



HOUSE OF LORDS

Economic Affairs Committee

Corrected oral evidence: UK energy supply and investment

Tuesday 15 March 2022

3.05 pm

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Members present: Lord Bridges of Headley (The Chair); Viscount Chandos; Lord Fox; Lord Griffiths of Fforestfach; Lord King of Lothbury; Baroness Kramer; Lord Livingston of Parkhead; Baroness Noakes; Lord Rooker; Lord Stern of Brentford.

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Questions 91 – 105

Witness

I: Ed Northam, Head of Green Investment Group—Europe & UK, Macquarie Group.

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Examination of witness

Ed Northam.

Q91 **The Chair:** Welcome to this meeting of the Economic Affairs Committee. Would you like to introduce yourself?

Ed Northam: Good afternoon. I am the head of UK and Europe for the Green Investment Group, which is part of the Macquarie Group, an Australia-based diversified financial services firm. Macquarie has been very active in the UK market since 1989 and, over the last 15 years, has invested more than £50 billion in UK infrastructure. The Green Investment Group has its origins as the UK Green Investment Bank; I was a founding member of the team that helped the Government to set up that institution. I led the investment banking business in the years before it was transferred or privatised, and moved across to the Macquarie platform in 2017. I am pleased to say that, since then, we have expanded GIG business to operate across 25 countries with a development portfolio of about 35 gigawatts around the world.

Q92 **The Chair:** Thank you very much for coming. Given that expertise, it is very timely to have you here. I will kick things off with a broad question.

You may have seen today that the Prime Minister has written an op-ed in the *Daily Telegraph* about energy security, and I will quote a bit of it: “We need permanently to reduce the cost of energy at source—and that will only happen if our supply is more secure, more sustainable and less vulnerable to manipulation by others. We need to take back control. Later this month, I will set out a British energy security strategy—how the UK will become more self-sufficient and no longer at the mercy of bullies like Putin”.

Given that overview, could you briefly set out what your top three priorities in that strategy would be if you were the Prime Minister? I am looking for headlines at this stage and we can go into detail as we progress.

Ed Northam: If we stand back, I think the UK has been a world leader in managing and leading the global response to climate change. The policy agenda and framework have been clear, and have driven a response to that challenge and the enabling framework that has built up around that—things like the creation of the world’s first dedicated green investment bank and the CfD regime, which has been transformational at delivering renewables at scale and driving down cost. That policy framework and the enablers around it have led the world.

Here in the UK, and equally in other parts of the world, the challenge now is how to move from policy to implementation pathways. That is where we get into the detail. At no time has that felt more urgent than in our experience of the last weeks and months with the situation in Ukraine. To me, it means a focus on how we accelerate both the pace and scale of this transformation to reduce reliance on imported energy supply and to “take back control”, as the Prime Minister described it in that op-ed.

So what do we need to focus on for that? For established technologies—wind, solar and technologies where the economics are well understood—it is all about removing the roadblocks. Planning and permitting need addressing. It should not take me 10 years to develop an offshore wind project. I should not have my solar projects rejected at council level, having been approved and recommended for adoption by the professional planning officer. Planning and permitting are a real issue that are slowing down the pace.

There is no shortage of capital. As I have said, the policy framework and agenda are really clear and are facilitating and enabling this transition. It is the pace and rate at which we can do it, and planning and permitting are a major area of that.

Investment in our grid and distribution networks is fundamental. Again, let us use offshore wind as an example: the wind is in the north and the load is in the south, so we need to build a system that can respond to that. Again, that is about pace and rate. We are all working on this, but it needs to happen more quickly and at a larger scale.

Then there is the supply chain and building up all the supporting capabilities to deliver this infrastructure. It is how we increase the scale of that supply chain but also how we support it in responding to its own set of challenges. Operating costs, labour costs and capital costs are going up. The supply of raw materials is both constrained and increasingly expensive. They are the areas on which I would encourage the Prime Minister to focus.

The Chair: That was an excellent overview. In your experience, what is the typical time that it takes to build a wind farm, offshore or onshore, in the UK? Could you give us a ball-park figure?

Ed Northam: Onshore wind has not been on the agenda. There is another challenge: we need to embrace the full suite of technologies that are available today. Offshore takes 10 years.

Lord Stern of Brentford: For clarification, it does not take 10 years to build it, does it?

Ed Northam: It takes three years to build and seven years to develop.

Q93 **Lord Livingston of Parkhead:** That addresses the question I was going to ask about planning, because planning comes into almost any subject that involves infrastructure, whether housing or broadband. I have lived through this and empathise with you. If you had, in a sentence, to say what has to change with planning—if you were doing government policy right now, for the DLUHC or whoever does it—what would be the one thing? Would it be centralisation or what?

Ed Northam: Listen, I am an investor and developer of projects.

Lord Livingston of Parkhead: Where does it go wrong?

Ed Northam: I feel less qualified to comment on how we solve some of these challenges. You will probably hear from others who are more qualified, but one observation I would make is about putting decision-making in the hands of people who have fewer vested interests or conflicts of interest in relation to that decision-making process. People need to stand back and look holistically at the agenda and what we are trying to achieve, rather than focusing on local issues and potentially even issues such as how it will speak to their electorate and how the local community will respond. Although that is all very relevant, it needs to be put in the context of the broader agenda.

Lord Rooker: If we were sitting here discussing housebuilding, planning would also be the number one barrier. On the planning issue, you discussed the UK. I paid my first visit to Shetland on holiday last summer. First, there are no trees there, because the wind never stops and, secondly, there are at least two large land construction projects of wind farms under way. When you say "UK", is it different in Scotland from England?

Lord Stern of Brentford: This is just to press on your question, Chair. I should declare an interest, because I was a member of the shadow board which with Adrian Montague set up the UK Green Investment Bank. I opposed its privatisation with all the vigour I could muster, but that is history: we are where we are.

In answering the Chair's question, you did not mention energy efficiency, storage or scale in Europe. Obviously if Somerset wanted energy security, it would be more challenging than for the UK as a whole. Similarly, this whole story has brought the European Union much closer together. Could you comment on energy efficiency, storage and the size of the group that you are in?

Ed Northam: I will come back to the first question about onshore wind. More onshore wind development is happening in Scotland than in England, so there is a difference in the approach north and south of the border, and we have seen the benefit of that: we have been able to proceed with some of our project developments in Scotland, while we are still held off here in England.

On Lord Stern's question, they were omissions and are very relevant to the need to address energy efficiency. Storage is a major issue that sits on the cusp of, or sits squarely on, where we move from the need to accelerate the pace and scale of the delivery of established technologies and where government intervention is still probably required—there are parts of the energy transition agenda where government intervention is still required.

Let us dig into the storage market. The installation of grid-connected battery solutions here in the UK is leading the European market. As of the end of 2021, 1.5 gigawatts of capacity have been installed, all of which was done on an unsubsidised model. We have invested in a 50-megawatt facility that we are building at the moment, and we have about 300

megawatts of projects sitting behind that. That technology is proving to be hugely efficient in providing grid-stability services and a bit of load shifting. However, that technology is all focused on short-term or short-duration solutions. We need to do more work on longer-duration storage solutions, including gas storage. As we move from grey to blue to green hydrogen, hydrogen will be major part of the solution. But we need intervention in that part of the market to drive that solution forward.

Q94 Viscount Chandos: Is the Government's energy strategy getting the balance right between decarbonisation, security of supply and affordability?

Ed Northam: I said before that UK policy is a global leader, and the focus now needs to be on the pace and scale of change. The trilemma that you describe is really interesting; this is perhaps driven by events, which have highlighted that. We previously thought about those three things as being in potential conflict, but they are actually now all working in unison. Renewable energy is the lowest-cost energy, on an LCRE basis, across large parts of the economy. As I mentioned, battery storage is being installed unsubsidised. We are seeing in Ukraine that affordability, security of supply and decarbonisation can now all sit together. So net zero is the way we are solving this energy trilemma.

Viscount Chandos: Do you think that is true in practice as well as in theory? We have talked about the length of time that it takes to get renewable energy, such as onshore or offshore wind, up and running. That could be improved, but it seems to me that there is a race between achieving that—and other initiatives, such as long-term storage—and making people feel that they have affordable security. One of our witnesses said, "Well, there's a new version of security of supply", but it seems to me that people want to feel that if they turn on the light switch, they will get light, and so on. Industry can rely on affordable energy. Making realistic assumptions about what can be achieved in accelerating or further rolling out renewable energy, what risk is there that there is none the less a gap that requires either better distribution of oil and gas or even some new exploration?

Ed Northam: From my lens as an investor and developer exclusively focused on the energy transition, I am clear that this is what I do. We can perhaps talk about nuclear being part of the solution here, and I am not saying that it is not, but it is just not my thing. So when I look at my part of the market, I do not see a gap. More than sufficient capital is available to us: increasing volumes of capital want exposure to this market, and by and large the risk-adjusted investment returns that we are offering for that capital are pretty attractive. There are established and proven technologies that can play a major role in this transition, and there are identified technologies that will move us from decarbonising the power sector to heat, transport and industry, which is the next part of this.

From my perspective, the gap is the roadblocks: how do we get out of our own way to ensure that we can deliver this technology more quickly

and on a larger scale? How can we facilitate the next generation of projects and technologies on an affordable basis as well as, again, at scale and at pace? So our roadblock is the ability for the private sector and government to come together and say, "Okay, where's that bottleneck? Okay, we've fixed it. Where's that other bottleneck? Okay, we've solved that". The solutions are not necessarily easy, and I am not suggesting that they are, but it is all about people's will and focus to do it, rather than saying, "Gee, we need to wait for this to develop or for that technology to come forward".

Viscount Chandos: On the planning roadblocks that Lord Livingston talked about applying to all infrastructure for however many decades, are you confident that they will be removed?

Ed Northam: I am not confident. As an investor and a capital provider, I put my capital in when I can see clarity that something will happen. I can tell you now that, as a developer, I experience those delays every day, and I continue to be frustrated by them. In my business I have a growing commercial and industrial demand to buy renewable energy for the projects that we develop, and I am short of projects. This not because I do not have a big enough development portfolio; it is simply because I do not have spinning assets or assets in construction that mean that I can say to a customer, "This will be operating in the next six or 12 months. I can commit to that, so you should commit to this offtake arrangement".

The Chair: So just to be absolutely clear in answer to what Viscount Chandos is saying, the main obstacle is the planning point.

Ed Northam: In that context, yes.

Q95 **Lord Griffiths of Fforestfach:** You mentioned a number of times that you are an investor. What are your major sources of funding?

Ed Northam: At the Green Investment Group we access Macquarie Group's balance sheet for our investment. I will give an example of one of the points that I was highlighting about the availability of capital and the need to scale up. For four and a half years, Macquarie shareholders were investing their capital, but in October last year we decided that our business has outgrown the capacity of Macquarie's balance sheet, and we are moving across into the funds management group within Macquarie so that we can mobilise even more capital—third-party money—to support the growth of our global business. So we are moving across.

Lord Griffiths of Fforestfach: Who are these funders, typically?

Ed Northam: These are the large pension funds, sovereign wealth funds and insurance companies that, first, are looking to commit capital to the market on a long-term basis and, secondly, are increasingly focused on energy transition, as many of them make the shift from carbon-intensive to low-carbon.

The Chair: Just on this planning point, I sit through conversations where people say, "It's the planning system", and then move on. Can you be quite specific, if possible? I have a document here from a trade body that

cites a few aspects of planning. It says, for example, that “there needs to be development and adoption of a strategic level approach to Marine Spatial Planning and the Habitats Directive derogation process across UK Government, Devolved Administrations and industry”. I do not know what this means. Can you try to shed some light on it? Is that the kind of issue we should be looking at?

Ed Northam: It is. These are real issues, predominantly for offshore wind. How do we deliver offshore wind technology in a way that is sympathetic to the marine environment and birds? Those are essentially the two big issues that we have. We need a clearer system that, ideally up front, has made decisions about where we support development and at what scale, with all the facts and considerations at hand. We need to do that better.

The Chair: Could you possibly write to us with some details, if you do not want to go into it now, about the specific planning points that need to be addressed? A summary would be useful.

Lord Livingston of Parkhead: Given that Macquarie is invested around the world, it would also be interesting if you could point to somewhere that is better and quicker and to give it a timescale—for example, instead of a four-year delay with planning, in country X it normally takes 18 months or something. As an investor around the world, you will have insight into a number of these things. It would be interesting to see who does it better.

Ed Northam: The short answer is that, to a greater or lesser extent, no one does. There are areas where we may have more success. On industrial land in Italy, for example, you can assume that you will get your project permit.

Q96 **Lord Livingston of Parkhead:** It would be good to know a planning regime that works well. Clearly there is a huge cost and there are time, money and risk factors to it.

I want to turn our attention to hydrogen. The Chair referred to the PM’s article about energy policy, in which he said that hydrogen has the greatest potential of all. That was nice to hear, because it has been the poor relation of the energy transition for quite a while. First, do you agree about the role of hydrogen? Secondly, from your point of view, what could the Government do to encourage its take-up and use in the transition?

Ed Northam: The short answer is that I agree. Hydrogen has an enormous role to play as a bedfellow alongside renewable energy. These things are highly complementary and need to be developed together in creating a new energy source for the UK and pan-Europe. In particular, it will create an energy source that will enable us to tackle some of the hard-to-abate areas of the economy—heat, in particular domestic heat, and transport.

Lord Livingston of Parkhead: On domestic heat, do you see hydrogen mixing with or completely replacing gas? Will it be a 20:80 or 30:70 mix?

Ed Northam: Mixing is really important. The next part of your question was what we should do. First, we need to accelerate the design of the business model. That has been coming for a long time and getting greater clarity on it is important. As investors, in many cases we do not mind what the rules are. We need to understand the framework, because that is the basis by which we can commit capital to the solution.

I encourage the Government to move quickly to look at blending in the distribution system. Some 72% of the gas distribution system here in the UK is hydrogen-enabled. It has transformed from steel pipes to HDPE pipes, so it is ready to go. There are slight variations in views, but you can blend up to 20% without really requiring any major retrofits. That is a case study or a use case, but the big thing on hydrogen is creating the demand. That is where the real gap is. Without the demand, we will not get to solve the cost equation and the cost curve. That is the area of focus, as I see it.

Lord Livingston of Parkhead: That was about framework and demand creation. In using hydrogen, you have talked about blending, but the other big use is storage. As you say, that goes hand in hand with wind, also there is the hard-to-abate sectors, propulsion for big vehicles or all of the above.

Ed Northam: It goes for all of the above. Someone was asking about proximity to Europe and this being a European challenge. It is actually a global challenge, but even across Europe there are differences. Europe is a lot more exposed to Russian gas than the UK is, for example, but it is an export fuel as well. We can shift energy around. We are developing projects, industrial clusters, which have hydrogen at the core of them, in both the north and the south: one is being developed on the island of Flotta, which will be an export terminal as well as for domestic supply; and another is around the port of Southampton. It has all those benefits if we can create a demand case that starts to really support the economics.

Q97 **Lord Rooker:** I am constantly told and read about the intermittency issue and problem that we have to solve. How can we encourage real investment where the market has a role in energy storage? I have read that the wind is always blowing somewhere, so we need floating wind. Is having more diverse renewables the answer, as well as other aspects of gas storage? What incentives can we have for companies to invest in storage to deal with the intermittency issue? It might not look like storage; it might look like a different way of generating power that we can switch on and off.

Ed Northam: That is a great question. The nirvana situation would be a single solution. It would certainly make my job as an investor easier if there was just one solution, but the reality is that there is not. We need a

mix of technologies and probably a mix of enabling infrastructure and support regimes to deliver the total solution.

I go back to an observation I made on storage. On a short-run basis, that market is growing very rapidly and without subsidies. We are an investor in grid-connected battery storage; we are a believer in that. We are also an investor in storage sitting alongside our wind and solar facilities, again to provide a firming-up of that intermittent resource. To me, as I said a little earlier, the solutions that we need to focus on now are longer-duration. How do we create an investment framework? I keep coming back to hydrogen as a big part of that. There is enormous storage capacity just sitting in the pipes in the distribution network, which can play a really big role here.

Then there are other technologies. On the way here, I was reading about an iron-air technology. My physics is not sophisticated enough to explain to all of you learned people what that does, but it strikes me as the sort of technology that will need some sort of revenue support mechanism around it, if we decide that it can play a major role in the storage solution.

Lord Rooker: What are the long and short stories? I have trouble getting my head around the issue, which was part of our briefing, about storage greater than four hours. When we are looking at storage, what sort of time factors are we looking at?

Ed Northam: For lithium-ion batteries, you are looking at discharge durations as short as half an hour up to four hours. That is just the nature of that technology and it will develop. It has developed from half an hour to four hours, so it will continue to develop. However, if we are talking about weekly storage capacity, again I go back to hydrogen as a good potential solution for that sort of duration. There is also compressed air. There are technologies out there and there is no panacea, short of what can be done through a combination of technologies. That is what we need to do.

Q98 **Lord King of Lothbury:** I will pick up the point that Lord Rooker has raised about intermittency. You talk a lot about other technologies, but as we follow a transition ultimately to net zero, should we think of renewables and oil and gas as complementary, rather than alternatives, in the short run? The intermittency problem means that we cannot just rely on hope in new technologies; if we will pursue renewables now, we also need a back-up. Would you in the Green Investment Group not think it your responsibility to invest in both renewables and oil and gas in order to ensure that you have a coherent transition, as opposed to something that is relying just on hope?

Ed Northam: I do not think that it is relying on hope, but you are raising a time element here that I fully acknowledge. Under our constitution, which was written by Her Majesty's Government, the Green Investment Group is required to invest only in technologies and fuels that meet one of five green purposes, which is something that we continue to adhere to,

notwithstanding that we are now part of Macquarie. Across the Macquarie Group more broadly, we are a supporter of and investor in natural gas solutions, and we have a long history in the oil and gas industry more broadly.

However, we can deliver this transition without being heavily reliant on the oil sector and unabated natural gas. So I think that natural gas is part of this transition.

Lord King of Lothbury: Is there not a problem here, in that if everyone says that they will not invest in oil and gas at all, the hope of having a coherent transition to net zero will be challenged because we have not done enough to ensure that we have the complementary sources of energy in the short run? If no one is willing to invest and people finance only renewables, it does not seem to me that we have a coherent transition.

Ed Northam: The market evidence suggests that there is still capital that has an appetite to invest in that part of the economy. However, I would be concerned if we let that happen and support it in a way that prolongs the transition that we have all increasingly grown to realise is more and more urgent every day. That is true if you have just spent time at the COP 26 conference and took note of the messages, charts, graphs and timelines described there. It is even more urgent as we think about what is happening in Ukraine. So unabated solutions or investment in oil and gas technology worry and concern me, particularly because we have technology available to do it smarter, better and in a way that will actually accelerate the transition.

Q99 **Viscount Chandos:** Wearing a different hat, I met with someone a couple of weeks ago whom I hope you would regard as a friendly competitor raising a green hydrogen fund. Their total focus for that fund, with a 10-year life span, was on difficult-to-abate areas such as shipping. Their view was that the use of hydrogen for storage was at the far end of that 10-year period. Do you agree with that? If so, is that not a further demonstration of the challenge of addressing intermittency in the short to medium term, rather than just in the long term?

Ed Northam: I agree. I do not know who that friendly competitor whom you are describing is, but I agree with their focus on the hydrogen-use case. I differ on the applicability of hydrogen storage, and the main area in which I think about that is our existing distribution networks. The reality is that gas—hydrogen—sitting in those pipes is available to deal with all our winter peaks, as the sun stops shining or the wind stops blowing for those periods of time.

If we are thinking about large-scale storage and building dedicated storage facilities, I agree, although I do not think that hydrogen is the best thing. However, in terms of using it as a fuel that is available for instant response in times of intermittency, it is available to us now, if we can regulate and mandate that there is a blending protocol and then ultimately move to higher hydrogen use—

Viscount Chandos: That is a big “if” on regulating for the blending.

Ed Northam: It has to be at the core of the policy that the Prime Minister is describing here. We have to create the demand case. That is a great first start, and it feels to me like an easy first start. I say that as an investor and a supporter of that technology, rather than thinking about everything that the Government have to consider, of course.

Q100 **Lord Stern of Brentford:** I want to link grid storage and gas, whether it is hydrogen or methane. Early on, you correctly emphasised the importance of the grid. Whether or not we are politically part of Europe, we are physically part of it, and, taking Europe as a whole, the wind blows in the north and the sun shines in the south, and you should ship all the solar up north from Spain and similarly ship all the wind down. The European grid is increasingly well integrated, and we are quite well integrated into it, in terms of the economics of its functioning. But in terms of its capacity and the blocks across various places, we need much stronger integration. The stronger that integration, the less storage you need, because you can cover very well by managing demand and supply.

So I suggest that the investment in the grid—including the Europe grid and our links to it—the storage story and the use of gas as a back-up are all very closely linked. The better the first two function, the less you will need gas as a peaking device. We have had earlier witnesses who have suggested that we already have all the gas that we need for the management of the story of intermittency and energy security. Could you comment on that?

Ed Northam: On that last observation, people who have appeared before you earlier are possibly better qualified to discuss the availability and capacity of natural gas. I reiterate my observation that it is one thing to have access to it and quite another to ensure that the emissions are controlled and ultimately abated. Carbon capture has to be a material part of the agenda, because gas has a role to play.

I 100% agree that if we can increase the interconnectability and efficiency of that across the European market, that makes everything easier: the need for additional storage capacity reduces and, quite frankly, the need for generating capacity reduces. So the scale that we have to achieve goes down. Although as an investor I want lots of projects and assets to put capital into, I see how that makes the whole thing easier.

I do not think it is just a technology issue, though. We find that just trading those positions across markets comes with complications. On bilateral trading, I often have a customer with a load requirement in Poland, for example, and I have generating capacity that is well developed in Germany. My ability to contract with that customer under a PPA—virtual, synthetic or otherwise—is impacted by the way some of the rules on those markets work. We need to make it interconnected in a commercial sense as well as a physical one.

The Chair: Without going into great detail now, it would be great if you

could give us some details in writing on that point as well.

Q101 Baroness Noakes: I think you said earlier that you did not regard nuclear as part of the Green Investment Group's remit. Could you explain that, given its low emissions energy source and especially as the Prime Minister has signalled today in his article that nuclear is a very major part of our future? Is it just an issue that affects the Green Investment Group, or is it a Macquarie interest overall? Are you invested in nuclear, or would you invest in nuclear?

Ed Northam: I need to be clear on this. What I said is a personal thing. Nuclear energy is not something that I focus on. From a Green Investment Group perspective, that is possibly still an accurate statement. When we look at the rest of the energy transition agenda, we feel that there is a big enough landscape, and more than enough to do to focus in on other parts of that technology landscape. To be clear, I do not think that would be a Macquarie viewpoint. I do not think that I can categorically say whether we have or have not, as a group, invested in nuclear, but I would be comfortable in saying that it is not off the table. In fact, I think it would be on the table, but for what I do and for the Green Investment Group itself, it was not in our mandate when we were the Green Investment Bank, and likewise we have not carried it across into the GIG mandate.

Baroness Noakes: Have you changed your mandate?

Ed Northam: We cannot change the green purposes that are entrenched in our constitution, and we would not want to. That is not the same as saying that nuclear would not fit into one of those green purposes. I have to be honest; I have not sat down and worked through with our scientists what the answer would be.

Baroness Noakes: Why are you ignoring what will be a big part of the energy environment, not just for this country but for many other countries in a net zero context?

Ed Northam: That is a very good challenge. I think it comes down in part to my response before. We have enough of a challenge in trying to deliver the technology that is here now. I talked about solar farms taking too long to develop offshore wind farms. If we start now on the second nuclear project, that is a 20-year time horizon. We talked about pace, scale and speed of the transition. I can see how nuclear is part of a medium or a longer-term solution. It will not to address the challenge that we have today when we think about new-build projects.

Q102 The Chair: I would like to ask a question about a different aspect of security of supply, which is reliance on China in particular for rare earth minerals for aspects of the technology that you deal in. How concerned are you as a business about that issue, and how concerned should the British Government be about that, as we look ahead to a renewables future? Is there a danger that we are switching one form of dependency on Russian oil and gas for another form of dependency on China for rare earth minerals and aspects of technology?

Ed Northam: That is also a great question: how worried are we? We are quite concerned. That might be a bit of an understatement. Picking on one of the commodities, silicone, 80% of the world's silicon supply comes from China, and the way that material is extracted is really concerning to us. It is something that, over the last couple of years in particular, has led us to refuse supply, or not to source panels and solutions from some of the suppliers in China because they cannot evidence to us how the raw materials have been produced. The term that we use is traceability. We want to be able to take the panel and say, "Okay, where have all the bits and pieces come from?", and trace them all the way back to source so that we are satisfied not only with where they were sourced from but with how they were sourced.

The Chair: I know that the EU is looking at aspects of how to secure supply. What would be a good response from the British Government on this?

Ed Northam: It is a multi-pronged response. The first response is how we improve domestic supply—and when I say domestic, I mean non-Chinese supply. Secondly, I do not think it is acceptable just to say that we will leave China to its own devices and leave it continuing to operate the way it operates. We are committed as a business to being proactive in working with suppliers to improve traceability and their process. We have focused our activities on a selected range of suppliers and are working with them to ensure that they can convince us that they are sourcing this material appropriately. So there is a commitment to work with the incumbent suppliers as well as developing alternative solutions.

Lord Stern of Brentford: Silicone is basically sand and heat, is it not?

Ed Northam: Correct.

Lord Stern of Brentford: There is no place without sand. Some places do not have much heat, but you can create that. You are not locked in there. It is just that China has developed capacity very quickly and at low cost. So you can compete, right?

Ed Northam: It is the cost. That is part of what we need to commit to: how we develop alternative supplies at scale that bring that cost down.

The Chair: Very good. Thank you.

Q103 **Lord Griffiths of Fforestfach:** Do you think that carbon pricing should be used more widely in order to stimulate investment?

Ed Northam: The short answer is yes. Carbon pricing has been an effective mechanism in Europe for promoting fuels switching, in particular from coal to gas. As a renewables investor, we increasingly factor carbon pricing into our project evaluation on the revenue side. However, to be more effective, it needs to cover a broader part of the economy, particularly heavy transport. We know the system that always encourages the lowest-carbon solution rather than leaves room for people to navigate their way around policy.

Secondly, for newer and riskier fuels and technologies, and the solutions around them, we need to create greater price stability around carbon. It is still quite volatile. We are seeing at the moment that it has moved from €20 a tonne to €140 a tonne. Interestingly, as we have seen fossil fuel prices rise in the last little while, it has come back down again, I think in recognition of the total cost of energy. That is probably a helpful mechanism, but the reality is that it is still quite volatile. If I am making a 20-year investment in new technology, I need more stability in the revenue line.

Lord Griffiths of Fforestfach: Do you think that the UK Government should do more in this area?

Ed Northam: I have said this before: I would encourage the UK Government to look at a carbon price.

Lord Griffiths of Fforestfach: For transport?

Ed Northam: Or encourage them to extend it to transport, but to create that stability, or at least a degree of certainty, in the carbon price. The use of a carbon price floor would be quite effective.

Lord Griffiths of Fforestfach: Why do you think they have not done it?

Ed Northam: I shall try not to give a cynical view. It is a market intervention, and like any market intervention it needs to be carefully considered; I acknowledge that. However, it clearly runs the risk that it will have an impact that is inconvenient or unintended or delivers difficult answers or solutions. Sorry, I did get a bit cynical there, didn't I?

Lord Griffiths of Fforestfach: I ask you just to be sceptical without being cynical.

Ed Northam: That is a much better word.

Q104 **Baroness Kramer:** I have a feeling that the question allocated to me is one that you have already largely covered. It stems from evidence we received that the Government talk about investment in the energy supply chain but focus on the generation of assets and forget investments in networks. One of the questions was whether you could help us to think about where the gaps are, where the Government are not providing support that could make a difference and where the private sector is not going to follow through unless some form of support is provided. It would be very helpful if you could give us that sense across the mix.

You have mentioned some aspects. You talked just now about newer and riskier technologies and what is needed to bring those forward. You have talked about next-generation rather than established technologies, looking at distribution and storage rather than just generation. I wonder if you could give us some clarity and thoughts about that.

Ed Northam: I will not go over the points that I have already made, but I will pick out some things that we have not talked about. Carbon capture needs government support. I actually wonder if it is not better sitting in

an RAB model where we identify the available solutions, deliver those solutions and socialise the cost. A number of you have made the observation that surely natural gas will be part of the generation mix going forward. I acknowledge that, but it should not be unabated, so we need to develop carbon capture.

I mentioned longer-duration storage and hydrogen. I think the other solutions sit predominantly in the implementation pathways rather than on the technology side. The grid is a great example; Lord Stern talked about this, and I entirely agree. How can we be more sophisticated about moving around that system the energy that exists across the UK, let alone across Europe? That should be a major area of focus and commitment. We work a lot with National Grid. They are a wonderful team who are, frankly, overworked—and perhaps underfunded, although I must say I do not really know—and who I think are overwhelmed by the scale of the challenge here. So how do we support them and bring industry to bear? Dare I say it: could a PPP model be developed on accelerating investment in green infrastructure?

Baroness Kramer: It is interesting that you mention the PPP model. Like Lord Stern, I would have hoped that the Green Investment Bank stayed in the public sector, but that is over and Macquarie has it. I think we probably all accept that when it was the Green Investment Bank it was fairly conventional in the way that it behaved, although it had the potential to be more like a European investment bank and play a role in bringing forward new technologies by picking up some of the key risk aspects.

What do the Government need to do? Do we have to find something that will almost play the equivalent of the EIB role in some areas, such as carbon? Is that the type of public/private partnership issue that you are getting at? Are we looking more at using carbon pricing, regulation or indeed the removal of regulation? Where do the Government need to focus their attention here?

Ed Northam: That is a great question—and that is the first time I have been called conventional, so thank you for that; I will tell my mother.

I actually do not think you need a financial institution. I think all the capital you need is available in the market and can be mobilised.

Baroness Kramer: Is it willing to take the real risk end of the spectrum?

Ed Northam: I think it is the framework that needs to be focused on and how you provide some certainty. There is a public purse here and there is the need to socialise some of those costs, but I do not think that resides in a mandate that you give to a financial institution. I am not sure whether the UK Infrastructure Bank, which some might say is the son or daughter of the GIB, was the right sort of market intervention to make.

I would encourage the Government to spend time with people like us and to focus on more on what enablers are needed to mobilise all the private sector capital that exists out there to fund this transition.

Lord Stern of Brentford: Do you think the EIB is surplus to requirements in Europe?

Ed Northam: I think of the EIB as just another bank. It provides liquidity alongside others in the market. It does that at a slightly lower cost, which is fantastic; I am always happy to reduce the cost to capital of my projects. It does it at half the speed, so there is a tension there. I do not see it, broadly, making a major intervention in the marketplace and ensuring that things happen that would not otherwise have happened.

Lord Stern of Brentford: That is an unconventional opinion.

Q105 **Lord Fox:** I apologise for my lateness; I had business in the Chamber that I had to attend. However, this question comes in at the right time, because you were talking about enablers. First, what can we learn from contracts for difference? Clearly they had an effect on offshore wind. Are there other technologies where CfDs can have an influence? If not CfDs, what other market arrangements—you started to hint at different models for carbon capture and storage, but for energy storage too—or financial methods can the Government put in place to deliver that capital that you were talking about?

Ed Northam: I am a big fan of the CfD regime. I think it is world-leading. In fact, I know it is, because in lots of the other markets where we operate they either are replicating it or want to do so.

Lord Fox: For the same technologies or for different technologies?

Ed Northam: For the same technologies, admittedly, but a large part of that might be because that is the lens through which we are looking at it. It has been hugely effective in creating price stability, and that is its major driver. That has enabled us to mobilise capital into this space and bring the costs down. Offshore wind is a fantastic case study to evidence that.

It is also a policy that has proven to be quite flexible and predictable. There is a framework there which investors can look at and say, "That's clear and we understand how it's going to be. It's going to have longevity, so I can now make long-term investment decisions".

I would cite as an example of its flexibility the recent move from CfD options every two years to every one year, because that is where the market opportunity is. I hugely applaud the creation of the LCCC, which creates a contracting entity that enables us as developers and project sponsors to have a party to deal with the issues that always come up on projects. These projects are not "set and forget"; they do not just happen. So to have a counterparty to talk to and work through those challenges with has proved—certainly for us and I think for the industry more broadly—to be really successful.

So I would cite the CfD regime, the budgetary regime around it and the built-in consumer protections as compelling reasons for why the CfD has been such a great instrument.

Lord Fox: But does it apply to other technologies? I think that is what we are interested in.

Ed Northam: It can, but it is not a panacea. What do I mean by that? It definitely has broader application, but it works really effectively where your fuel is free and you are focused only on your revenue line: "How do I provide revenue?" If I am looking at a blue hydrogen project, I have volatility on both sides. The CfD, as currently designed, does not currently respond to that.

Lord Fox: So what would you suggest for that?

Ed Northam: That might lend itself more to—I was going to say a capacity model, but it probably does not—maybe a tolling arrangement, where you are able to pass the input cost on to the end consumer.

Lord Fox: So in a sense it is a guaranteed margin, on that basis.

Ed Northam: Yes.

Lord Fox: And in terms of energy storage?

Ed Northam: Again, I will sound a bit repetitive here, but I would not touch the short duration market. In the longer duration, technology is part of the storage that I have been focused on in this discussion. It may be a CfD. I can see how that would work. I am really sensitive to ensuring that we do not cannibalise short duration, because that is working quite effectively. I would suggest maybe a long-duration capacity contract—some sort of capacity sort of contract. Those contracts were handed out.

Lord Fox: That in a sense is a rent for it, then.

Ed Northam: Yes, and if you can drive the cost of capital down to reflect the fact that that is a really low-risk investment, it will be effective in delivering the technology and doing it at the lowest cost.

The Chair: Very good. Thank you very much. It was a very rich session.

Ed Northam: Thank you for hearing from me.