



Select Committee on Science and Technology

Corrected oral evidence: Priorities for Nuclear Research and Technologies

Tuesday 7 March 2017

11.45 am

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Members present: Earl of Selborne (The Chairman); Lord Borwick; Lord Broers; Lord Cameron of Dillington; Lord Fox; Lord Hennessy of Nympsfield; Lord Mair; Lord Maxton; Baroness Neville-Jones; Lord Oxburgh; Viscount Ridley; Lord Vallance of Tummel; Baroness Young of Old Scone.

Evidence Session No. 6

Heard in Public

Questions 50 - 59

Witnesses

Dame Sue Ion, Chair, Nuclear Innovation and Research Advisory Board; Lord Hutton of Furness, Chair, Nuclear Industry Association.

USE OF THE TRANSCRIPT

This is a corrected transcript of evidence taken in public and webcast on www.parliamentlive.tv.

Examination of witnesses

Dame Sue Ion and Lord Hutton of Furness.

Q50 The Chairman: We welcome back Dame Sue Ion, who has helped us many times in the past on our previous inquiries. We look on this very much as following up the last report—thank you. We also welcome to Lord Hutton, who we are delighted to have with us to help us. As we are all aware, there may well be a Division during this evidence session, in which case we will stop for 10 minutes or so, so that both Lord Hutton and members of this Committee can all do their duty, whatever it may be. For the record, because we are being broadcast, I invite first Dame Sue and then Lord Hutton to introduce themselves for the record. If you would like to make an introductory statement, please feel free to do so.

Dame Sue Ion: I am Sue Ion. I am the outgoing chair of NIRAB, the Nuclear Innovation and Research Advisory Board. I also happen to chair the European Commission's Euratom Science and Technology Committee, and I have just accepted a role as honorary president of the National Skills Academy for Nuclear.

Lord Hutton of Furness: I am chairman of the Nuclear Industry Association here in the United Kingdom. I also co-chair the Nuclear Industry Council and am leading the work on the new nuclear sector deal.

The Chairman: Thank you. If you are content, we will go straight on into the questions. As I say, we will probably be a bit short on time on this, not least because of the Division. Baroness Young, would you like to start?

Baroness Young of Old Scone: A number of the people who have given evidence so far feel that there is not a sufficiently clear long-term strategy that persists which would allow the rest of the nuclear industry and all the various partner bodies to get behind it and add what they have to add. I wanted to ask each of you where the backbone for the delivery of such a strategy might come from in the future, so it is the vision thing, as Prince Charles would put it. Is it the Nuclear Industry Council, is it an independent successor to NIRAB, or is it the glued-together partner input that the NNL were describing? Where do each of you see this drive to get a strategy coming from? It is clear that politicians do not hang around long enough to do that job.

Dame Sue Ion: What is required is something that successive Governments will support that is driven by both government and industry because of the long-term nature of the nuclear sector. The previous Administration, following your Lordships' last recommendations, had a Nuclear Industry Council and a nuclear industry strategy, which set out pretty much what you would expect to see in a long-term vision for the sector. The only problem was that it was aspirational and did not set out how or how much it would cost to deliver all the elements that were identified. Hopefully, the new Nuclear Industry Council, which I am sure Lord Hutton will say more about, will be a place to review that previous

iteration and, with government, determine a way forward which will make things happen.

So far as the lead departments are concerned, we have now the merged BEIS covering energy and industry, which is a good step forward because energy, industry and national security are all linked in one way, shape or form, so a departmental lead for any Government of the day in that form is really important. The Government need to set out their aims and objectives for nuclear over the long term because they shape pretty much everything that follows, whether it be the industrial strategy or any research that underpins it. You have to think long term because, when you compare nuclear technology with other low-carbon technologies, the benefits will only be returned in the longer timescale and a significant nuclear contribution will be needed if the UK's aims and objectives are to be fulfilled.

Lord Hutton of Furness: I agree with everything that Dame Sue has said. I think we have a vision in the 2013 nuclear industry strategy which is a good one. The Nuclear Industry Council, which was set up at the same time to help oversee the implementation of that strategy, struggled in the first couple of years to really make its mark. I think it was too big and it was not focused on the strategy, but became subsumed into a lot of operational-level detail, which really could and should have been done elsewhere. With the new council, we have a chance to press the reset button and get going again on this. The nuclear sector deal, which I am sure we will come on to, should help to reinvigorate that partnership.

When it comes to nuclear, I agree with what Dame Sue has said, that there have to be three people in this relationship: this Government, this industry and the research community. Every successful nuclear nation has found a way of forging an effective partnership between those three constituent elements. I do not think we have done that particularly well in recent years and we have an opportunity to do that more effectively going forward. That is certainly what I want to do in the new Nuclear Industry Council and, with the work on the nuclear sector deal, I think we have an opportunity to start that process.

You have to start with a vision. We have one that is certainly workable, but we have to keep it under review and make sure it is delivering the aspiration. I do not think aspiration is a bad thing. I do not think you can have vision without aspiration. We all have to ask ourselves the question of what sort of nuclear nation we want to be. Do we want to be a top-table nuclear nation, which is the role we have always occupied and done so brilliantly in the last 60 years, or are we going to settle for some other role which might not be the full-spectrum range of capabilities that we have got used to? I am certainly not prepared to give up on any of those areas of excellence and expertise where the UK has shone so brilliantly in the last 50 or 60 years, but that will require some pretty hefty policy decision-making and we need to get on with that pretty soon. Although it is long term, we have to make sure that investors and the private sector, who will take a lot of this forward, get the right signals at the right time so that they can start making the commitments they need to make as

well. I think there is a risk that if we do not press on with this pretty quickly we might lose a golden opportunity.

Q51 Baroness Neville-Jones: I would like to ask you about the sector deal that you have mentioned. From what you have said, Lord Hutton, it rather suggests to me that you see a possible range of options that such a deal might cover. What would you see as the optimal position that any deal might comprise and what would its benefits be, both for industry and the nation?

Lord Hutton of Furness: That is to be determined. To put it into, hopefully, a helpful context for the Committee, we met for the first time as the new Nuclear Industry Council only a fortnight or so ago and we had a pretty extensive discussion about what, for industry, we would like to see from the sector deal, and I think it is true to say that we want to set the bar pretty high. The Government have made it clear to us that there is no template, no box into which we have to squeeze everything, which I think is helpful. They have also made it clear that we can do this in stages. With what we need to get on with right now, today, to help the industry, we have a huge set of challenges right across the whole spectrum—new build, decommissioning, fuel cycle issues—so we will look at issues to do largely with skills and competitiveness in the first instalment of the nuclear sector deal because we recognise that these are massive challenges.

So far, we have got off to a reasonable start. We have brought together a group of people within the council to help fashion this. The Nuclear AMRC and the National Nuclear Laboratory will be involved and, I hope, the Nuclear Decommissioning Authority will too, so I think we have all the right people in the room engaged on trying to fashion this, but it is too early to say exactly what this deal will look like. Ministers want to get on with it, and we are happy with that; we think we should press on. I have talked about the need to be decisive and make decisions and get on with things, so we do not want to kick this can down the road at all. I hope that we will have something that we can talk about and air in public by the end of the summer.

Baroness Neville-Jones: You say, and it is fair enough, that you can do it in stages, but do you not need a vision of where you are going in order to decide what your stages need to be and will be?

Lord Hutton of Furness: We do. We have been assured, and we are pleased to have received this assurance, that the 2013 nuclear industry strategy remains the goal for which we are all striving, and the goals in that strategy are pretty ambitious. We now need to make the various decisions, and there are many pending, to start to move in that direction. The nuclear sector deal is not seeking to devise a new strategy for the sector because we have a perfectly workable one. We are now looking to operationalise, if you like, in a practical way what we can do now to help deliver that ambitious strategy that was set out in 2013, which the industry very strongly supports.

Baroness Neville-Jones: Do you think that perhaps you can add some

acceleration to the speed at which we have been moving, because it has been slow?

Lord Hutton of Furness: The council will certainly try to do that. We are industry led and it is absolutely not in the industry's long-term or even short-term interests to disappear for years into a room and emerge in due course, no. Every part of the industry faces challenges today and we need to crack on and try to find a way of responding and rising to those challenges, so we are absolutely not interested in pushing this into the long grass at all.

Lord Fox: BEIS has established industry sector deals with other industries. Which of those industries have you looked at? The Aerospace Growth Partnership is one model and the Automotive Council is another, which are two I know about. Have you looked across the BEIS sector spectrum, and which bits will you cherry-pick of those other deals for your sector?

Lord Hutton of Furness: I do not think we look at it as a cherry-picking exercise, to be honest. Of course, we will look at the other models.

Lord Fox: But there are good examples that you could cherry-pick.

Lord Hutton of Furness: Sure, and we will look across all those other examples and fashion something that is sensible for the nuclear industry, but we have literally only recently begun to do that work in the last week or so and I do not want to sit here and pre-empt any of that. There are plenty of good examples. Generally, the industry is very positive about the nuclear sector deal and we are very supportive of this initiative and think that the Government are doing the right thing.

Lord Maxton: In another incarnation, you were Secretary of State for Defence. The one issue that has not been raised, and, to some extent, it answers Lord Hennessy's problem, is the relationship between the nuclear power industry and the international proliferation of nuclear weapons. That has obviously always been in the minds of people and is one of the questions that is always raised about the SMRs—that selling them abroad is a proliferation issue in nuclear knowledge and materials. What is your answer to that question, because I think it is, to some extent, at the core of what we are trying to do?

Lord Hutton of Furness: It is a hugely important issue. The Ministry of Defence is represented on the Nuclear Industry Council, which is incredibly important. What we have found in the last few years, of course, is that the timetable for nuclear new build in the UK has all become very compacted together. So we have three major developments within close proximity to each other, coming at the same time as the Ministry of Defence and the Government are committing to the future nuclear ballistic missile programme as well. It is all hands to the pump in that sense because we have an awful lot to do in a much more compacted timescale, so we value the involvement of the MoD in helping us to plot that course.

On the proliferation issue, this is, in part, to do with our relationship with Euratom going forward. Our non-proliferation commitments are clear and

are intertwined with the Euratom Treaty obligations, so we must find a proper way to progress those as we leave the European Union. We cannot have a period when there is any gap. I know that there is a very fraught debate going on about the terms of our exit from the European Union, but, when it comes to the nuclear industry, and the trade in goods and services in nuclear, there really is not any opportunity to fall back on something else, unless we are absolutely sure that we have all the pillars in place on the nuclear safeguarding arrangement. Britain plays a strong role in proliferation. I am very strongly supporting that, and I hope the Government will continue to put their elbow behind that because it is in all our interests that we secure nuclear material around the world and make sure that it is not used inappropriately. The Government certainly have a job of work on their hands now, given that they are exiting Euratom, to make sure that this does not fall off the cliff either because that would be a very bad thing.

Lord Hennessy of Nympsfield: I think it is fair to say that the history of civil nuclear power in our country over 70 years is a mixture of triumph and tragedy. I do not think there are any iron laws of history and I think, as Mark Twain said, history does not repeat itself but sometimes it rhymes. What are the don'ts that you take from the history of our past, because we have had some pretty glittering cul-de-sacs that we have gone into before now? What is it about your efforts, and Dame Sue's, that gives this a chance of not being yet another false renaissance?

Dame Sue Ion: It depends on which perspective you are looking at it from. You have made a good point, Lord Hennessy. If you had asked me 10 or 15 years ago if I would advocate the deployment of three, possibly four, reactor designs going forward in the UK as their first-wave renaissance, then I would have looked at you incredulously. Having got to that position now, I would say that my view has changed significantly because, whereas in the past we set about developing new systems from scratch and did not standardise those at all in any way, shape or form, when you look at the systems that we deploy now, all of them are part of global nuclear fleets, with all the lessons that have been learnt along the journey of the vendors and the deployers in the other countries of deployment. We are, effectively, getting the benefit of being able to more speedily deploy three, possibly four, designs with the different supply chains that they bring with them to give us the security of energy supply that we need. I think it is a good thing that we have different designs, albeit from standardised fleets.

When it comes to the question of the SMR, again the benefits will only be realised if we deploy fleet deployment and get the maximum volume and maximum factory-build content of those systems. But perhaps we will discuss SMRs later.

Lord Hutton of Furness: I would agree with everything that Dame Sue has said. I am not sure I could improve on that.

The Chairman: Dame Sue, going back to the way that a possible sector deal might be formulated, does the structure of how it is formulated, as set out by Lord Hutton, make sense to you?

Dame Sue Ion: Yes, it does. I fully agree with Lord Hutton's explanation of the forward work of the Nuclear Industry Council. I have a position on that council, as does the National Nuclear Laboratory in the form of Professor Howarth, so I think that research and research needs are represented at the highest level on the council as this goes forward, and we will be working to ensure that any sector deal includes the mechanisms needed to commission and co-ordinate the research that is essential to underpin the direction that is set.

Q52 **Lord Mair:** On that point, Dame Sue, the whole question of co-ordination across the various bodies doing research for the nuclear industry, what is the best way of co-ordinating that? NIRAB, of course, has now been wound up, so what do you think should be its successor?

Dame Sue Ion: Given the complexities of the nuclear landscape and the particular issues that it brings with respect to safety and security safeguards as well as the content of any research programme, it is important that there is a body that is able to scrutinise the whole of that landscape. NIRAB's role, as a committee, was to oversee that landscape and what it looked like. In terms of bringing together the co-ordination, that was executed by the hard work done by NIRO—the Nuclear Innovation and Research Office—which was the secretariat that supported NIRAB. For the first time in probably a decade, we were able to look at all publicly funded research and development and, so far as we were able, much of the private sector's ongoing investment in the current landscape. It is important to have that because otherwise you stand a chance of duplicating—which is bad, because it wastes public money that could otherwise be diverted to filling the gaps, which is probably more important. You need some body which brings together all aspects of the publicly funded research so that you can see what is being spent, not necessarily to direct it but at least to share information. One of the benefits of the work that NIRO did with NIRAB was that everybody knew what was going on, so it was possible for the research councils, in their managed calls, to call for work to plug the gaps that were then known about and it was possible for the Nuclear Decommissioning Authority to understand what was happening elsewhere in the landscape so that it did not inadvertently duplicate what was necessary.

Lord Mair: The "some body" that you refer to, who should that body be?

Dame Sue Ion: The Government need to put something in place that will oversee the totality going forward. They have a high-level body, the Energy Innovation Board, which in theory should co-ordinate public funders of all energy research, not just nuclear. But, frankly, it would not do justice to the nuclear part of it because it would not have sufficient time to give it the scrutiny that is necessary. There are any one of a number of ways that that co-ordination could be provided, Lord Mair, but it could possibly be given to the National Nuclear Laboratory as part of its role going forward. There is no reason, since it is a publicly owned body, why it could not fulfil that role if asked to by the Government.

Q53 **Lord Oxburgh:** I have a few more-detailed questions. First, has NIRO

expired along with NIRAB, or does it still exist?

Dame Sue Ion: NIRO still exists at the moment. NIRO is a perfectly formed, very efficient body of four individuals who have done an absolutely stunning job over the last three years. It is made up of two secondees from the National Nuclear Lab and two secondees, as it happens, from the private sector, although the positions were open to academics and private sector personnel. In order to do the job that is required going forward, you would probably want a slightly bigger NIRO that has the flexibility, as was said in the previous evidence session, to bring people in and out, to keep them refreshed and to have the expertise according to the need.

Lord Oxburgh: Maybe I read this wrongly into what you said, but NIRO had a budget to help fill the holes in the existing pattern of research programmes. Is that correct?

Dame Sue Ion: No, neither NIRAB nor NIRO had any money whatsoever to dispense out into the wider world. NIRO was funded by what was then DECC, now BEIS, in terms of the salaries of the personnel who sat within it and that is all. We had no executive authority to dispense funds. All we had was the requirement to provide advice on what should be funded to plug the gaps.

Lord Oxburgh: To whom did that advice go?

Dame Sue Ion: It went to the Ministers of State at the time.

Lord Oxburgh: So the hope was that they would follow this advice and put money in various places to achieve what you had in mind?

Dame Sue Ion: That is true and, over the three years of NIRAB's work, after each year, we issued an annual report that specified where the gaps were and where the essential funding needs were, and we sat back in hope and aspiration. To be fair to the Government, a number of investments were made mainly in capital infrastructure, which was extremely welcome, but throughout our existence we have urged Governments to fund work in those capital assets, so programmatic work which enables the funding of scientists and engineers to do the work that is required. So far, the only funds of that type that have been committed of the £250 million that was promised in the CSR have been £20 million, which is currently out for competition. It is a good start, but, three years down the road, we need to see the commitments fulfilled of the money that was sought.

Lord Oxburgh: Now on the NIC, to whom does the NIC report? Is it the Secretary of State?

Lord Hutton of Furness: It does directly report to the Secretary of State, yes.

Lord Oxburgh: Does he or she have an obligation to respond to the council?

Lord Hutton of Furness: It is not a statutory obligation, but it is an effective obligation.

Lord Oxburgh: It is an expectation?

Lord Hutton of Furness: Yes.

Lord Oxburgh: How are the individuals chosen to represent the industry? Are they truly representative of the industry from the industry's point of view, or is it a series of people perhaps chosen by the Government, or something like that, whom they would like to have represent the industry?

Lord Hutton of Furness: I think the process of selecting members of the Nuclear Industry Council was a collaborative one; the Government did consult the Nuclear Industry Association about the membership of the council. I do not think there was a public advertisement process.

Lord Oxburgh: But, essentially, it is a government decision?

Lord Hutton of Furness: Appointments to these sorts of bodies are always government decisions, but it was collaborative.

Q54 **Lord Broers:** This question has largely been asked, so I will ask another. The original question was, "Was NIRAB a success? What body would be best-placed to continue this government advisory role, and what relationship should any successor body have with the NIC?" I think we have talked a lot about that, but there is maybe more. Dame Sue, are you confident that your final report will be carefully read and that what it recommends will be taken up by government?

Another question I would ask is a rather sceptical one. I read your report quickly and looked at a lot of the tables. We keep saying that we are a world force in nuclear and all the rest of it, but, when you look at our spend compared to other nations, it is pretty derisorily small, particularly compared to France, Japan or the United States. Is it the old British thing that we are so much cleverer and we can do it in the garage, or are we not really internationally competitive?

Dame Sue Ion: I will answer that in two parts, if I may, Lord Broers. I will develop first the question about NIRAB's success and then come back to the question you have asked. I guess I am the wrong person to ask about NIRAB's success really; you ought to ask the membership and the Department of State that it served. The one benefit that it had was that it had representatives right across the sector—from uranium conversion to enrichment, to fuel manufacture, to reactor operations, reprocessing, waste management and decommissioning and fusion—from industry at the highest level and by matching very senior academic expertise. Basically, the Government got the best advice they could get and they got it for free. NIRO performed the two roles of advice and co-ordination. For a body giving advice going forward, the important thing is that it should be independent, that it should have the right calibre of expertise and that there should be a clear idea from government as to what that relationship is. Is it a directly appointed board or one convened by a third party? It does not matter which, as long as people are clear and as long as that relationship with government is clear.

As to the relationship with the NIC, R&D will be an important component of any new sector deal, so any replacement body ought to report into, and receive direction from, the NIC to make sure that everything is aligned. You do not have to have a big standing body all the time; it depends what advice you need at any one point in time. What might be more appropriate is a slightly more flexible pool of senior people which a chair could draw down on, depending on what question was asked.

If we go on to the question about whether the Government will look at the report that was given, my general view is that the officials who see the reports, as well as the Ministers, are very keen to have it and receptive to it. I have the expectation that the report will be acted upon and I would urge that the promises that were made are delivered. We are world class in some respects, and we are still very world class in waste management and decommissioning because we are performing some of the most difficult challenges globally, and there is no doubt that our industry and our science and engineering base in that area stacks up with the best in the world.

In the areas where your Lordships expressed concern last time, the areas where we are vulnerable are those of advanced fuels and advanced reactors. We were starting off from a base that was already vulnerable five years ago and there has been almost no investment in those areas since that time, which is why speed is of the essence in terms of the commitment to deploy the funds that we sought. We want to make sure that we do not drain out the subject matter expertise before it is too late.

Lord Hutton of Furness: I have very little to add to that, Chairman, other than to say that the industry itself was very strongly supportive of what Dame Sue did and what the whole NIRAB approach brought to the table. It is desperately important that there is a body such as NIRAB there to advise Ministers. If we are to make progress here and are to use the scarce resources that we have got effectively and intelligently, there has to be a proper guiding hand.

The Chairman: So, the sooner the better that we get on with that?

Lord Hutton of Furness: I think so.

Q55 **The Chairman:** Perhaps I may move on to the NNL. I think many of us are very impressed by the scope of the work it is undertaking—the support for the nuclear sector, advice to government—but it is an unusual model, to say the least; it has no core funding. There must always be a danger of conflict of interest or perhaps people holding back because they are not clear to what extent there is, indeed, an ability to avoid conflicts of interest. Is it a suitable model or could it be improved?

Lord Hutton of Furness: I think it is a model that could be improved. Setting it up under a commercial mandate makes absolute sense, but a question arises. If we want someone to occupy this advisory role—being a source of independent advice to government—we are pretty clear that the NNL could do that, if that is what Ministers wanted, but it would need to be properly resourced to do it, and just not in order to make sure we had the right expertise available when we needed it, but also to deal with

your point, Chairman, about conflicts of interest. Its role here in this regard was quite distinct and discrete and could not be challenged or called into question. I think the NNL is a highly credible organisation. The industry has a very great deal of support for the NNL and it would be one of the options, I think, that Ministers could look at if they wanted to find a way of managing the R&D spend and getting at the same time the best and most up-to-date scientific input to Ministers.

Dame Sue Ion: I would agree with what Lord Hutton has said. Certainly the commercial construct is valuable because it demonstrates that it is delivering competitively and with value for money, which is always a good point. In terms of comparators with other nations, every other nation that has a national lab uses that national lab to deliver high-level technical expertise into the Government of the day, but it pays those national labs an element, not necessarily huge amounts, of funding to make sure that, when wanted, the advice can be drawn down from the national lab or from the national lab in conjunction with other experts. Some form of adjustment to the way in which the national lab is funded to allow for that activity and to allow it to co-ordinate, if that is what Ministers want, would be appropriate.

The Chairman: So there is a case, is there not, for core funding there?

Dame Sue Ion: There is a case for core funding, yes.

Q56 **Lord Fox:** Dame Sue, you have already hinted, or said explicitly, that there is a time-fuse on the current skills we have to be able to take advantage of what opportunities for renaissance there are, so how would you characterise the time we have with the contemporary skills, and what will you both be doing or planning in your two organisations to develop the skills that we will need going forward?

Dame Sue Ion: It is time-critical because we are short in some areas. We are particularly short in what I would class as national lab space or in industry development space—what are traditionally called the technology readiness levels 4 to 6, so before it is ready for commercial deployment, but beyond the reach of the research councils. That is the area that was vulnerable at the time of your Lordships' previous review, and it is the area that is still vulnerable. It has not received the funds it needs, but the funds are identified within the NIRAB recommendations. It is important that that area of applied research is particularly is addressed. That is where you get your long-term subject-matter experts developed, who have 10 or 15 years' standing in the sector and grow to be internationally respected people. So it is important that that gap is plugged.

Within the university sector, the research councils have invested significant amounts over the last four or five years that have made a difference, particularly in the universities that have strong nuclear-focused programmes, such as Manchester, Sheffield, Oxford, Imperial and Bristol. The university base is in better shape than it was and that is reflected in the numbers in our landscape review, which is just published and which I think is available to your Lordships as you take this review forward.

One interesting dimension of the university landscape is the extent to which some of our key positions are underpinned by overseas nationals. When we are looking to sustain the UK skills pipeline, just in terms of loose figures, about 20%-plus of our leading academics are non-UK; between 50% and 60% of our post-doc research assistants are non-UK; and around 30% of our PhD students are non-UK. That is incredibly good for ensuring volume and capacity within the university sector and the high quality of personnel that you would want to have focused on nuclear-relevant issues but depending on Home Office policy and BREXIT outcomes it does mean there is a risk to the UK skills pipeline.

Lord Hutton of Furness: This is something that the Nuclear Industry Council and its work on the new sector deal will be looking at very closely. In recent years, we have been very good at mapping the demand for nuclear specialists and technologists. We have to be absolutely sure that we focus now on the supply side of that equation. We know where the pressure is building up, we know where the skill shortages are, pretty well. We just have to make sure that we spend the time that we have, and it is not particularly long, to make sure that we have a delivery mechanism behind the work that we have done on mapping demand. Things such as the National Nuclear College are going to be very important, but of course it goes wider and deeper than that. It is not just skills specifically in the nuclear sector, we should be worried about the skill challenges in the construction sector as well.

Lord Fox: The whole engineering field?

Lord Hutton of Furness: Yes, the wider engineering field.

Q57 **Viscount Ridley:** Can I go on to SMRs and particularly straight to the heart of what may be a bit more of a political question, which is: what has happened to the SMR competition? I think you will have picked up that this Committee is a bit perplexed by the contrast between the urgency that you are mentioning and that we heard in the previous session, on the one hand, and, on the other, the fact that we have not heard anything about the competition. It is now many months since we were due to hear something, and we were given no date last week by the Minister. Has this competition been kicked into the long grass, in your opinion, and, if so, by whom and why?

Lord Hutton of Furness: I honestly wish I could answer that question in the way that you posed it. We absolutely were delighted by the Government's interest in SMRs three or four years ago. This has immense potential for the UK and, if we are talking about the vision thing, it is difficult to imagine that SMRs would not be at the front and centre of that. We are, and remain, disappointed that, having kicked this off and risen expectations so much, we have not had anything back at the points when we were promised that there would be some way forward. I do not doubt for a second that there are some enormously big policy considerations sitting on Ministers' desks here. The decision to commit to the next generation of reactor technology—SMRs in this case—is a very big call, but that is what Governments are there to do. They are not there to avoid the big decisions, they are there to take the big decisions, and

this is probably one of the biggest ones, I would think, the Government will take in this sector for a generation. A lot will depend on getting this decision right. They have big decisions to make about whether they go for, for example, a smaller version of the current reactors that we are building or something of a more innovative design. Either way, if they are going to maintain the interest of the commercial sector here, they really have to be clear about which direction they want to go in and about the wider environment too.

Dame Sue referred to the benefits of a fleet programme, and they are overwhelming. It is absolutely clear that if we want to extract the most cost-effective and best technology solution, we should go for a fleet. Do we need a fleet price then for each of those reactors as part of the contract for difference or not? I think that we probably do. There are some very big decisions to make, and we have to be clear where the sites for these SMRs will be. We are not clear about either. So there are probably half a dozen really big big-ticket decisions to be made, and it is probably now time to make them. If we want the UK to have any skin in the game when it comes to the next generation of reactor technologies, I think this is the big call. The industry is very clear that we want the Government to crack on with this. We think that there is a great opportunity not just for plugging some of the low-carbon energy gaps we will have here in the future but plugging into a potentially very significant export market. NNL estimated that there is anywhere between £250 billion to £400 billion-worth of export market here. I think we should be in there and we should take advantage of that, but we have to make a decision. We cannot go forward in a vacuum; we have to know where we stand. I am confident from my conversations with Ministers that they know the size of the potential prize here, but I want them to crack on now and do the things they said they would do, which is to set out the next steps in this competition; otherwise there is a danger that it will fizzle out, and that would be a tragedy.

Dame Sue Ion: The Government have to come clean on what they are expecting from industry. Is it first to grid? Is it cheapest power? Is it the most UK jobs created in the derivation of a fleet? Is it maximum power for the sites available? You get a different answer technologically to each one of those questions or combinations of those questions. The Government need to make it clear to the sector what they want from a potential SMR mission, and that will help to narrow down the choices that would otherwise be made.

Viscount Ridley: Could you make the argument that the competition has, in a sense, blighted or sterilised that conversation about those questions because it has made it sort of semi-sub judice, if you like?

Dame Sue Ion: No, I do not think so. They have not gone far enough down through which questions each technology consortia should answer. There is a massive amount of benefit to be had. One of the questions to earlier witnesses was why would they do it, and it is because it is almost impossible to finance the large nuclear plants. They are extremely difficult because of the balance sheet implications for the companies that have to come together in getting the finance to get the build, so it is

capital outlay and timescale to delivery. That is where the SMRs, potentially, have a really big role to play with the much lower capital outlay, the much greater potential for building in-factory before you ever get to site and, hence, the shortening of the timeline for the financing, so a four-year delivery is not unreasonable compared with an eight to nine-year delivery on a large plant. That is a massive difference in the overall financial construct.

Lord Hennessy of Nympsfield: You have both vividly described this decision on the SMRs. It is a talismanic decision, is it not? It is indicative of so many things. Could it be—I have no idea—that BEIS was exhausted by getting Hinkley through? Also, there is the question of No. 10, which likes to call things in; it called in Hinkley. Could it possibly be that No. 10 is rather distracted by wider questions and that it will not make a move on the SMRs until it has gone through No. 10? It is a style-of-government question, is it not, or maybe it is? What do you think? You know the system very well and you know the people very well.

Lord Hutton of Furness: I obviously do not know them as well as I used to. I am not sure I can provide a definitive answer to why there has been a hold-up. Some of the issues are pretty big-scale issues and I think the Government necessarily want to make sure that they are setting the right compass point. We should also be clear that, if the Government decide, for whatever reason, not to go down the SMR route—which I think would be a great mistake, by the way—the future for the nuclear industry would still be a very positive one in the UK. We would be delivering major new projects and we have world leadership in decommissioning and in other areas of expertise. It would not be game over, but we would forgo, clearly, a very significant range of potential benefits if we decided not to go down the SMR route.

We, in the industry, believe very strongly that we want to see the UK in that developing space of new reactor technology; it is the role we can and should be playing. I am left to conclude that the reason for the delay is that the Government are reflecting on the enormity of these decisions rather than there being any other Machiavellian purpose or process under way—about which I know absolutely nothing, by the way. Either way, I think the time has come when we need to make a decision pretty quickly, if we are going to maintain the momentum that has been built up here in the UK in the last two or three years, where people are looking to us to be in the lead in the development of SMR technology. I hope that there is the ambition and the aspiration here in government to make sure that the UK nuclear sector can play that role in the future because I believe that we can and the benefits would be enormous for the UK.

- Q58 **Lord Vallance of Tummel:** I would like to come back to a question which I think you heard in the earlier session. The evidence we have had so far suggests that the UK market on its own is not enough to sustain SMR development and manufacturing industry, and therefore the future must depend upon overseas markets and so forth. First, is that correct? Secondly, if it does depend upon international markets and international partnerships of one kind or another, what is happening on the

partnership front? Who should we be partnering with? Is this a governmental question or an industry question? I do not know the answers.

Lord Hutton of Furness: The global market for low-carbon energy is enormous and, if we are looking to our future as an exporting nation, particularly a nation that exports high-quality, precision manufactured goods, I think there is a very powerful argument, as I tried to put earlier, for our being in this particular room, because the SMRs—small modular reactors—could meet a very substantial part of that global demand for clean energy.

When it comes to issues to do with commercial partnerships or joint ventures and who we should we work with, those decisions are a little bit further down the road, and obviously the Government have to be present while those discussions take place. The Government have to take the idea forward about how they want to bring forward the potential development of SMR technology commercially. There are a number of companies here and around the world which could be very important commercial partners in that, but that is a decision that can properly be taken only once we are clear about which path and what sort of technology route we want to go down. It will be a partnership, of that I am quite sure, between government and the private sector, but who those private sector partners will be is a question that cannot be answered at this stage, I think.

Lord Vallance of Tummel: We heard earlier on that this was a race and that the starting gun had already been fired. If you do not know whether this is a three-legged race or a race on our own, how do you think we are going to win it? Perhaps I could ask Dame Sue for her view. Who should be driving the idea, which is a big strategic idea, of getting into international markets, assuming we can crack the technology and the economics here?

Dame Sue Ion: In bringing together the various consortia that have pitched into the current competition, as it is, there are a number of globally significant players within that. On the comment about the race and the small window of opportunity, unless the UK decides that it wants to deploy on UK soil in a short timeframe, these systems will be deployed elsewhere. The first to market and the pull that it would bring will probably be more important for this initiative and technology than it would have been for other ones. If we are not in there with the first or one of the first to deploy, the UK will miss out. The technology will be deployed elsewhere and we will become a technology procurer again, as we are now, instead of a part-developer, grower of IP and manufacturer on a large scale.

Lord Vallance of Tummel: But can we do it on our own?

Dame Sue Ion: I think that there will inevitably be some form of partnership in taking forward whatever technology is chosen.

Lord Hutton of Furness: I would agree with that. I think it is perfectly possible to imagine a UK consortium taking this forward, yes, but I think

it will be a collaboration of some kind, and it may well involve partners from other countries.

- Q59 **The Chairman:** Moving on to Euratom, the Government are clear that leaving the European Union requires us to leave Euratom as well, and they quote the European Union (Amendment) Act 2008. If that is the case—and the Government in their White Paper do state that the precise relationship with Euratom is a matter for negotiation, but an important matter—do you think the Government are clear yet as to what that relationship should be, and how do you feel the timetable on this should work? What do you feel the relationship should be?

Lord Hutton of Furness: I am not sure that anyone really knows quite how this is going to end, where it will end and what the relationships will look like as we come out of Euratom. We would very much prefer to find a way to stay inside the Euratom Treaty, but it looks like that will be impossible. We have to avoid a cliff edge because in this context a cliff edge means that you cannot go on trading in nuclear goods and services, because you would be outwith the internationally recognised framework of nuclear safeguards. It is qualitatively different here in terms of having no deal as far as the Article 50 process is concerned, because even if we are out I assume we will be trading under some other international regulatory framework, WTO or whatever, but British companies can still trade goods and services. That will be immeasurably more difficult here, unless there is a set of transitional arrangements reached.

When it comes to research and development, I think we should look at the associate membership status that Switzerland has and their route to participation in some of the Euratom R&D programmes. That will not cover the full spectrum of benefits that we get from being members of the Euratom Treaty, including the safety and safeguards regime, so we will have to have a framework for doing that. I wrote to the Secretary of State a month or so ago when the draft Bill was published, asking him to set up a task force with industry and government together to plan the future, if we are going to leave Euratom. To date, we have not had a response from the Secretary of State to that letter. I hope it is forthcoming—I hope it is waiting to be signed off. I think that the thing to do is to sit down and develop a plan for this pretty quickly, involving industry, government and the R&D and science community, to make sure that we preserve the really important benefits of the Euratom Treaty going forward.

I am willing to accept the Government's argument that we have no choice in this context, given that we have made a decision to leave, because these two treaties have become so closely bound up together it would be perverse to leave the European Union but still find ourselves with membership of the Council of Ministers and seats in the European Parliament and all the other things that go with membership of the European Union. I wish there had been more thought given to this in the last nine months. If it were so obvious that we had to leave the European atomic energy community, I would have liked to have seen a little bit of some of that groundwork now so that we could be better placed to shape

the exit from Euratom. I do not think that work has been done and we do not have much time to do it now, I think.

Dame Sue Ion: I would agree with Lord Hutton in that. There were three important elements of the Euratom Treaty, and I gave evidence, with others, to the BEIS Select Committee last week. There are the arrangements for safeguards, which is the monitoring and the looking after of nuclear materials, where we will have to evolve other arrangements through our regulator with the International Atomic Energy Agency. There are the arrangements under the Euratom Supply Agency, which are nuclear co-operation agreements which allow any trade whatsoever to take place, whether it be services, goods, movement of materials. We cannot do any of that without other nuclear co-operation agreements and treaties in place which pretty much mirror what the Euratom Treaty says. That is what gives us cover, as a nation, to trade internationally in the nuclear world. Those are the important things that need to be fixed urgently. We cannot wait for the finalisation of Article 50 because, on the day that we come out, if we do not have cover, we cannot trade.

The issue with research is more of a negotiation. Sitting under Euratom has enabled us to move the best intellectual talent around Europe very freely and easily, which maintains quality as well as capacity. It has given us access to very high-cost facilities, us to theirs and them to ours, so some form of bilateral or trilateral arrangements will be helpful to ensure that that exchange and sharing of facilities and people continues. We have had leverage funding for very expensive research and shared knowledge and we have had influence in what gets researched within the European community.

The fusion part of the equation is very much more heavily impacted than the fission side, as Professor Chapman indicated in his evidence, and it is very important that arrangements are put in place to ensure that the UK's world-class expertise in fusion is maintained going forward. Our companies have had access to very lucrative contracts coming from the fusion side and we must make sure that our expertise, as a nation, is still able to be deployed in that. On the fission side, for research, waste management, geological disposal and current reactor operations, that has been possible and very helpful.

On the advanced reactor systems, to be honest, Euratom is not that helpful to us because the work that Euratom funds on advanced reactors and systems is tiny in the overall scheme of things because the Euratom Treaty requires unanimity of the member states and not all nations in Europe are favourably disposed towards nuclear energy and those that are not veto work on advanced systems, so that is not particularly beneficial to us.

The Chairman: Between the two of you, you have made a most compelling case for making sure that this is resolved—and resolved quickly, if one thinks of the implications of moving nuclear material around, for example, or the inspection of sites. If ever there were a case where the Government, surely, are culpable of a failure to consult and a

failure to anticipate, I think a lot of people in the nuclear sector, would say this is it—not least those at Culham, for example, who are heavily dependent on Euratom and were surprised, to say the least, to find Euratom mentioned specifically in the Explanatory Notes of the Bill. Is there a case here, given that it is so very different from all the other negotiations which have to be undertaken now for Brexit, for the Government simply to have an international consultation ahead of everything else and to say, “This is an issue that has to be resolved and we need help quickly to resolve this”, in case we face the cliff which Lord Hutton referred to?

Lord Hutton of Furness: I think we should press all the buttons that we can to resolve this in the most sensible way possible. We certainly need to open discussions with the Euratom organisation pretty quickly. I am not aware that we have actually started that yet either.

The Chairman: The Government are clearly well aware of how important it is, and they say so in the White Paper. It is a concern, but it is perhaps indicative, as Lord Hennessy would say if he were still here, of how odd it is that we always fail to ask the right questions at the right time. I am afraid that this is a fairly spectacular failure to plan ahead.

We have got to the end of the session. We have not been interrupted by a Division and, for once, looking at the screen, I am grateful to the usual suspects for going on for rather a long time. Thank you very much, Dame Sue and Lord Hutton, for helping us with our inquiry. There are a lot of issues which we are returning to from the 2010 inquiry and a lot more that have developed since then, which have become ever more urgent, but at least one has to recognise that nuclear is now, thank goodness, recognised as one of the pillars on which the industrial strategy will depend, and that is something we should recognise as an important development. Once more, thank you very much indeed.