that we will have to do a lot of work on the current policy of community acceptance. I suppose that, ultimately, if a local community is not willing, the Government will have to review their policy around having a willing community.

Q453 **Stephen Metcalfe:** I suppose the question is: what happens if the two do not align? Say you have a community that wants it but the geology does not work, or the geology works but the community is unwilling. You have answered the second part of that. What happens if you have a willing community? What will you do? Can you change the geology? I realise that at one level that is a silly question, but are there engineering solutions that make it more acceptable?

David Peattie: You could incur extra cost. The engineering in less favourable geology could still be done, but it would come at an extra cost and probably take longer to do it, but that remains an option. I think that would be preferable to the Government shifting their policy and saying, "We're going to build it here and you have to have it." I do not think that is in anybody's interests.

Q454 **Stephen Metcalfe:** The community trumps geology.

David Peattie: They are both important.

Stephen Metcalfe: Good luck.

Q455 **Chair:** To go back to what you said about international opportunities and your making some commercial revenue, can you characterise that revenue? What is it for? How do you earn money internationally?

David Peattie: We earn money from EDF UK. I suppose that in a way that is international because it comes ultimately from French taxpayers. We have the world's leading maritime shipping business for nuclear material. We have three ships based in Barrow-in-Furness, and we are

world leaders. We have just done a move of mixed oxide fuel from France to Japan with two of our ships. Indeed, we are the go-to organisation for complex and difficult moves around the world. We have done it to Australia, Slovenia, the US and other European countries. That can earn us a good return for those ships.

Our captive rail company, Direct Rail Services, is a UK freight company. We have about 80 locomotive trains and a couple of hundred ASLEF members. Every day typically in the UK one train will be moving nuclear material around from the reactors to Sellafield and back again to help refuel.

We also have a contract with Tesco. You might see our trains on the west coast mainline pulling Tesco goods to keep them off the roads. Therefore, as well as keeping the lights on we help to keep the shelves full.

Q456 **Chair:** Specifically on the nuclear side of things, at Sellafield there was reprocessing of spent fuel from other countries. That has diminished, has it not?

David Peattie: It ceased last year after over 50 years of reprocessing. Sellafield now is concerned only—I say "only", but it is a massive task—with the safe stewardship of the special materials we hold there, as well as broadfront decommissioning. Reprocessing has now stopped in the UK and we are focusing on dealing with high hazards on site.

For many years we were not even sure what the technical solution would be—for instance, the Magnox swarf storage—but now it is under way; we are retrieving material from that every week. It will still take some time to do it all, but we are getting on with it.

Q457 **Chair:** We were the first civil nuclear nation in the world. We built the first reactor at Calder Hall and, therefore, we were the first country to decommission; we are ahead of the pack in decommissioning. Lots of countries have civil nuclear, so, if not in fuel reprocessing, in expertise, skills and experience in decommissioning we have a first-mover advantage, if I might put it that way. Does the NDA have plans to leverage that as more nations around the world come to the point at which their nuclear power stations need to be decommissioned?

David Peattie: We do. You are right to point out the fantastic history in the UK both at Calder Hall and Sellafield but also at Harwell, where perhaps it all began in 1946. Fourteen different types of experimental reactor were built at Harwell and we have decommissioned 12 of them, although we still have a couple to go.

You are right that the experience we have had from that is being drawn upon. Following the tsunami at Fukushima over 10 years ago, it was the UK to which Japan turned for the best technical advice on things like long-arm robotics to get into the melted core.

As for Canada and the US, we have just resigned our trilateral agreement for the sharing of information. We heard from Simon Bowen earlier about how collaborative the UK nuclear sector is. It is also incredibly collaborative internationally, working particularly with colleagues in the US and Canada and across Europe. We have an MOU with France, for instance, and prior to the war in Ukraine we were supporting that country in its thinking, particularly around Chernobyl.

Q458 **Chair:** Is that a part of the business that strategically it is your intention to expand? Lots of British firms do a lot of operational work in other countries for the private sector or public sector there. This seems to me to be something we could be doing. Are you set up to be able to maximise the potential?

David Peattie: I think we are set up. The organisation I have put in place since I joined a few years ago is much simpler and is streamlined. I brought the oversight of all our sites in-house rather than being run by private sector consortia. That allows us to be much more flexible. We can now invite foreign Governments to our sites more easily and we can share things more easily.

I emphasise that 99% of our 17,000 workforce are focused on the day-to-day clean-up, so the number of people and senior folk involved in expansion and the development of export opportunities for the UK is very small, but you are correct that this is an opportunity for us. The world does look to the UK for its expertise.

Q459 **Chair:** But if all those people are focused on the clean-up in the UK, as you put it, can you take advantage of this opportunity? If the Department for International Trade was looking for expanding markets globally in which the UK had a head start it might think of nuclear decommissioning. Stephen Metcalfe has asked some questions about skills. We know from our other evidence sessions that it is not easy to get nuclear skills. If they are fully deployed domestically, will we forgo that opportunity?

David Peattie: I do not think we are, because our shop window of skills and capabilities is the sites where these fantastic teams are working. Inviting foreign Governments and bodies to see what we do is the best marketing tool for the great skills that we have in decommissioning.

I know that from time to time, as we do with our very small international team, we can deploy to Fukushima and Canada to help educate and indeed support. Although it is small, it is a growth opportunity for us.

Q460 **Chair:** Since we left the European Union the status of our membership of Euratom has come into question. Does that have any implications for the NDA?

David Peattie: It does. The UK is now not a member of Euratom; we came out as part of Brexit. We are, however, a member of the IAEA, the international body that sits above Euratom. Because of our direct contact

there and by virtue of being a P5 member of the UN Security Council, that gives us a bit of extra clout.

What it means is that, having left Euratom, the safeguarding of material and the inventory of that now rests with the ONR. We had to transfer some of the monitoring equipment, cameras and some people, at the point of Brexit, but it all went smoothly. As we have heard, the ONR has had to beef up its capability a little bit to take on that extra safeguarding capability.

Q461 **Chair:** Discussions are continuing on whether we might have an association, as with Horizon, with Euratom. Is that important and desirable, or is it of lesser importance?

David Peattie: I think it would be a helpful step.

Q462 **Chair:** Why? What would it do?

David Peattie: It would continue to allow us to engage more closely with our European neighbours, particularly France, whose recent nuclear history has been much stronger than the UK's, and it brings us a little bit closer together where we can feel part of that important community rather than an outsider. If there is some form of associate membership I would welcome that.

Q463 **Chair:** As head of the NDA, have you been involved in discussions around a kind of plan B, if I can put it that way?

David Peattie: I have not, but I would be happy to get involved in that if asked.

Chair: Unless there are any other questions from members, that completes our questions to you, Mr Peattie. Thank you very much indeed for coming in person. You have a very important role. You manage one of the biggest budgets in the public sector and, even more importantly, you are responsible for a great deal of public safety, so your role is very much appreciated. Thank you very much indeed.

Examination of witnesses

Witnesses: Graham Stuart and Declan Burke.

Q464 **Chair:** Graham Stuart is Minister of State in the Department for Business, Energy and Industrial Strategy, with particular responsibility for energy. He is joined at the table by Declan Burke, who is the director in the Department for nuclear projects and development. Thank you very much indeed to both of you for coming today and helping us to round up our inquiry.

My colleagues will have some questions, but perhaps I can kick off with a theme of our inquiry. In our first session this morning we talked about Great British Nuclear. What is the current status of Great British Nuclear?

Graham Stuart: Thank you very much for inviting Declan and me today to this Conservative Science and Technology Committee meeting. I am sorry—I just noticed that there were only Conservative members on the Committee today.

Q465 **Chair:** We did have Committee members from other parties here earlier.

Graham Stuart: I am delighted to be with you.

BEIS announced that we will scope and set up this new flagship body, Great British Nuclear, to enable the delivery of nuclear projects. I know that you personally have more knowledge of this than most, but it follows the previous approach we tried that did not lead to the developments we were seeking.

We are looking to de-risk projects going forward with the setting up of GBN, changing the financing model, about which doubtless you will be quizzing me today, lowering the cost and delivering. GBN will be tasked with helping projects through every stage of the development process and developing a resilient pipeline of new-build projects.

Q466 **Chair:** You say it "will be".

Graham Stuart: I am coming to that. We will make an announcement on the set-up of GBN early this year and will back it with funding to support projects to get investment ready through the construction phase, while recognising the challenging fiscal environment outlined by the Chancellor in the autumn statement, which I think gives you all the clues you need—the breadcrumbs—on the issues.

There will be funding announcements, and until we have resolved and finalised agreement with His Majesty's Treasury I am unable to give you a date today, but you will be well familiar with those issues.

Q467 **Chair:** I am all too familiar with tussles with the Treasury. GBN will happen. It is a question of what its budget is going to be. Is that fair?

Graham Stuart: We are keen to see it launched as soon as possible, but it is about thrashing out and agreeing the details across Government and when we have landed. That is why I cannot make an announcement until we have landed and have got the agreement. I hope and expect it to be soon, because we have lot of ambitions.

GBN is a fundamental part of creating this new nuclear landscape. In parallel with it, if you like, or partly following from it, will be other decisions that will move at speed to transform what has been rather a stop-start—probably a generous description—nuclear policy over previous decades.

Q468 **Chair:** More stop than start. We know that there was a sprint over the summer to do the thinking behind GBN. It consulted widely and there was a report with recommendations. Why was that report not published so that there could be public consensus, in so far as that is possible, and

people understood the proposal, rather than just have a fait accompli announcement?

Graham Stuart: That is a good question. We are considering it carefully and looking to get agreement across Government and then come forward. Any self-respecting Select Committee Chair would always ask for more information out there. There is a balance to be struck. I would prefer things to be in the public space if it makes good policy sense for it to be there.

Q469 **Tracey Crouch:** In order to continue the theme of GBN I want to flip my questions around slightly. You say you are going to make a statement. Will it be on a White Paper? What form will the statement take? Will it set out precisely the role that GBN will play in delivering Government aims? Will it set out what kind of authority and autonomy it will have?

Graham Stuart: I would hope to come forward with the precise form, and that announcement will follow the decision made across Government, but I would expect to lay out as much as we can so that GBN can get going with funding in place and move at speed to be established and play a critical role in rolling the pitch, reducing risk and making investment in nuclear more attractive going forward.

Q470 **Tracey Crouch:** Will it have the authority and autonomy to deliver Government aims?

Graham Stuart: That is very much the aim. It will be a Government creature, but it will be set up to be able independently to get on with fulfilling the brief it is given. That is the classic balance we want it to be. It will work closely with my Department and follow a brief set by it, but we want good, senior people in a dedicated organisation to work on the challenge they have been set and feed back to us, but the aim is to make sure that it is as free to deliver the brief as it can be.

Q471 **Tracey Crouch:** We took quite a lot of evidence in the course of this inquiry that raised concerns about how Government will plug the energy gap, given the fact that the nuclear fleet is due to be shut down by 2028. What steps are you taking to ensure that the aims of providing 24 GW of nuclear power by 2050 are met?

Graham Stuart: That is an excellent question. The 24 GW is stretching; it is ambitious, and we are going from a more stop than start position, as the Chair put it. I think GBN is a really important part of that. We look back on what happened with GE-Hitachi and Wylfa, and learn lessons from that, getting the balance right between using the private sector and private finance and yet recognising the role of the state. GBN will be an important part of what hopefully will be a sophisticated and effective way of speeding up take-up.

We have gigawatt-scale nuclear, and we are pleased with the decision on Sizewell and the £700 million investment there following on from Hinkley. As you will be aware, we gave £210 million to help to develop Rolls-

Royce's technology. I hope soon to be able to announce that we will be doing a downselection of SMR technologies, ideally by the end of this year.

Q472 **Tracey Crouch:** Do you lie awake at night worrying about the energy gap?

Graham Stuart: This job is an extraordinary one at this time, is it not? There is a vast deployment of nuclear: SMR, potentially AMR development, gigawatts scale, offshore and onshore wind, floating wind, fixed bed hydrogen and carbon capture. It is a fascinating set of technologies. One tries to be as technology neutral as one can to keep competition and cost in mind.

The answer to that is probably a bit of a yes. We have deployment and the grid, interestingly, which you have looked at. As Chris Skidmore rightly said at the launch of his review the other day, grid, grid, grid. Having come in, despite all the challenges around the vast deployment that we need to do, with the regulatory and sometimes financial commitments that are needed from Government, we need National Grid. I heard the speech of the National Grid president in which she said we needed six times the investment in the next seven years in grid that we have had in the past 30. When you think about finance, deployment, logistics, the impact on communities and the political challenges around that, that is there as well. It is a big piece of work, but we all came into politics to deal with the big challenges.

You are very generous in allowing me to rant a little bit. We have this remarkable position on renewables. We have deployed that. Notwithstanding our stop and start approach on nuclear, we have brilliant nuclear scientists and capability in this country. We harness that and get going.

Alongside Norway, we have 80% of carbon storage in Europe. We have the hydrogen potential, without which you cannot decarbonise industry on current technologies, and then we have nuclear.

With that whole piece we have a chance in the 2030s to have the first truly clean energy and industrial base in Europe and, as others are following our pathway, we hope to be the most competitive and lowest cost, at which point we are not only doing our bit for the environment; we have the potential to give a competitive edge to UK industry and make us a more investable place. With our fortunate geography, we will see the north, north-west and north-east of England, Scotland and Wales having the real potential for reindustrialisation, and UK leadership economically.

All that comes out of admittedly extraordinarily challenging processes. We have to sprint faster than we have ever gone before and, at the same time, have a more co-ordinated, coherent and joined-up understanding. We cannot stop and wait for two years to think about it; we have to move

at pace and make sure that on things like grid we have a holistic network designed to try to join up, minimise impacts on people and realise savings where we can, but balance all of this out.

It is absolutely fascinating. The UK is at the cutting edge of it. We have led the world in cutting emissions so far and have the potential to maintain that leadership, develop the industrial capability and might that comes from it and contribute to the world's solutions. If SMRs produced in the UK can be part of that, would that not be fantastic?

Q473 **Tracey Crouch:** I am grateful to you for replying yes to my question about lying awake at night worrying. Do you think the Treasury understands the challenges and consequences that those challenges might bring if you do not overcome them? Does the Treasury lie awake worrying about it?

Graham Stuart: As Ministers, sometimes it is hard for us. I know that you have been in that position. We have to remember that we are like the Borg; we have but a single thought running through all our collective heads. One always has to remember that one is part of one. I think that the ministerial code practically mandates such an attitude.

Each of us has his or her own brief. I think the Chancellor and Treasury are absolutely alive to this and recognise the net zero challenge, which is a legal obligation apart from anything else, and that we have to put in place funding and make sure we maintain the leadership we have in certain technologies.

Q474 **Chair:** Is 24 GW by 2050 still Government policy?

Graham Stuart: Yes.

Q475 **Chair:** And one new reactor a year?

Graham Stuart: Government policy is to seek up to 24 GW by 2050.

Q476 **Chair:** It could be 3 GW.

Graham Stuart: From a strict point of view, yes. That is our ambition. The aim with GBN and the announcements we are going to make is that it can be up to 25%.

The last thing I want to do is send out a negative message around nuclear. The Government are absolutely enthusiastic about nuclear. We have just talked about the vast array of technologies. I would love it if storage to deal with the intermittent renewables became cheaper, more effective and better for long-term storage and the like. I am not saying that we will definitely have 25% of our electricity from nuclear. That is our ambition; that is our thinking; but as technology, prices and the economics develop, we want tensions between these technologies to deliver it. However, what I can say is that we are absolutely committed to nuclear as a significant share of our electricity because we need that baseload and are committed to driving it forward.

Q477 **Chair:** But you need a plan to turn an aspiration into a reality, do you not? When the announcement is made on Great British Nuclear will it set out a plan, which is to say specific commitments that will deliver the specific contribution of nuclear to energy generation?

Graham Stuart: I will not prejudge exactly what it will say. The energy security strategy set out that we would take one project to final investment decision in this Parliament and two in the next. Therefore, we have a plan that far out, but given the nature of nuclear, even if it was not particularly nascent in the UK, there would always be very serious impacts on the fiscal position.

We cannot give hard and fast commitments ahead of commitments from Treasury, which quite rightly looks after the public finances. We will see. We have that ambition; it remains the Government's ambition. We are setting up Great British Nuclear and hopefully will make an announcement soon, as we said we would, and we will look to move on SMRs and have a downselection this year.

Q478 **Aaron Bell:** I want to follow up the question asked by the Chair in an earlier session. It sounds as if we are getting an announcement soon, thanks to your discreet hints. From what Simon Bowen told us in the first session, this will require primary legislation. Will the announcement come with the promise of a Bill and, if so, when can we expect a Bill to be introduced?

Graham Stuart: If legislation is required we will come forward with details in due course. One of the challenges is to get necessary legislation on the vast array of things we are doing within the legislative framework. I do not know whether Declan wants to comment on that.

Declan Burke: We are working with Simon and the team around the exact form that GBN will take and what it will mean in terms of legislative requirements. If it did require legislation, we could still get on with it in shadow form, so you could make a start without having it in place; you could have things running in parallel where legislation required.

Q479 **Aaron Bell:** If it does require legislation, presumably that will be in the next Session rather than now.

Declan Burke: We would have to work with Ministers and the House authorities in scheduling when it would come in, but the key thing is that we could get on with it straight away in shadow form.

Q480 **Chair:** On that point, is it not the case that you need the Bill to pass Second Reading to be able to proceed with the shadow arrangements?

Declan Burke: We are looking at what arrangements and capabilities we have within the Department already and the functions you would need it to be carrying out. There are some early enabling works you might want GBN to be getting ready to advise on—building its capability, whether it is running a process around what technology we should be building,

whether it is doing things like site selections—before it comes to actual decision making. That is the sort of balance we are looking at.

Q481 **Chair:** It sounds as though you are giving a broad hint that we will not have legislation passed in this Parliament.

Declan Burke: We will be working it through with the ministerial team around the availability of slots at some point.

Graham Stuart: There have often been shadow organisations. The longer the gap between their establishment and the enactment of legislation the greater the question mark around that. You want them to be as close together as possible, so there is history. I know that when I was at DIT we had authorities set up well before we had the legislation in place, but I have not had advice on that.

Chair: I thought that Parliament had to give in-principle approval of the arrangements before you start setting up bodies; in other words, it has to pass Second Reading. I think that Tracey is indicating that that is her recollection. Perhaps we might have an exchange of correspondence on that so we can clarify it.

Q482 **Chris Clarkson:** I want to turn to advanced nuclear technologies, especially given your earlier message to the Treasury that resistance is futile.

You mentioned that £210 million had already been allocated to Rolls-Royce's SMR. Do the Government intend to enter into further negotiations to make that downselection, as you have called it, in due course?

Graham Stuart: If we set up a downselection there will be a process and it will be open to companies, including Rolls-Royce, to come into that, and then decisions would have to be made—they have not been made yet—about what you are downselecting to: the framework, the criteria and the rest of it. We are working on that with the aim of being able to do that rapidly.

If we complete the downselection this year, that is the beginning, given the nascency of these technologies, of a process of support, engagement and partnership with companies that have been downselected to get them to market with a product. In Rolls-Royce's case, hopefully it can be deployed in the UK in the early 2030s.

Q483 **Chris Clarkson:** The Government are looking at other SMR technologies as well as Rolls-Royce.

Graham Stuart: Yes, for the record.

Q484 **Chris Clarkson:** Other countries are looking at SMR technology and Rolls-Royce is very much in the mix. What is stopping a lot of those contracts being signed is the fact that the UK Government have not committed to it yet. Do you foresee any possibility of a lost opportunity

for the British nuclear industry if we do not make a commitment one way or another in relatively short order, given it will probably take at least three years to deploy the first one of these?

Graham Stuart: I think you are right, Mr Clarkson, about the need for speed. Following the Ukraine war and the fallout, the whole world is pushing on the same thing at the same time and there are real opportunities out there for us. That is one of the reasons we want to make a very early announcement on GBN, as we promised we would, and we want to do a downselection, which will send out a signal.

We want to design the system; we have to balance the different interests, maintain competitive tension and interrogate technologies to ensure that when we are partnering and committing we are taking a risk around that technology, but, as you say, we have to make those decisions. We have already given £210 million to Rolls-Royce. That expresses a pretty high level of confidence in it, but I think a downselection by the end of this year will send an even stronger signal to whichever companies we are working with at that point.

Q485 **Chris Clarkson:** Will the advanced modular reactor research, development and demonstration programme continue to pursue only the high-temperature gas reactor technology in the UK, or will it explore other technology options?

Graham Stuart: I believe it is open more broadly, but Declan may be able to assist.

Declan Burke: I think there is a bit of a focus on high-temperature gas reactors given the UK's capability and history around advanced gas reactors. The primary focus at the moment is more around HTGRs in terms of technology choices, but we speak to lots of different technology providers in the market about other technology solutions. There is an open dialogue with other technology providers, but there is a particular focus given our historic capability on the gas side.

Q486 **Chris Clarkson:** Is it more a comfort zone?

Declan Burke: I suppose it is building on our capabilities in the UK and the strengths we already have.

Q487 **Chris Clarkson:** What further support will this programme be given to ensure that advanced modular reactor technologies can support the Government's 24 GW commitment?

Declan Burke: There is probably a spectrum of gigawatt, SMRs and AMRs, although it is probably not as cleanly defined as that. In all the things that we are setting up in terms of enabling—whether it is through GBN or some of the barriers to the market such as how we help people to get through licensing, DEVEX or siting—all the work that will be done on SMRs or gigawatt will help to pave the way for AMR designs when they are ready. That work will add to it and the R&D funding will help them

mature the reactor design so that they can go into that more operational development phase.

The other thing that will be very interesting with some of those designs is the wider, beyond power,

applications, given the high temperature heat, whether that is industrial heat or hydrogen, for example. That will be part of the thinking as well.

Graham Stuart: Pink hydrogen, I think it is called. We have all these different colours.

Q488 **Chris Clarkson:** I call it watermelon hydrogen because you are using green energy to make pink energy.

Graham Stuart: Last month we announced another £55 million for that research and development project, with the aim of having an AMR demonstrator in the early 2030s.

Q489 **Chair:** Mr Burke, what do you consider to be the mix in the 24 GW between gigawatt-scale nuclear and SMRs, and ultimately AMRs?

Declan Burke: I do not think we have a defined mix in mind, apart from saying that if you look at the nuclear programme one of the key things this work is doing is to try to establish a programme where you have the supply chain capabilities supporting the industry. Hinkley started the nuclear programme in the UK; Sizewell provided some sort of continuity—so industry can show it can replicate—and making sure we are maturing SMR designs. They are going through the design and approval stage at the moment so that they are ready to construct, but a lot of the time we are using the same supply chain. It is really important that we are investing and keeping the supply chain busy through the gigawatt deployment, for example.

We do not have a defined mix in mind within government about what that split looks like.

Q490 **Chair:** Will you ever have one?

Declan Burke: I think it is a question to work through with Ministers whether we should or whether it should be best of breed or best technologies that come forward. The Government have talked about bringing forward SMR deployment, for sure. We think there is a lot of attraction. People talk about modular design, bringing down costs and so forth. It is a bit like offshore wind. We will have gigawatt deployment and SMR deployment in the UK, and then we will have a track record of deploying and seeing who is driving down the costs the best.

Q491 **Chair:** With at least four gigawatt-scale reactors, you need to have a view as to how many you will have; otherwise, you cannot possibly have them or keep the options open. I do not know whether you heard the earlier evidence which suggested we should have two gigawatt-scale reactors in addition to Hinkley and Sizewell. Does that ring true to you as

to what would be desirable?

Declan Burke: No final decisions have been made at this stage. As you say, the key on gigawatt scale is the lead time enablers. Whatever technology you are looking at, as we found out with GE-Hitachi, you are thinking about things like siting, experience of deploying in-country and all of those sorts of things. There are definitely credible candidates who could deploy in the UK.

Q492 **Chair:** But is that not why you need to have a commitment? There are lots of variables on siting, operator and all the rest of it, so you cannot proceed to those very difficult and sometimes intractable decisions if you simply do not know whether the Government are interested in financing gigawatt-scale nuclear power beyond Sizewell.

Declan Burke: With the gigawatt-scale programme, we now have Hinkley under construction and Sizewell going through the development stage, so there is a kind of established gigawatt for the supply chain pipeline. A particular focus is getting the SMR pipeline up and running, which the Minister has talked about, and I think that the mix between the two will need further work with GBN colleagues on what the supply chain is capable of and deployment in the UK, for example. They will need different levels of support from GBN, probably, in terms of financing commitments and so forth.

Q493 **Chair:** Minister, is it not the case that your excellent officials, with whom I worked when in office, give a very professional summary of that, but it is not really about GBN's decision? It is about the Treasury. Given the current state of things, the Treasury will not commit beyond Sizewell when, in getting value for money out of new nuclear, the returns come when you have repeated nuclear reactors. Is that not the frustration? It is not really about GBN, which has not even been established yet?

Graham Stuart: We all operate within financial constraints and the truth is that I am delighted about Sizewell. With Hinkley we are replicating it. In the past there was a sense that every time you built one you decided that there were improvements you could make, so you ended up doing a slightly different model with the next one and the next one. You learn the lesson that replication pays off. We will see whether that happens, because an awful lot of nuclear power stations all over Europe seem to be behind schedule and over budget.

It is a high-risk, very challenging game. It is a major piece of infrastructure in one place, is it not? We are hoping to benefit from the lessons that have been learnt, whether it is in Finland, France or anywhere else, and carry that into Hinkley and replicate it in Sizewell.

It is a very big financial commitment and the Treasury will play a role. I am not going to sit here and suggest that it is killing it off at any time with any Government in any situation. Signing off on nuclear power stations at gigawatt scale is a big decision. If you look back at the 1997 announcement the incoming Labour Government did not see a role for it

and all the rest of it. The Government and the Treasury have done not one but two. This is a sea change.

You can always make the perfect the enemy of the good, but I think we can be proud, within the fiscal constraints we have, of the vision that this Chancellor and others in government have shown in looking ahead and putting this in place. There will be an industrial base, a supply chain and renewed confidence in the nuclear industry which can be built upon in future decisions.

Q494 **Chair:** Your ambition is high and, not unfairly, you described the history of nuclear as being stop-start. Is there not a danger that we do Sizewell and then stop again? As you said yourself, the opportunity is to be in start mode and to commit to the sector and all the skills that come out of it—to say, this is going to continue; it is not going to end with Sizewell.

Graham Stuart: I very much hope that it will not end with Sizewell and that we get that replication benefit: doing it once will offer a certain benefit; there could be more still on the third and fourth occasions. I share your regret that it is above my pay grade to make these decisions, but I accept that that is the way it is.

Q495 **Stephen Metcalfe:** In answering one of Tracey's questions it was obvious that you have a passion and enthusiasm for getting this delivered, and you have some leadership and vision. That is fabulous, but to actually turn that into reality we will need to improve our skills base—certainly if we are going to do it at scale. I said earlier that we had the capability but not necessarily the capacity.

What can we do, particularly given that there are other large infrastructure projects on the books, to increase that skill base across the whole picture and ensure that nuclear gets its fair share of all those civil engineers, nuclear engineers, etc., to be able to deliver on an ambitious programme?

Graham Stuart: That is absolutely the right question. Clearly, the whole labour market is stretched. The No. 1 complaint from businesses is getting the people they need to deliver their business. I co-chair the Green Jobs Delivery Group, which followed on from the task force. I have touched on the transformation that is required in grid: you need a shedload of engineers, technicians and capable people in place.

The Government continue to work with the Nuclear Skills Strategy Group, as the employer-led nuclear industry skills lead, to ensure that we have an appropriate supply of qualified people to support these demands and attract and retain individuals from a range of different backgrounds and sectors. That includes subject matter experts to support new capabilities that will be required to strengthen the skills.

As part of the work of the proposed expansion of nuclear in the UK and the establishment of GBN, the Government are considering how best to push that further, because whatever we do across this piece, we will need

people to do it, and we need to make sure that they are attracted in and see it as having a good future and offering a good life for them.

Q496 **Stephen Metcalfe:** Absolutely, and attracting people is the key, because you need to be getting to them early. In 2018, we had the Year of Engineering, which was under the Department for Transport. It was a success at the time but has probably petered out now in its ambition and scope.

As Government Departments, do we need to continue banging the drum for engineering for these kinds of jobs, to teachers, influencers and parents, right down into primary schools, to make sure that people understand what the roles of tomorrow are and not the roles of yesterday?

Graham Stuart: I agree with you. I know that you have taken a passionate interest in this over many years. That is why the Prime Minister talked about having maths studied to the age of 18. Maths is at the heart of a base on which you can build the technical skills to be able to do a variety of these jobs.

The Nuclear Industry Association notes that our civil nuclear industry currently employs about 64,500 people and over 1,700 apprentices. Hinkley Point hit its goal of training 1,000 apprentices last October. The updated "Nuclear Skills Strategic Plan", published in December 2020 by the Nuclear Skills Strategy Group, aims to ensure that employers can recruit the highly skilled workforce they need.

But you are right: we need to bang the drum. That is why we need people studying maths and why we are trying to make sure that we reach out to and convey the opportunities in a way that attracts everyone in the population—from ethnic minorities and women to any other under-represented groups.

We need the whole of UK talent, and we need them prepared from the early years onwards all the way to 18 and beyond with the skills they need for what are great jobs. Nuclear is a well-paid industry, and, thanks to this Government and the Chancellor's vision and support, it has a pretty positive future, but we need to get that story out there. We are constantly looking at ways to do that and we welcome the Committee's interest.

Q497 **Stephen Metcalfe:** Brilliant, thank you. The other two small parts of that question have been answered in response to the Chair, so I will ask a question about the Government's support for developing a domestic nuclear fuels capability, including reprocessing. Is that the intention? Do the Government intend to revisit their decision to close the Thermal Oxide Reprocessing Plant?

Graham Stuart: Thank you for that. The UK has, of course, many decades of experience of the nuclear fuel supply chain and a highly skilled workforce, which is currently concentrated at the Springfields and

Capenhurst sites, as the Committee will be aware. The Government have recognised these sites as strategic national assets.

The nuclear fuel fund, launched this month, aims to invest up to £75 million to support the UK's nuclear fuel supply chain to develop the capabilities needed to meet current and future fuel demand in the UK and globally. Of course, that is in the context of Russia's appalling invasion of Ukraine and our desire to reduce our and other people's dependence on Russian nuclear fuel supply.

The NFF—the nuclear fuel fund—will be used to preserve and strengthen UK fuel production capability in recognition of the value of a strong nuclear fuel supply chain, supporting our reactor deployment ambitions and protecting our energy security.

As part of your inquiry, you heard from Urenco, which is a hidden jewel. We hope to overcome barriers to investment in the UK's front-end fuel cycle supply chain by offering match funding to promising projects that support the establishment of new capabilities to produce or handle uranium and associated fuel products. As announced in the G7 leaders' communiqué in June, we want to be part of a diversification of global fuel supply away from Russia.

Q498 **Stephen Metcalfe:** That sounds good, but I am not sure I heard whether you will revisit the decision to close the Thermal Oxide Reprocessing Plant.

Graham Stuart: I will turn to Declan, who may be in a better position to answer that than me.

Declan Burke: Perhaps we can come back to you on that and answer the question in correspondence.

Graham Stuart: I will write to the Committee.

Q499 **Stephen Metcalfe:** But I am right in saying that it is currently the proposal to shut it.

Declan Burke: Perhaps we can come back in writing on that particular topic, if that is okay.

Stephen Metcalfe: Fine.

Q500 **Chris Clarkson:** Minister, I would like to turn to financing. Does the RAB model offer value for money for taxpayers, considering they will have to start paying for Sizewell C in their energy bills before it is even built?

Graham Stuart: That is an excellent question. Last March, the Nuclear Energy (Financing) Act 2022 received Royal Assent. As you rightly said, that established the regulated asset base model as an option to fund new nuclear projects. It is tried and tested on large-scale infrastructure projects, including the Thames Tideway Tunnel and Heathrow terminal 5.

Over the 60-year lifetime of a generic large-scale nuclear power station, using RAB could save consumers up to £30 billion compared with the contract for difference model. It achieves this by reducing the cost of finance, which is the biggest driver of nuclear project costs.

Offshore wind is capital up front and then a long return. I always remember the Crown Estate saying years ago, from a constituency interest, that a 1% increase in financing costs brings a 12%—I think, or 14%—increase in lifetime costs across the project. For nuclear it is even more. The cost of finance has a real impact.

The RAB model shares the risk, so I am absolutely convinced that it saves money. It shares the risk because consumers, through their bills, are contributing to it on an earlier basis, but that reduces the impact on developers and that co-investment reassures their lenders. That is where our £30 billion comes from, and I am confident that it saves money.

Q501 **Chris Clarkson:** Thank you for anticipating my next question. Would you be willing to publish the heads of terms for the financing model?

Declan Burke: As the Minister said, the key function of RAB is, first, to help us raise the capital needed to develop the gigawatt-scale nuclear power plant, adjusting, on the back of experience learned through Hitachi, for example, for the nature of a nuclear asset, a long build period and, as the NEA recommended when it was looking at Hinkley Point, more of a sharing of risk between the consumer and the project to drive down the costs of capital, because it is such a big driver.

At the moment we are in discussions and negotiations on the details of what that should look like, exactly calibrating that so that you maintain some incentives on investors in the project to drive down costs and deliver on time and on budget, and how that links with project costs and so forth.

As you can imagine, those are commercially sensitive discussions so that we can get the best deal possible for the consumer. At the point of a final investment decision, I am sure there will be an update and a publication on those elements, but ahead of that the plan is not to show details which would make it more difficult to achieve the best commercial deal.

Q502 **Chris Clarkson:** But, once it is finalised, in principle you would be happy to publish.

Declan Burke: At the point of a final investment decision.

Q503 **Chris Clarkson:** Nuclear generation was excluded from the 2021 green financing framework as many sustainable providers have a presumption against nuclear. What has changed for BEIS to be supporting its inclusion in its taxonomy now?

Declan Burke: At the time, the Treasury mentioned that it would keep the green gilt framework under review as things such as the taxonomy

and so forth evolve. The Government have said that they think there is a strong case for nuclear to be part of a green taxonomy, given its role in complementing renewables for a firm, resilient, low-carbon power mix.

The Treasury intends to update and come up with a consultation on the UK taxonomy. We think that nuclear should definitely be part of that for the reasons that I have mentioned. As we make our way through that UK taxonomy and what is in it, the Treasury has said that it will keep a constant review of the green gilt framework, based on things such as the taxonomy.

Q504 **Aaron Bell:** I will follow up on some of the other sessions we had earlier today. First, on regulation, Minister, how do we intend to address the capacity in the regulatory system so that we can achieve the aims of approving one new reactor every year?

Graham Stuart: I have not seen the feedback on the evidence you took from the regulator, but the fundamental framework, as I understand it, is one in which developers pay. That is quite a good framework to have. Rather than it being a fixed Treasury payment until you negotiate some more money, it is aligned with demand. Broadly, we are in the right place there.

As the demand and requirement grow, so does the resource, through fees, to generate the staff to be able to do the work. As I said, we are trying to move forward on that and in other areas in the next couple of years so that developers pay and we are not having to ask the Treasury to go over twice as many applications as we thought, with the critical path planning thing holding everything up. That is the system we want, generally, and we appear to have that in place already for nuclear.

Q505 **Aaron Bell:** That is a feedback loop that would work, but there has been some suggestion in some of the evidence we have taken that there is not enough capacity at the moment, given that we are at a point where we are trying to have some new designs approved.

Graham Stuart: That is right, and work is going on in order to increase that capacity. In such a highly specialised area you do not get people overnight; you cannot just get them off the street, give them a one-week course and get them doing this work. It is a challenge.

Declan Burke: We would want designs entering the regulatory approval process at the right time in their maturity. There are something like 80 designs globally for SMRs, so reaching credibility when they are ready to go through the regulatory scrutiny is important as well.

Q506 **Aaron Bell:** Does this current lack of capacity tend to promote a monopoly, a lack of diversity? Is that something you would want to change?

Declan Burke: We speak regularly to Mark, whom you saw earlier on, and his team, about what the forward plan looks like in terms of people

going through the process. Rolls-Royce is going through the process at the moment, and it has regulatory capacity to take additional people through that generic design approval process, so we think we can work with them to get enough people through their regulatory approvals, preserving some competition. We do not see it as leading to monopoly-type behaviour.

Q507 **Aaron Bell:** Minister, the overall strategic point is that we heard both cases: that replication is what drives the costs down, but at the same time you want some competition. Where do you see that balance being struck as we go forward?

Graham Stuart: It is another potential benefit of SMRs, because gigawatt- scale nuclear projects are so enormous that they can have a destabilising effect almost on national balance sheets and certainly on corporate ones. With SMRs, you will have a skills base and, in an ideal world, these factories will be continuously producing and you will get to a proper, fully occupied life cycle of early development, build, deployment and decommissioning which you do not get even in France, with their commitment to nuclear—they have a lumpy situation. One of the potential benefits of SMRs is that they are continually produced, and the more they make, the more they hopefully reduce cost and production generation challenges.

Q508 **Aaron Bell:** When do you, or the Department, intend to publish the updated national planning statement on energy? The current nuclear energy one, EN6, covers only reactors producing over 1 gigawatt, and energy up to 2025, so clearly it is in need of an update. Will we start including new sites in the update? There are only about six or seven nuclear site licences left and I do not think that will be sufficient capacity for our goals.

Graham Stuart: That is an excellent question. We will develop a new nuclear NPS which will cover the siting and policy framework for nuclear electricity generating infrastructure beyond 2025 and support the UK in meeting its ambition of having up to 24 gigawatts of nuclear energy by 2050.

The new NPS will take into account the significant changes in the nuclear landscape since EN6 was designated, which you quite rightly highlighted, and it will include the potential for small modular reactors and other advanced nuclear technologies. We will consult on this new NPS in due course and aim to designate the new NPS following parliamentary scrutiny.

On the time issue, we will make sure that it is in place and ahead of—

Q509 **Aaron Bell:** It is getting quite urgent, if we only have a policy that runs to 2025 and this is all about long-term planning.

Graham Stuart: Our working estimate for developing, consulting upon and designating a new nuclear NPS is three years, and in this time I will

ensure that a planning framework is in place for deployment of projects beyond the end of 2025. As part of work towards a new NPS, we are developing an overall siting strategy for the long term.

Q510 **Aaron Bell:** So that work is currently going on right now, within that three-year timeframe.

Graham Stuart: Yes.

Q511 **Aaron Bell:** Can we expect to hear something towards the end of this year, or are you not able to give a date?

Graham Stuart: I am unable to give a date today. On the issue of timing—

Q512 **Chair:** The Government have a vision for nuclear; they have said a lot about it. They want to establish confidence, with big announcements on Sizewell. If we cannot even know when they intend to publish the national planning statement for nuclear, that is going in the opposite direction and undermining confidence, is it not? It is not really good enough.

Graham Stuart: I completely reject that. We will have it in place well ahead of the need for it in 2026. We will go through that process—

Q513 **Chair:** The clue is in the word "planning". Planning is about the future. How can people contemplate investing here if the planning statement will be, as you just indicated, just in time?

Graham Stuart: I take your point. This year we will have the siting strategy, which is the critical element.

Q514 **Aaron Bell:** On nuclear decommissioning and waste, it seems there are very significant costs and extraordinarily long timescales involved in developing a geological disposal facility. Do you believe that the policy is fit for purpose, and why are we not considering permanent surface level disposal as an alternative?

Graham Stuart: Around 94% of the UK's radioactive waste is low in radioactivity and is disposed of safely every day in existing facilities. We currently store the remaining higher-activity waste safely and securely in facilities in the UK, but this is not a long-term option; the stores would have to be maintained and renewed for hundreds of thousands of years, at enormous cost. That is why we are committed to implementing geological disposal for the long-term safe and secure management of radioactive waste.

I would be interested in the Committee's insights. Obviously, I am relatively new to this role and this vast decommissioning balance sheet item and interesting area of responsibility. Everything in nuclear is unusual for those who are not used to it, including me when I came to it, and I agree that the timeframes seem extraordinarily long.

I know about international comparators, and some people are further along, but, again, it seems that this is a very long and complex job wherever it is done. We are doing it in a thorough way, and we need to make sure that, wherever we eventually settle on, the community there has been properly briefed.

If there are insights to suggest that there is something fundamentally wrong with this approach, I would be interested to hear them, but, as I said, from my limited look at what other countries are doing, it would appear that our approach is particularly rigorous and professional, as you might expect. If there is an alternative, I would be interested to hear it, but right now this looks to be the right way to go, albeit that the timeframes are extraordinary, as you said.

Aaron Bell: The policy has been in place since 2006, and we still seem to be quite a long way away from it. That might be something for our report. Thank you.

Q515 **Chair:** This is the final session, and it is traditional to have the Minister here. Our next communication will be our report, with some recommendations to the Government and other bodies. We have taken a wide range of evidence from this country and around the world. This is one of the most important matters on the Government's agenda, and the Committee has put a great deal of effort into helping the scrutiny but has also exposed some of the decisions that need to be made.

I hope, Minister, that when you receive our report, you will approach it with vigour and look not just to accept but to implement many of our no doubt very wise recommendations.

Graham Stuart: I very much look forward to receiving it. As a former Select Committee Chair myself, I always watch the pattern. I do not know whether this is a fair characterisation, but, typically, the report would come out, the Government would effectively diss it in some way and then six months later slowly start implementing it.

You have an opportunity that a Minister facing a blizzard of things does not have: to sit, reflect, hear from people nationally and internationally and make recommendations. You do not have to sell to me the ability of Select Committees to make those contributions and get the Government to think about them and respond, as they are obliged to. It is a really useful way of improving policymaking. I am delighted that you have put that work in, and I look forward to your report.

Chair: Thank you very much indeed. I am very grateful that, as a poacher turned gamekeeper, you can break out of the normal Government habits on these things.

Thank you very much indeed, Minister, and Declan Burke, for appearing, and to all our witnesses this morning, and indeed throughout the course of the inquiry.

HOUSE OF COMMONS