HOUSE OF COMMONS

Energy Security and Net Zero Committee

Oral evidence: Industrial strategy for clean power, HC 712

Wednesday 26 February 2025

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Watch the meeting

Members present: Bill Esterson (Chair); Ms Polly Billington; Sir Christopher Chope; Torcuil Crichton; Wera Hobhouse; Anneliese Midgley; Luke Murphy; Mike Reader; Claire Young.

Questions 1-103

Witnesses

I: Darren Davidson, Vice President, Siemens Energy UK&I and Siemens Gamesa UK; Olivia Powis, CEO, Carbon Capture and Storage Association.

II: Steve Foxley, CEO, Offshore Renewable Energy (ORE) Catapult; Dr Marie-Laure Hicks, Head of Policy, Aldersgate Group; Pranesh Narayanan, Research Fellow, Economy & Environment, Institute for Public Policy Research.

Written evidence from witnesses:

- Carbon Capture and Storage Association
- Offshore Renewable Energy (ORE) Catapult

Examination of witnesses

Witnesses: Darren Davidson and Olivia Powis.

Chair: Welcome to today's session of the Energy Security and Net Zero Select Committee. Today is a continuation of the work of the previous Committee on the inquiry on the domestic supply chain and industrial strategy. In panel 1, we will explore the current status of the UK industrial strategy and barriers to domestic supply chain growth, emerging technologies such as carbon capture. It was going to be nuclear and carbon capture, but sadly our witness from the Nuclear Industry Association was unwell and is unable to join us. We have two very eminent witnesses who are going to give evidence to us. I will ask you to introduce yourselves briefly before we start the questions. Olivia Powis, you can go first.

Olivia Powis: I am Olivia Powis, chief exec of the Carbon Capture and Storage Association, the trade association representing CCUS.

Darren Davidson: I am Darren Davidson. I am head of Siemens Energy for UK and Ireland.

Q1 **Chair:** Olivia Powis and Darren Davidson, you are very welcome today. I will ask the first set of questions before passing to my colleagues to continue.

The OECD says that developing secure and competitive supply chains for clean energy technologies is crucial to ensuring a resilient transition to clean energy and economic security. How is the UK doing on that assessment?

Olivia Powis: There is huge potential for the supply chain in the UK in terms of supplying the CCUS market. At the moment, there are five projects that are about to reach financial close. Two already have in Teesside East Coast and we are expecting the projects in HyNet to follow very soon.

There is a huge potential for the supply chain market in the UK. In terms of being able to exploit that supply chain potential, we need to have certainty in terms of the pipeline of projects that are coming through. Around 80% of the CCUS value chain could be supplied by the oil and gas supply chain. Some 80% of that supply chain could transition over. At the moment, they need the signals to be able to do so. They need to know there will be projects for them to invest in.

There is a huge opportunity in the UK, but we absolutely have to know what the trajectory and the pipeline of projects are to be able to exploit that.

Q2 **Chair:** What do they need to hear from Government?

Olivia Powis: We have these first track 1 projects, but they need to know there will be a commitment to the track 2 projects, to track 1

expansion and future allocation rounds. It is about having a regular pipeline. For many of these companies, it would not be worth it to transition for one project here and there. They need to know that that investment and that transition is going to be worth their while. It is about having future certainty in terms of the scale of the opportunity and the timelines of that opportunity.

Darren Davidson: The good news is that we have the clean power plan now. That is a real step in the right direction. We have seen some positive action from that. If you look at offshore wind development, auction round 6 was deemed to be a success. That is back on track. As we move forward into auction round 7, some of the work that has been done in-grid has also been very good.

When you look at the action plan that we have in place at the moment, it is very much pushing forward on all aspects of that. There is a multitude of different technologies, to answer the difficult question. Some of them have got moving, but others, such as hydrogen and some forms of carbon capture, we need to push to get that visibility and that pipeline so key suppliers such as us can invest.

Q3 **Chair:** Are there areas that the UK is particularly good at, where we could do even better at and make the most of?

Darren Davidson: When you look at companies such as Siemens Energy, we employ 6,500 people in the UK. We continue to focus on development and pushing our organisation. We have recruited over 1,000 people in the last three years, which is significant. We see that growing as we move forward, once we have those pipelines.

You talk about where we are pushing and what we should be doing. We really need to stick to the plan. There is a plan that has been published. There is a mix of technologies in there. We just need to stay on track with the plan. There is lots to focus on there. If we want clean and resilient energy infrastructure, that requires investment. Companies such as us really need to have confidence in the plan that we have going forward. We have the plan. Let us stick with it and get on with it.

Q4 **Chair:** Is there confidence in the plan?

Darren Davidson: As I said, there are elements of the plan where we have been successful, such as offshore wind and the grid. There are some first-of-a-kind technologies, such as hydrogen. We have been discussing hydrogen for a number of years now. We have had some successes in hydrogen auction round 1. We are awaiting the results of hydrogen auction round 2. It is all about getting those first-of-a-kind projects started, so we can learn from things such as hydrogen.

That is typical with first-of-a-kind projects in carbon capture, such as the project at Teesside. Let us get moving on those projects so we can learn from them. We will benefit from that experience.

Q5 **Chair:** Are you encouraged that the Government's approach to industrial strategy is consulted on and is going to help support those first-of-a-kind technologies that you are both talking about?

Darren Davidson: To come back, it is a really strong statement of intent for what we want to do as a country. Again, it is about getting moving. Once we get moving on hydrogen, for example, there will be a pipeline and a confidence in the market and companies such as us will be able to see that pipeline and that vision. That would allow us to take a longer-term view on investment and jobs in the UK.

Q6 **Chair:** Olivia Powis, should the Government be focused on existing businesses or on new businesses, or on a combination?

Olivia Powis: It is a combination of both. There is an attraction to focusing on new businesses, new technologies and new manufacturing capability, and those are some of the areas that we have identified as high-value opportunities, but there is an awful lot of existing capability that could be drawn upon—and, as I mentioned previously, could be transitioned.

Focusing on our expertise in offshore, we should make sure we have a clear trajectory for those industries and employees to be able to transition across. There is a huge opportunity there. Much of our expertise in offshore oil and gas can be transferred over to CCUS. It is about the timing and the clarity in terms of when to do that and, like I said before, the scale of opportunity.

It is both. There are also new opportunities for us to invest in and develop new capture technologies and high-value manufacturing opportunities. There will be other countries that will also be looking at these opportunities because they are high-value opportunities for the whole industry. It is something that the Government can be focusing on and really particularly providing a pathway through.

We are quite good at developing new capture technologies in the early stages and providing innovation funding, but we need to enable those technologies to move from those stages to the point at which they can be deployed at scale in modular capture technologies. We need to invest in those to be able to exploit those.

Q7 **Anneliese Midgley:** Thanks for coming in, Olivia and Darren. I am going to ask a couple of questions around supply chain bottlenecks. First of all, to both of you, which elements of domestic supply chains would you say need the most development and what are the important bottlenecks for reaching the net zero targets?

Darren Davidson: From a supply chain perspective, Siemens Energy in the UK has been quite successful. Offshore wind is a really good example. Ten years ago we opened a factory in Hull, and today we employ 1,300 people. We did that because there was visibility in the market. It allowed us to invest in that site. That site is a major success story for the supply

chain. We had the visibility and we picked the right location for the factory. We picked Hull, and it has been a success story on the recruitment of people.

The key point to your question is that it relates to that visibility. We make sure we pick the right location to invest, but we also have a clear path on our aspirations from a skills perspective.

What makes it difficult to invest in skills and supply chain is the uncertainty on projects and what the market looks like. There is always a balance when new technology comes out about what is in the domestic supply chain and what we will rely on in the global supply chain.

To achieve the clean energy action plan, we will have to take a balanced view about what comes from UK manufacturers or the UK supply chain and what we take from an international perspective. To achieve our targets, we will need a real balance. We need to move fast and I don't think we have time to establish those supply chains, given the tight targets that we have. When we have visibility of supply chain and visibility of projects, Siemens Energy does invest. We have a track record of that.

Olivia Powis: My comment would be similar. One key area is providing ring-fenced funding for high-value opportunities where the UK has a competitive edge. There have been lots of studies done to identify these areas. They are offshore expertise or potentially modular CCUS technology. There are other high-value areas that we could exploit where we do not have existing capabilities, such as column vessels, where we could address shortages and invest in those areas.

Similar to what Darren said, skills are a bottleneck. Again, there has been a huge amount of studies done into the skills required. There was a good delivery report from the Green Jobs Taskforce last year. They did a lot of work into looking at what we need in individual sectors. The CCUS industry has already invested some of its own funding into developing new skills training centres. CATCH is a great example of this.

We sound like a broken record, but it comes back to this same point. The industry will respond on those skills shortages if there is a forward pipeline and a trajectory.

Q8 **Chair:** I think I heard you say there is a shortage in column vessels. Did I get that right?

Olivia Powis: Column vessels is one area of high-value opportunity.

Q9 **Chair:** Can you explain what you mean?

Olivia Powis: We did a study in 2023—I think there have been future studies—on the areas of manufacturing where there are high-value opportunities. Column vessels is one of those that was identified as an area where we could invest in the UK.

The skills shortage is a key area. I almost feel like we do not need to do any more studies. We know what we need to do.

Q10 **Anneliese Midgley:** What are the answers to that? The written evidence from the CCSA mentioned delivering "an able supply chain and skilled workforce" and said, "Government and industry need to work more closely together, with academia and civil society". How, practically, is that being addressed? We have heard at so many sessions that the skills shortage or gap is an issue. What practically do the Government need to do with industry to get that gap closed?

Olivia Powis: There are some key areas around things such as apprenticeship levy reform, skills passporting, which is an area where they are making progress, and re-skilling funds for green skills. Those are areas where the Government can play a role, and industry will respond and is responding already to invest in skills and transitioning.

Skills passporting, for example, is a really good initiative in terms of being able to transition from one industry to another and recognising what skills are required to be able to do that. Industry knows what to do. It is just about when and at what scale. There has been some good work in partnership and on the reform of the apprenticeship levy and on investing in funds for green skills. That is there. It all needs to transition and to move at the point at which it can be provided in order to deliver.

Darren Davidson: Sometimes we get mixed messages on the supply chain. From a supply chain perspective, this covers various aspects. It is not just about manufacturing jobs; it is about engineering jobs. For example, Siemens Energy does manufacture products in Hull, such as our offshore wind blades, which I mentioned, but we also do significant systems solutions-type activities. We have mechanical engineers, control engineers and protection engineers designing systems, especially for the grid.

One message that I would like to get across is that supply chain is not just about manufacturing components. It is engineering solutions, civil design and construction. That should not be forgotten when we talk about the supply chain.

We do a huge amount of investment in apprenticeship programmes. We have approaching 400 apprenticeships in our company, of which we are immensely proud. We continue to push that, but we also need to make sure that we can draw upon those skills from global resources as well. Fast-track visas for key skills is really important as well. That is something we have struggled with over the past 12 months. That is another aspect where you could support us.

Olivia Powis: We need that overview from Government. Many of the skills and workers will be the same across different industries. Nuclear, offshore wind, CCUS and hydrogen will have similar construction skills and engineering skills.

Having that clear pathway in terms of when these projects are all going to be deployed and at what scale will help those workers and those industries to map out and work out when they are required for certain periods for each project and when they can move on. There is some double counting on skills, if you ask each different sector. One of Government's roles—they have been working on this quite successfully—is to look at the overlaps between all the sectors.

Q11 **Anneliese Midgley:** You were talking about the reform of the apprenticeship levy. Do you have confidence in Skills England, the body being put into existence to look at apprenticeships and skills?

Olivia Powis: There is progress there. Things have definitely been moving in the right direction. They have been listening to industry about what needed reform to work. It does need co-ordination without the whole thing being centralised. It is just understanding across—

Q12 **Anneliese Midgley:** Olivia, what measures are the UK Government taking to mitigate the bottlenecks specifically affecting nuclear and carbon capture utilisation and storage projects? How well are those sectors being prioritised?

Olivia Powis: They have not been prioritised yet in terms of supply chain. One area is the funding that was set aside by the previous Government, the GIGA funding, which was going to be put into these high-value opportunity areas. That was 2023. It was then going to roll into the national wealth fund. We are now at a point where there still has not been any funding deployed into those areas. We spent quite a lot of time with the last Government identifying those opportunities and saying, "These are companies, products and services that could be invested in". Due to the change in Government and the timetables, that has not happened yet.

It does mean that there are some particular capture technologies, for instance, that have been caught in that timescale and have not had the intervention and funding that has been required.

Q13 **Chair:** The Government announced £21.7 billion over 25 years for carbon capture. Is that separate?

Olivia Powis: Yes, this was separate. This was the GIGA funding. The £21.7 billion is to flow through the business models for the projects. There was a separate pot of funding—I think it was £960 million, but not just for carbon capture; about a third of that was going to go to CCUS. It was specifically to address supply chain bottlenecks.

Q14 **Mike Reader:** Listening to both of you, I do not have the feeling that there is a lot of confidence in supply chain for emerging technologies. Darren, slightly paraphrasing, you said you have confidence in the bits of the clean power plan that are established. We have just heard that perhaps there has not been the right investment in the supply chains needed. How evolved are the supply chains for the various emerging

technologies within the clean power plan? What impact will that evolution level or resilience have?

Darren Davidson: I will take hydrogen, for example. Siemens Energy has hydrogen electrolyser capability and technology. We have a factory in Berlin where we manufacture that equipment. We make hydrogen-enabled gas turbines. We have a facility in Lincoln where we have manufactured gas turbines for over 100 years. We have developed that technology to be hydrogen-enabled. We do not have any projects in the UK to place those technologies at the moment.

Those projects are not just suddenly going to start; there is not suddenly going to be an abundance of them. We need to start with first-of-a-kind projects and prove the technology. Having a pipeline of projects, a pipeline of confidence, would allow us to invest in the market and make sure we have the skills, the manufacturing and the solutions in the UK. If you take hydrogen as an example, we just need to get moving and get started. You would probably hear a similar theme on carbon capture.

Just to go back to the point about skills, if we can develop the pipeline and confidence in what is happening, the skills discussion becomes a lot easier. Companies want to know the timing of when to invest. "How many apprentices do we need? How many people do we need to recruit from overseas?" If there is predictability in the pipeline—I accept that it is difficult—we will see ambition shown by companies such as us in the country. That is what we need. We need to build confidence, get moving and then look for investment.

What do we need from Government? You need to support us in those investment decisions as well. We are making a strategic investment. Siemens Energy has invested over £1 billion in the UK in the last 10 years. We employ 6,500 people. We are a significant investor. We need more support from Government to help us to invest more.

Olivia Powis: Yes, I would agree with that. That pattern could be rolled out. It is about having that clear opportunity and understanding; then, of course, companies will invest. The private sector has already invested many millions in the development of CCUS projects. There are now some projects moving forward, but there are an awful lot of projects that are being developed in anticipation of being potentially able to move forward.

Even as some of those now start to move towards FEED and the next stages of design, some of the supply chain companies that they are approaching are saying, "What are your chances of moving ahead?" They will then start to consider how much they will get involved. These decisions happen at every stage of development of a project. It is really important that this confidence is built into the sector and investors and companies can see where that opportunity is. These are starting on a smaller scale in CCUS at the moment. There are new training centres, new apprenticeships and new opportunities happening, but at a smaller scale. They would scale up.

Q15 **Mike Reader:** Do the Government have their priorities right on where they go with supporting supply chains? There is a clear message around Clean Power 2030. There is a very clear message around housebuilding. They arguably use a lot of the same construction and engineering supply chains. We have seen announcements on aviation, which again will be a significantly large drain on the supply chain. There are potential future announcements on new oil and gas drilling, which again is a similar engineering supply chain.

Are the Government focusing enough on what they need to do to deliver their core aims around the mission, such as clean power? Are they muddying the waters by committing to so many different projects that use the same construction supply chain?

Olivia Powis: It is clear that there is ambition. Clean Power 2030 is a clear ambition and a clear target. We can start to see how we will get there. If you work backwards from that, though, if we are thinking about low-carbon dispatchable power, gas with CCUS or hydrogen for power within the CCUS sector, we still need to know which projects are going to go next and when in order to get there by 2030. We are in 2025 now. Yes, we have those ambitions and targets, but it is the next stage of certainty that gives companies such as Darren's the opportunity to do that.

Q16 **Mike Reader:** Just to build on that, Darren, in June the Government will publish their spatial plan and the 10-year infrastructure strategy. Will that give you the confidence about where they want those projects so companies such as Siemens can bring in that investment?

Darren Davidson: We are working with our key customers at the moment on predicting what that 10-year pipeline looks like. On grid and wind, it is quite mature, especially offshore wind and grid. There is a real strong focus and a strong pipeline on what happens. Again—we are saying this all the time—it really comes back to the ambition of the other technologies and what we think we can achieve.

When we talk about pipeline, I really look at the offshore wind auction rounds. Looking at the next five to 10 auction rounds of eight to 10 GW gives you that predictability. From a hydrogen perspective, we need to try to achieve 500 to 1,000 megawatts every year for the next five years. We need to look that and have a clear path on long-duration energy storage. We need to have an ambition for SMRs. We also need a clear path on what existing gas generation looks like for the next 10 or 15 years.

In my opinion, the Clean Power 2030 Action Plan is a plan and an ambition. There is a mix of technologies in there. I really do not see the point of debating what is in or out of it and spending another year talking about things. It is a plan that has been signed off. We just need to move forward and attempt to implement it.

Q17 **Mike Reader:** If we take the emerging technologies within the clean

power plan and then think about the global supply chain and global competitiveness—there are countries around the world who are also trying to invest in floating offshore wind, tidal, carbon capture, et cetera—is the UK attractive in terms of global competitiveness for people to invest in those emerging technologies in the UK?

Darren Davidson: We have invested heavily in the UK. It is pretty much to serve the market in the UK to deliver those projects and to deliver that pipeline. From a Siemens Energy perspective, we are always in competition with new factories that are supplying product globally. Our role in the country is very much to serve the UK market. There are some exceptions. I talked about our hydrogen-enabled gas turbine product from Lincoln, which we export quite a bit. Predominantly, the majority of the jobs that we have in the UK are to support the UK market.

You are right to say that we are in competition with just about every other European country. They are trying to do the same from an energy transition perspective. We know the ambition of the country. We need to have confidence and move forward. If we get that ambition right, it allows us to invest or to look at long-term investment.

Q18 **Mike Reader:** I am coming to the end of my time, so this is my final question. Considering that global competitiveness and the supply chain in the UK, how mature is the UK supply chain compared with other developed markets?

Darren Davidson: I will give an example for offshore wind. We chose to manufacture our blades for offshore wind in Hull. One of the strategic reasons for that was because the majority of that product—we do export some of it—stays in UK waters. We have invested that. That is secure.

To go back to your point, we are in competition with other countries. Investment in the UK allows us to have a bit more confidence that the supply chain is secure instead of drawing that supply chain from global suppliers. That is a consideration that we need to have going forward.

Olivia Powis: Yes. For starters, we have a huge opportunity for CCUS in the UK. We have a third of Europe's potential geological storage. We have the industrial clusters that are located close to those geological stores. It absolutely makes sense. The CCUS plans and projects that are in development are very much going in the right direction for us to be able to meet the ambition of capturing and storing 50 to 60 million tonnes per year by 2035. We need to do a lot to get to that point.

We have this expertise in offshore, which we can transition. We have a real understanding in terms of the subsurface, the offshoring and how that works. We have skills and expertise in terms of manufacturing, which can be transitioned over.

We should not try to do everything in the UK. There is a global market in terms of the supply chain for CCUS. There are areas where we just will not be competitive and it is not worth us trying to be. There have been

studies done and we have identified key areas where we do have expertise and capability. We can build on those. It is about being selective and then really investing in those areas.

Going back to this point, having clear allocation rounds is absolutely the essential way to go in terms of knowing when and how much.

Q19 **Wera Hobhouse:** Welcome to the Committee. We have met relatively recently, and it was very interesting. You were already edging towards this, but in which specific areas is it not feasible to have domestic supply chains and why? Some of this you have already answered.

Darren, how do current import tariffs or trade barriers on low-carbon energy technologies affect the UK's ability to meet its net zero targets? What steps are being taken to address these challenges? We are getting into a somewhat complex area.

Darren Davidson: Yes. If you look at the products that we need and we draw upon, it is things such as transformers. If you look at grid reform or redesign, transformers are a key part of that. Transformers are a key part of supply chain challenge. From our perspective, we have had discussions about building transformer factories in the UK. The decision was made to invest in other things. I would genuinely say that manufacturing offshore wind blades is a better fit as opposed to some of those products where we are in competition with established mature factories and established secure supply chains. We are not looking at investing in those products.

Import tariffs do not really impact our project decisions. If we are to open a factory in the UK, we have to have high confidence that a lot of that product will remain in our projects in the UK.

Q20 **Wera Hobhouse:** During the long debates that we had around Brexit, we understood that supply chains are now very global or international. I remember that a seat in a BMW crosses a border seven times. That is just the seat in a BMW. That is a challenge if you do not have a strong manufacturing base compared with other countries. The UK manufacturing base has been relatively low over the decades. If the screw for your transformer is not manufactured here, that is one thing, but there are key components where you do not want to pay import or export tariffs because otherwise you would have double tariffs and all the rest of it. In which products is that particularly relevant?

Darren Davidson: We are quite fortunate as an organisation, because—

Wera Hobhouse: You are big.

Darren Davidson: We are quite sizeable as an organisation. We have multiple factories from Aberdeen down to Worcester doing a whole host of products in the energy transition. We did have some difficulties from a Brexit perspective, but we got our way around it.

Our ability to execute projects in the UK is not affected by importing products from Europe. We have found a way forward on that. We did have some difficulties at the start, but now we are regularly taking a lot of our products from Germany, Denmark and overseas international waters as well.

Q21 **Wera Hobhouse:** Is the problem mainly for smaller companies, and bigger companies do not have the same issues?

Darren Davidson: We are mature in that process now, I would say.

Q22 **Wera Hobhouse:** Olivia, is there anything you want to add?

Olivia Powis: There are some key areas around some opportunities where we do not necessarily have the domestic manufacturing capabilities, such as compressors or vessel manufacturing for CO_2 shipping. CO_2 shipping is going to be a significant part of the value chain. We would not do that here, but the monitoring and verification equipment on the ships is something that the UK has expertise in doing.

It is about finding those components of parts of the value chain. Other areas such as pumps, gas flows and storage tank manufacturing are things that we would not necessarily compete on internationally. They already have established global supply chains, so it would not make sense for us to do that in the UK.

We have real advantages in terms of those technical abilities around the monitoring and verification processes that will be required across the supply chain. Those are high-value areas where we can invest and have significant benefits.

Q23 **Wera Hobhouse:** Again, this is not just about things but also about people.

Darren Davidson: I was going to ask whether I could address that point. The one ask is on skills. We need people to execute this plan, to execute what we are trying to attempt. The ability to draw upon skills internationally is very important.

You should take away the point that supply chain is not manufacturing. Manufacturing parts and pumps is part of the thing, but manufacturing and delivering projects is heavily reliant on skilled people to engineer solutions. That is something that we should really push forward and draw upon. We need to get people into the country to support those projects in a faster way.

Q24 **Chair:** I am just going to step in. Are there parts of the supply chain that realistically we cannot have here, from either a skills or a materials point of view?

Olivia Powis: For CCUS, CO_2 shipping is an area that we have lost to south-east Asia.

Chair: So it is not practical to try to recreate that here. Okay.

Q25 **Luke Murphy:** Just very briefly, you were talking earlier about emerging technologies, the lack of pipeline and the uncertainty around that. I just want to talk about established technologies, particularly offshore wind, solar and onshore wind, where there is probably more certainty around the pipeline. Clearly, Siemens, does quite a lot in terms of manufacturing. Are we maximising economic value from those particular technologies?

Lots of people say that we are a world leader in offshore wind, but certainly all the evidence that I have seen and worked upon in the past shows that we are not maximising the economic value in terms of the manufacture of different parts of the wind supply chain. Yet we do have the pipeline and have had it for a while. Are we maximising it right now? Is there an opportunity still to do that? How would we do that?

Darren Davidson: There are some success stories on the supply chain. We will always go back to Hull and what we do in Hull. There are some strong examples, not just about wind turbines, but the connection of wind turbines and the substations we have in the North Sea as well. There are many examples. The foundations are made in some of our ports. We have a really strong collaboration with a company called Smulders on the Port of Tyne, which has been a real success story. They have moved production into the UK. We make the substations there with them.

You could focus on one or two components. You could look at the nacelles and why we make them in Germany—

Q26 **Luke Murphy:** Sorry, I take your point: we cannot manufacture every part of the supply chain here, and I am totally on board. I completely agree with you. If you look at the statistics on the job density and how much wind we produce as part of our energy system, we could have 100,000 more jobs. If we had done similar things to Denmark, the economic value and contribution to our economy would be much higher. We are lower than the EU; we are lower than some of our EU competitors. We are a world leader in rolling out offshore wind, but we are not a leader in manufacturing it. Have we missed the boat on that? Is there still an opportunity to capture more of those benefits? I know you can point to individual examples.

Darren Davidson: The progress we have made as a nation on offshore wind is admired. When you look at some of our other European countries, they look at the skills and expertise that we have in UK waters.

We transfer our skills. Siemens Energy shares people around the world to support on some of those projects. It is a regular feature of our UK workforce that they support projects around the world. We will never be the cheapest from a supply chain perspective. We will never be a low-cost country. That is just not where we are. Certainly, however, as we build up our expertise on all these technologies, such as carbon capture,

hydrogen, wind and grid, confidence in those projects would give us the ability to be global experts and do more.

Q27 **Wera Hobhouse:** I have a very small point. You have said that we have lots of research on this and we do not need more—we just need to implement it—but enough research been done to identify domestic alternatives for materials that the UK currently relies on importing? Should we be doing more research? Do we not need another report because we already know what is what, or could we have a little bit more research into those areas?

Olivia Powis: I am not sure what more it would tell us. The industry understands the supply chain. It knows where the opportunities are. The CCUS industry committed to a voluntary 50% local content target a couple of years ago. The industry signed up to that.

That was subject to having a pipeline of projects coming forward and the Government recognising in the bilateral negotiations at the final stages of projects that, if there is an opportunity to be able to procure local content, that will be recognised. If it is slightly more expensive in those initial stages, for example, but there is a clear future opportunity and there is an opportunity to build up that supply chain here, that is recognised in those negotiations. If we just go for the most cost-effective solution at the time, it may not always build up our UK local content. We have to recognise that, in order to do that, we have to invest. Then we will be able to export, with all the potential around that.

All the knowledge and understanding are there, and we know where the capability is. It is really about directing some funding where those key gaps are and enabling the industry to build up the capacity and capability. It is really about pushing forward and rolling out. The commitment from the developers in these projects is already there in terms of investing in UK content. It is just enabling them to do so.

Darren Davidson: We should also remember that UK content includes the servicing of these assets. There is a significant amount of resource, people and skills required to operate these assets and projects that we install over the next 25 or 30 years, which should not be discounted when we talk about local content.

Q28 **Wera Hobhouse:** We do not need more research; we need to implement those longer-term targets and, to the extent you can grow, local supply change will follow.

Darren Davidson: If you look at offshore wind turbines, the best example is the size that we are doing today compared with the size we were doing 15 or 20 years ago. It has significantly grown. The confidence in the technology and the innovation of the technology have vastly changed. That is what we are talking about from a carbon capture or hydrogen perspective. We start; we get experience of implementing

projects; we learn with the technology. That will allow a certain level of scalability on projects and size and efficiency.

Q29 **Chair:** Just to change the question slightly, there are products that we cannot source locally whatever happens. There are critical minerals that you can only get in other parts of the world. What more needs to happen? We have had some written evidence from the CCSA on this. Do you want to say a bit about what is needed to secure those supply chains that we are always going to rely on for import?

Olivia Powis: Yes. The critical minerals strategy really helped to set out some of this. It is an area where we are going to have to rely on importing. This is really about just identifying where those opportunities are. Again, we need to have that understanding in place in terms of what we need at what point to be able to move forward.

Q30 **Chair:** You said better collaboration especially with the EU. Have I got that right?

Olivia Powis: Yes. Working with our key partners, particularly with the EU, is a key area.

Q31 **Torcuil Crichton:** Thank you, Olivia and Darren, for coming in. Before I begin, I want to pick up Luke's point: in short, will we be buying 2030 targets off the shelf abroad, or do we have enough of a supply chain to do that here?

Darren Davidson: Without a doubt, we will need the global supply chain. For me, it is a trade-off. If we want to move forward and deliver on our 2030 objectives, we will have to draw upon what we can do in the UK today and we will have to draw upon the global supply chain for the other stuff.

To develop a UK supply chain will take four or five years and will require a strong pipeline of confidence to invest. That is something that we need to look at. To deliver those targets, we will have to have that balance between the UK manufacturing that exists today and can be stretched today and the global supply chain. That does not necessarily stop companies investing—I have just given an example earlier today. We have created 1,000 jobs in the UK in the last three years. With that confident supply chain, we want to continue to grow to create more jobs.

Q32 **Torcuil Crichton:** Olivia, what would help? There are these public sector institutions, such as the UK Infrastructure Bank and the British Business Bank. What do you want them to do? How can they help to create those changes?

Olivia Powis: The national wealth fund, previously the UK Infrastructure Bank, has a real opportunity and could take on the role that the previous GIGA funding had. It could identify particular parts of the supply chain that could help to build up their capacity and capability.

There is a real role for the national wealth fund to be able to invest in some of those smaller technology providers, perhaps modular capture technology, to enable them to move forward and expand to the point at which they are then able to operate at a larger scale.

Q33 **Torcuil Crichton:** Are these institutions risk-takers? Are they cautious? Where are they on a scale with commercial banks or commercial lending?

Olivia Powis: There is a question here about what gap they are filling. Are they filling a gap that could be filled by the private sector? They have to have a certain level of risk to ensure they are providing that added value and they are doing that. It remains to be seen; as I said, that funding has not yet been deployed in the supply chain.

Q34 **Torcuil Crichton:** Darren, you have a success story in Hull. There must be lessons from that about the obstacles and the difficulties in getting there. Can you give us a quick list of what gets in the way of building that supply chain?

Darren Davidson: One of the things that we have struggled with as an organisation is the timing of investment and support from Government and how to navigate the complexities of that. When we are looking at investments, it would be easier if there were a concierge-type service to set out where Government could help us.

We also accept that we need to be with you far earlier in that journey and start talking about what we are thinking of doing in the future. We tend to come to you and say, "We are thinking about this". We have invested £500 million in Hull over various periods. We have gone again and gone again. We have built again and extended buildings and things like that. We have always had a lack of engagement. We have had very little Government financial support in those financial decisions. I would look for Government to give us an easier route into those discussions about where Government can support us.

Q35 **Torcuil Crichton:** Everybody wants one door, do they not?

Darren Davidson: Is that feasible? It would be great for companies such as ours if we could come to you and say, "We are thinking of doing this in the next three or four years. These are the ideas we have", and have those robust discussions in one place with one person.

Q36 **Ms Billington:** Can I just follow up a little bit on that? It is interesting that you say you spent £500 million in Hull over a period of time, and that is good, but how much more benefit would that money have generated if there had been help from Government? I am very happy for Siemens to spend £500 million without any help from Government, frankly; I want to know whether the help that you are looking for would have substantially increased the scale of job creation, the income stream generated and the growth developed, particularly in parts of the world where you already invest, which comparatively need that economic rebalancing.

Darren Davidson: The speed of readiness would have been quicker.

Q37 **Ms Billington:** It just would have happened faster. It would have been more ready for 2030, if you had had one door.

Darren Davidson: Yes. We would have had a stronger supply chain. We would have been ready earlier to support the 2030 mission.

Q38 **Ms Billington:** In this context, when we are now five years away from the 2030 target, what value would there be in the kind of support that we are talking about not only in the 2030 target, but beyond, in terms of establishing us as a clean energy superpower beyond that target?

Darren Davidson: It would help us to make those investment decisions earlier. It would help us to navigate the pipeline aspect. It would allow us to invest in skills a lot earlier. From a people perspective, it would change our ambition. We might go from 6,500 people to 8,000 more quickly. We believe there is a possibility to grow quicker. It is about Government helping us, as an existing business, and looking at where you can support us. We would like a bit more support from you on that.

Q39 **Torcuil Crichton:** Because Olivia is here and I am Scottish, I want to ask about Acorn. Where are we with Acorn? Will it happen?

Olivia Powis: I hope it will. Acorn is a track 2 cluster project that was selected over 18 months ago. It has been investing at risk and long before that. Their journey to this point has been going on a number of years. We really hope the Government commit to moving that project forward. We need anchor projects to be selected very soon. That could be done now. We need to move forward with selecting anchor projects and then a commitment in the spending review that those projects will move forward.

Chair: Nicely done. You are getting bonus questions in by being so efficient in your earlier questioning. Mike Reader is now going to do exactly the same thing.

Q40 **Mike Reader:** I just want to pick up on something, Olivia. You have mentioned this GIGA funding a few times. If we had a Minister here, I am sure the answer would be that it did not exist. Did the money actually exist? The Government committed it, but was it one of the pledges where the money is not there because it did not exist in reality?

Chair: It was not ever budgeted.

Mike Reader: Yes.

Olivia Powis: We were under the impression that it was. It was in the autumn Budget post the commitment of the £20 billion for those first projects.

Q41 **Chair:** You mean by the previous Government?

Olivia Powis: By the previous Government, yes.

Q42 **Chair:** The £20 billion for 25 years was not ever budgeted. Was this any different? It only became budgeted by this Government. Is it any different to that?

Olivia Powis: I understand that it was budgeted. I do not know what is in there. We were working with the team on the very late stages of detail in terms of how it was going to be spent. Post-election, we were told that it was transferred over and would be deployed. It then got consumed into the national wealth fund. As I understand it, yes, it was budgeted.

Chair: We may pursue that with Ministers.

Q43 **Claire Young:** You have already mentioned the voluntary 50% UK local content rules. Olivia, what is your perspective on local content rules, especially for new and upcoming clean energy technologies?

Olivia Powis: Just to be clear, the industry committed to a voluntary ambition of 50%. It was not a rule. This was the industry really wanting to drive this forward. We had seen offshore wind. As the first projects started to deploy for CCUS, we wanted to make sure the UK was really taking advantage of this.

We worked through a subgroup of the CCUS Council, chaired by the Minister, to say this was something that industry wanted to work towards. We produced a supply chain strategy. It is all about industry working together to give those signals to the supply chain to say, "Look, we have this ambition to commit to 50% local content, and we will do everything that we can as industry to be able to do that. In exchange, Government, we need a pipeline of projects so the supply chain can see that coming forward and flexibility in terms of negotiations to recognise the role that local content can play".

There is a real desire among the industry to deliver on that. We have looked at some of what has been delivered. The first projects have not been published or communicated yet publicly, but there has been real progress in terms of trying to ensure we are driving that investment in the UK.

It is an opportunity for the UK in terms of transitioning away from oil and gas, but the number of projects in development in the CCUS industry has increased by, I think, either 600% or 600 projects over the last year. It has massively exponentially grown. There is huge opportunity here, if we develop the supply chain in the UK for our own projects. The huge opportunity is in terms of what we can export and the export potential. The UK is quite far ahead and it has the opportunity to be a real leader here, but we have to maximise this opportunity.

There are projects being developed in other countries across Europe and all over the world. We could be the supply chain and supply that intellectual property and those high-value components to that industry globally. That is where the real value is.

Q44 **Claire Young:** You say it is about sending signals, but are there any more concrete things that you are doing from your side?

Olivia Powis: It is an industry initiative to do this. It is an industry initiative to undertake the studies, to look at where the opportunities are and to invest in that. The industry has invested in skills and apprenticeships. The industry has done quite a lot to drive this forward. I am not sure how much more we can do, but at this point it is really about Government providing that scale of opportunity and clear pathway.

Darren Davidson: I would just like to take us to where we are today with the clean industry bonus. We are navigating through that now. We welcome that. It is a step in the right direction. It is a useful start. We welcome the principles behind it. We need to see how that evolves over the next few auction rounds and then we will review it. It is a start, and it recognises and rewards in-country supply chain.

Q45 **Claire Young:** If I can stay with you, Darren, the voluntary targets included in the supply chain plan under the CfD auction are difficult to enforce, as they do not directly score UK content. Ultimately, the tendency is to drive you back to choosing on price rather than origin. How can the Government improve the overall effectiveness of incentivising local content growth?

Darren Davidson: That is the intent of the CIB. That was the idea behind it. There are some doubts as to whether it is going to give what we need.

Q46 **Claire Young:** The key word in what I said there was "improve". Acknowledging where we are now, what more could the Government be doing?

Darren Davidson: I would probably go back to my original point. We have established the CIB process. It is in its first year and its first project. After auction round 7, we should look to see how successful it has really been. Where has that bonus gone? Does it stay with the project developers? Does it go into the supply chain? That is a discussion.

We also need to come together as an industry and with Government to say, "Does it work? Is it fit for purpose? Do we need to reshape it?" We should not just rip it up and start again. We should go for it and say, "It has started. We welcome it. Let's continue to look at it and make sure it is fit for purpose".

Q47 **Claire Young:** Moving on now to the question about the circular economy, we have been told about the importance of developing a circular economy and embedding better recycling practices to alleviate pressures on the domestic supply chains. How could that be implemented?

Olivia Powis: In terms of recycling infrastructure for CCUS, there is a real opportunity here. The reuse of pipeline assets for CCUS is something

that is being looked at in some of the projects and something that can definitely be taken forward, and so is recycling of infrastructure to support the reuse of critical materials. There are opportunities. We can repurpose infrastructure from oil and gas facilities.

Again, it has to be timed to make sure there are signals to do that and we do not lose that opportunity because we have too much of a gap and too much uncertainty. Passporting is another example of skills and expertise being reused. There is a lot of opportunity. So much of it is transferable for CCUS.

Darren Davidson: A couple of things come to mind. There are a number of newer products, such as recyclable offshore wind turbine blades. We are making sure that is a feature of everything we do going forward. We manufacture blades in Hull that are 100% recyclable. That is a change in the market from what we did 10 years ago.

We should also not underestimate the task of making all our facilities and factories in the UK sustainable. We are looking at factories that have been there for a long time, removing the need to use gas in heating and making their products more sustainable. That represents a big challenge. Government could support us in that transition so that those locations have longevity.

Q48 **Claire Young:** Should we be developing standards in this area?

Darren Davidson: Do you mean from a sustainability perspective?

Q49 **Claire Young:** Yes, particularly about being able to reuse and recycle.

Darren Davidson: From a products perspective, a lot of our customers are demanding those recyclable blades. That will be a norm for us going forward. I would also go back to my earlier point: having factories with zero emissions and having factories that are fit for purpose for the next 20 or 30 years will be really important.

We talk about investment, new entrants and things like that. Existing companies might have been on a site for 125 years are quite common in the Siemens Energy portfolio, and that represents a big challenge for us. The Government could be supporting us on that. New incumbents can think a bit differently and get some additional support. We need that support to keep our operations sustainable too.

Q50 **Ms Billington:** Can I follow up on that? We have talked about the fact that we are a leader in offshore wind globally. With honourable exceptions, such as the work that Siemens has done in Hull, a lot of the kit has been imported. We would not want to see a situation where we are creating things that are recyclable and asking for them to be recycled somewhere else. The recycling needs to happen here too. What is needed to create that element of the circular supply chain and ensure that, when those recyclable turbines that you make in Hull come back from the North Sea, they do not get floated off somewhere else to be sorted? We need to

make sure they get used here to do the repowering that will be required in the next generation of turbines.

Darren Davidson: That is a difficult question.

Ms Billington: I am here for the difficult ones.

Darren Davidson: The products that we are installing in the North Sea have a 20 or 25-year life. We have a plan in place about what we will do with that product at its end of life. That is a feature of the project plan at the start. That is something that project developers should work on, and we can work with them on that.

Q51 **Ms Billington:** Can I just follow up on that? It is interesting to hear you talk about 20 to 30 years. I have worked in a number of different areas of policy, and in energy what I am struck by is that fundamentally we need to be thinking in terms of 20 or 30 years to make good policy. We need to establish consensus across Governments, across electoral cycles and so forth.

One of the weaknesses we have seen in some of the representations we have had here and elsewhere is that people who know they need long-term certainty are saying, "That is a long way out". I say, "It is not really". There are already wind farms off my constituency. We are already talking about repowering them and getting new kit into them. I do not know where the supply chain benefit will be for this country or even for my constituents in doing that.

It is great you are doing that recyclability, but we need to start having an industrial strategy that includes a 20 to 30-year plan to make sure nothing is wasted. Apart from, "We would like more Government help", what plans does Siemens have, not just to make them recyclable, but to see a business case for doing the recycling?

Darren Davidson: Yes.

Ms Billington: It is all right. I am here for the difficult ones.

Darren Davidson: No, I understand the question. I am probably struggling to give you a comprehensive answer.

Ms Billington: I have put you on the spot. You can write to us.

Darren Davidson: If you look at our products, we look beyond 25 and 30 years. We have some equipment that we operate at Drax that was installed in the 1970s. We are constantly looking at re-lifing those components so they have an extended life. The back end of projects, when they come to an end, and the recyclability of those projects need a bit of thought. We will come back to you on that.

Chair: Olivia Powis and Darren Davidson, thank you very much for your evidence today. We would very much appreciate follow-ups in writing on the topics where the questions put you on the spot. I congratulate my

Committee members for managing to get their constituencies in on more than one occasion there. That is always good.

Examination of witnesses

Witnesses: Steve Foxley, Dr Marie-Laure Hicks and Pranesh Narayanan.

Q52 **Chair:** Welcome back to the Energy Security and Net Zero Select Committee and our second panel in our one-off session on securing the domestic supply chain and industrial strategy, which is a continuation of the work of the previous Committee on this topic. The panel we have for this session will consider international best practice and how the UK can compete for available resources. I will ask you each to introduce yourselves briefly.

Steve Foxley: My name is Steve Foxley. I am CEO of the Offshore Renewable Energy Catapult, looking at research and innovation for offshore wind, tidal and wave.

Dr Hicks: I am Marie-Laure Hicks. I am head of policy at the Aldersgate Group. We are a membership organisation that brings together businesses from across different sectors of the economy, civil society organisations and academic institutions that think that climate and nature action make clear economic sense for the UK.

Pranesh Narayanan: I am Pranesh Narayanan. I am a research fellow at the IPPR, the Institute for Public Policy Research, on the economy and environment team. I have done lots of work on our green industrial strategy programme.

Q53 **Chair:** Thank you all very much. Pranesh, I will start with you, please. Is an industrial strategy alone enough for the UK, or is long-term energy, security through a domestic supply chain for clean energy technologies best achieved by investing directly in projects and companies?

Pranesh Narayanan: An industrial strategy is vital to achieving the domestic supply chain. The previous Government's approach was ad hoc investments, such as the investment they made in the Tata Agratas gigafactory facility in Somerset. It was a one-off, piecemeal approach. It did not have the features of an industrial strategy that would help to develop an ecosystem and a supply chain.

What does an industrial strategy get you? It gives you certainty. We heard from the previous panel about having the pipeline, the clarity and the policy intent to see the vision, which gives businesses the certainty to invest. You need incentives. Once again, if you are trying to develop new industries and new supply chains, you need there to be a set of incentives for those initial first movers, who are taking on lots of risk and who are at the start of a learning by doing process. You need a strategy that co-ordinates and supports incentives towards those activities.

Finally, it is about economic conditions. We heard about skills,

infrastructure and lots of areas that Government policy touches. An industrial strategy is effectively an internal co-ordination mechanism within Government that allows them to align the needs of our future industrial base with our existing policies across Government.

Q54 **Chair:** Marie-Laure, how does the UK compare with other countries in terms of being a global leader in both innovation and manufacturing within domestic supply chains for low-carbon energy technologies?

Dr Hicks: It is a very broad question because there are many different technologies and supply chains. We can think of clean energy technologies, all the way from raw materials that go into production and the supply manufacturing to the deployment installation and all the services around that. There are areas where the UK has shown strong leadership, and there are really good examples of success stories. We have talked about offshore wind in this space, but there are other technologies that are being deployed at pace as well.

There are also real challenges around ramping up those supply chains, whether it is for the UK's ambitions or to meet global demand in this space. Lots of countries are decarbonising, and clean energy technologies are being deployed at pace globally. There is a real opportunity to scale up global supply chains, and the UK has an opportunity to try to build into this.

We have recommended that the Government take a whole-value-chain approach to industrial strategy, and part of that comes from asking our members to think about 2035 and what success or failure might look like for industrial strategy. There was quite a stark message that, without a good and a successful industrial strategy, our members felt that we would really struggle to meet our decarbonisation targets and decarbonise the energy system, partly because of that global competitiveness and the stringent demands that there will be on global supply chains to meet them. It is something where there is a lot of action that needs to be taken and a lot of opportunity.

Q55 **Chair:** Steve Foxley, can you give us some specific approaches and examples that the UK could potentially learn from other countries?

Steve Foxley: First, I welcome the industrial strategy and the focus on offshore wind. There are some good learnings in how we have used industrial strategy approaches in other sectors in the UK. As part of the Green Paper on industrial strategy, the Offshore Renewable Energy Catapult, together with the High Value Manufacturing Catapult, have submitted a response around how we could learn from the aerospace and automotive sectors to encourage more inward investment and domestic supply chains.

The proposal would be around the connected pathways approach, where you link the fundamental research programmes together with the innovation programmes, and then with the manufacturing testing system integration capabilities, to show industry at scale how that technology can be developed. That then encourages industrial adoption all the way

through to O&M. We have seen that approach being successful in aerospace and automotive. We believe that, if we were to do something like that in the industrial strategy, around connected pathways for offshore wind, that would be one of the ways of growing domestic supply chain.

Q56 **Chair:** Are there other countries where you can say that they did something as you have described and it has borne fruit, either directly in clean energy or something related?

Steve Foxley: That particular initiative is around good examples in the UK. If we were looking internationally, we have heard a number of witnesses talk about wanting that programme security and longevity, and in previous sessions I have heard the example of Germany being given, where they have had a 10-year programme and a 10-year plan for offshore wind. That is something else that we would like to recommend. The allocation rounds have been successful, and we have seen a dramatic drop in the price of green electrons, but to try to deliver that certainty that developers want, and the supply chain wants, we believe megaprojects would be a good way of solving this.

In addition to doing the 3 to 5 GW per year through the allocation round, could we look at strategic 15-GW megaprojects, strategically every four or five years, in specific geographies? That would then be something where the supply chain would have the confidence and longevity to look at inward investment and building manufacturing facilities.

Q57 **Chair:** Is there a proposal for a project of that nature?

Steve Foxley: We have drafted a paper proposing how we could use these megaprojects, and I would happily share it with the Committee afterwards to try to address those concerns.

Q58 **Torcuil Crichton:** To address our curiosity, where and what would be 15 GW?

Steve Foxley: If we were to look at the plan to get to 2050 and the gradual 3 to 4 GW per year, through the allocation round, our proposal is three megaprojects, at roughly 15 GW, over that 15-year period.

Q59 **Torcuil Crichton:** What would that look like and where would it be?

Steve Foxley: We would have to pick the geographies. We think those 15 GW should be in specific parts of the country.

Q60 **Chair:** You mentioned a paper before. You have not got to that level of detail in the paper.

Steve Foxley: We have highlighted that you would have to look at where to allocate those three projects.

Chair: Just not where yet?

Steve Foxley: Just not where yet, yes.

Luke Murphy: I want to come back to what Steve and Marie-Laure have said, and Pranesh might want to come in on this as well. It has been

mentioned across the two panels that offshore wind is a success story. It is in terms of rolling it out, but I do not believe it is a success story in terms of manufacture: if it were, we would have one of the largest wind turbine manufacturing industries in the world, if not the largest. Denmark has the 17th largest wind capacity and has one of the largest manufacturing industries in the world.

My question to Steve is whether that is because they do megaprojects. I am not sure that it is, because we have long had quite a long pipeline of wind, and we have not created the same economic value that others have. As others on the previous panel said, you can point to specific examples, but we have not maximised the economic value. Do you agree with that, and is there not a lot more to do? Moving on to emerging technologies is really important—I am moving to a question rather than testifying—but is that right? Are we actually maximising the value? Is there much more we can do, and what should we be doing?

I should declare an interest, in that the things I am referring to are a report that me and Pranesh co-wrote together. I should put that on the record.

Q61 **Chair:** I was interested, Steve, that you mentioned Germany, but you did not mention Denmark. Should we be learning from Denmark? Can we replicate what Denmark has done with the domestic manufacturing supply chain in this space?

Steve Foxley: I will respond to the Denmark question quickly. I think the challenges around fixed bottom have already been established, and the supply chains have already been created. Our opportunity is going to be in the UK around floating and how we can use capabilities, expertise we have and world-leading research and innovation to capture as much as possible of that floating wind domestic supply chain.

Dr Hicks: I completely agree that we should learn from international examples, and Denmark is one. The EU has also done some really interesting work on developing EU-based battery supply chains, and there are probably lessons to learn from other countries' failures, where they have invested in different technologies and it may not have gone their way.

This is where we think taking a whole-value-chain approach could really help drive this version of the industrial strategy forward, because different parts of the supply chain and the value chain have different challenges. If we look at the UK and manufacturing, there is a whole host of issues, such as very high industrial electricity prices, that make investment in the UK less competitive than in other countries. There are skills challenges. There might be some sectors that are struggling, and so they cannot bring in private investment as easily because they are viewed as less viable investments.

If we look at examples such as the amount of steel that is used in wind turbines, the Government are currently looking at a growth plan for the steel industry in the UK. Some 80% of a wind turbine is steel, and

currently very little of that steel is UK produced. If we are going to invest lots in the steel sector here, can we do it in such a way that equips them to then be able to participate in those supply chains?

Picking up on Pranesh's point, that is where the industrial strategy can help with that connection across different sectors and really pinpoint the specific issues that affect different parts of the value chain, to have that targeted policy intervention.

Pranesh Narayanan: I would like to add that the pipeline is important. That is a demand signal. That creates a signal that there is a market for a certain product. I am echoing the points of my colleagues here by saying that you need the other conditions in place as well. You need to ensure that there are skills and that the companies are located alongside similar companies in similar industries so they can learn from each other, and the industry itself evolves out of that. A strategic and co-ordinated approach is essential.

Q62 **Mike Reader:** You heard us finish the last panel talking about disassembly and recycling, and that is where I am picking up here. I will start with Steve but welcome input from all of you. What is required to provide more confidence to industry to invest in UK disassembly and recycling infrastructure for our clean energy technology?

Steve Foxley: In offshore wind we are just coming to the end of life of the first turbines that were put in 25 years ago. This is a new area where there is an opportunity for the UK to take a leading role. We have been doing a piece of work, which again I am happy to share with the Committee afterwards, looking at how we can decommission a wind turbine, component by component, the opportunity for recycling those components and where the regulatory challenges currently are in the UK that are making it difficult to recycle those particular components.

A couple of areas that come to mind are around blades and rare-earth materials. We have highlighted that we could have some regulatory changes in that space. There are already supply chain companies in the UK that are keen to get into that market, but just at the moment they do not have the conditions to do it.

Dr Hicks: There are two aspects to this. The first one is that, if we are going to have an industrial strategy, it really needs to work in tandem with decarbonisation and our net zero ambitions. It is an opportune moment to incentivise things such as the circular economy and more energy-efficient ways of manufacturing.

When it comes to those incentives, there is a little bit of bottoming out where the challenges might be. In Europe, we have increasingly seen regulation being brought in around batteries containing an increasing proportion of recycled content. The UK could look at similar mechanisms, maybe more focused on reuse or thinking about what is best suited to the UK market. That can help to provide market certainty and the level playing field for businesses that want to get involved.

The other element is making sure that recycling infrastructure is available and understanding what the pipeline of that infrastructure will be. That might not be at the level of an individual business or even an individual sector, and so the Government will have a role to bring together private and public organisations. Thinking about critical raw materials and supply chain security, there is a huge opportunity there in supporting more secure supply chains of critical minerals. The IEA thinks that up to 25% of lithium demand can be reduced just through recycling and reuse. That is an energy security question that the Government may also really want to focus on to understand how we can do that here.

There is also a business case lens to this in terms of how we can make businesses see the value. There are examples: in the Netherlands, the central bank is working on facilitating business model development and supporting businesses to make that financial case internally as well. That cross-piece package of measures can really help to bring it all together.

Pranesh Narayanan: I would just like to make a point on industrial synergies. Typically, countries are good at recycling the things that they can make. We are quite good at recycling glass and metals, but if you take e-waste, for example, most of our e-waste is exported to places such as Turkey. That is because we do not have a lot of the refining capacity and the expertise in those metals—at least at scale—to put together that infrastructure. The development of recycling should match up to the development of some kind of industrial base as well.

Q63 **Mike Reader:** Is this a global challenge? We have talked about Denmark having best practice in terms of manufacturing, but is there a global challenge here—that industry has not considered the recycling part of the job—or are other countries not having this problem?

Steve Foxley: I can comment on what I am hearing from our industrial contacts. They are exploring whether we can identify alternative materials, rather than struggling with those critical materials, so that we do not have such a high demand.

I will give you one example. We talked about steel that is used in towers on wind turbines. We have some DESNZ funding, working together with the National Composites Centre, and we are looking at using composite materials in the towers instead. We currently have a component as big as this room that is being tested in Blyth, looking at whether we can substitute steel out and use composites instead.

Q64 **Mike Reader:** Is that because composites can be manufactured in the UK?

Steve Foxley: Yes. There is our aerospace background, and they deliver something like 60% weight saving, with 20% less components. All of that has an impact on ports and logistics. One question is whether we can use alternative materials. Another is whether we can develop technology that eliminates the need for those critical minerals. A good example is a company called GreenSpur in Stockton, which is developing generators without the need for rare-earth materials. Developing those sorts of

technologies in the UK will reduce the demand on critical material recycling.

Q65 **Mike Reader:** On that project that you specifically referenced with DESNZ, are you also considering recyclability?

Steve Foxley: There are other programmes that are being funded through High Value Manufacturing Catapult, looking at the recycling of composite materials. It is not that particular funding, but I am aware of other innovation programmes.

Q66 **Mike Reader:** Given that we are talking now about there being an issue on recycling, if you are doing a study into new ways of building turbines, should the dismantling and recycling be part of that study?

Steve Foxley: It could well be in a future phase. The first challenges are whether we can replace that material and whether we have sufficient strength. What are the benefits? Where in the turbine does it make sense to use alternative materials? It could well be that we look at topics such as that in future phases of that programme.

Q67 **Mike Reader:** Marie-Laure, given that we have heard it is not feasible or desirable for the UK to specialise in recycling all materials in question, do you have any more views on what we perhaps should be prioritising?

Dr Hicks: It should be a pragmatic approach. There are some materials that we will have here, and some of that is linked to what we manufacture and what we develop, but then other aspects include, if we have offshore wind turbines and they are dismantled here and replaced in the UK, what we do with that end product. We need to think about the reuse of the materials that arrive here that are already finished, and what happens to them next and their end of life. There will be different sectors where there are more or fewer opportunities.

In terms of circular economy, we would love to see more circular economy embedded in day-to-day practices. It will be really important to see what the Government do with their upcoming circular economy strategy, and how that can feed in across different sectors of the economy. The EU has done a very ambitious programme of work on this, and so there might be lessons to learn there in terms of how it can be rolled out more effectively in the UK as well.

Q68 **Mike Reader:** My final question is to you, Pranesh. Picking up on the recycled economy strategy, would it be fair to say that, unless there is a commercial incentive for companies to consider recycling, they probably will not do it? That strategy has to have some proper teeth because, as we have heard, the industry has not even considered how they recycle and dismantle the things we built 25 years ago.

Pranesh Narayanan: There needs to be some return on the investment that they would make in order for them to invest in the infrastructure. If there is a lack of infrastructure, it is not just about financial incentives. There needs to be a player in the market who is able to provide that infrastructure before it even becomes viable to consider providing any

incentive to do that. Perhaps the way to resolve this is to directly target support at recycling through things like the national wealth fund and use that as a signal that this is an opportunity that businesses could take.

Q69 **Mike Reader:** Thinking about the manufacturing sector more broadly, we are having to bring in legislation, such as EPR and others, to get industry to recycle and take ownership of the products that they create. That potentially feels like something we would have to do here to really drive industry to do it, otherwise there is no commercial incentive for a commercial business to bother. They will ship it off to Turkey, China or wherever else, and probably leave it languishing somewhere. Is that a fair statement?

Dr Hicks: It is not just about a commercial incentive; it is also really about a level playing field. There are businesses out there that would like to be doing more, but they are placed at a competitive disadvantage if they are proposing higher cost measures because something is more recyclable later on. Regulation can be really valuable in providing that level playing field that drives ambitious action rather than a race to the bottom.

Q70 **Sir Christopher Chope:** May I apologise first of all for not being here earlier? I also serve on the Procedure Committee, and we had another meeting at the same time.

Can I ask about the hot topic of critical minerals, with the news that the United States and Ukraine may be close to signing an agreement in relation to some of Ukraine's critical minerals? To what extent do you think the United Kingdom should accept the reality that we have to import critical minerals because we do not have substitutes or equivalents ourselves? If we have to import them, how can we best ensure security of supply?

Dr Hicks: There are a number of different approaches. The first one is working with other countries and understanding how we can best secure our supply chains. The UK has spoken a lot with Australia and other countries around the world that are mineral-rich. Those partnerships will be really important.

The second aspect to it is also making sure that we reduce our demand on critical raw materials, such as by investing in innovation. As Steve has mentioned, there are technologies out there that are still at the early stage but can reduce our demand on critical minerals, whether it is perovskite solar cells in the solar power sector or sodium ion batteries in the battery sector. That is innovation where we can be less dependent on imports, but it is also a huge commercial opportunity for the UK to go and develop those technologies. There are many countries out there who are also in the same situation as us and do not have access to natural resources.

The third aspect is the recycling piece and making sure that we can have that domestic pipeline. We are still always going to need imports—there is only so much that we will be able to provide through recycling—but

bringing all of these different elements together is how we can help to secure our supply chains.

The last aspect is really raising awareness around this as a supply chain risk. This will affect many businesses, whether it is within the energy sector or other sectors. Anyone who uses electronics is dependent on critical minerals, so making sure that businesses understand that there might be risks there and that they need to factor that in in their own supply chains as well is a really important piece.

Q71 **Sir Christopher Chope:** You referred to the Australian memorandum of understanding. Is that really going to be sufficient?

Dr Hicks: That is something where I am less close to the detail, and it is something where the Government will have to keep maintaining that clarity of partnership and keep working together.

Q72 **Sir Christopher Chope:** We are closely allied to Australia—we are in the Five Eyes and all the rest of it—so we can probably trust the Australians, but we cannot really trust countries such as China, can we? How can we find alternative supply chains where the critical minerals are actually almost exclusively under the control of our potential enemies?

Dr Hicks: It comes back to that international partnership question and conversations with lots of different countries, including China, to secure our supply chains, but that longer-term question of having alternatives is where there is a real potential solution.

Q73 **Chair:** I am interested to hear, Pranesh, what your thoughts are on that question as well.

Pranesh Narayanan: We are actively doing research on this question at the moment, so I do not have too much to comment on aside from the fact that the memorandum of understanding is a start. It is not quite the full guarantee that the supply chain is secure. I can write back to the Committee once we have some more findings from our international research.

Chair: That would be very helpful.

Q74 **Sir Christopher Chope:** You referred earlier to steel. If steel makes up 80% of a wind turbine, and most of that steel is having to be imported, why are we not doing more to manufacture our own steel? It seems as though we are remarkably relaxed about that, considering how critical it is to our net zero ambitions.

Pranesh Narayanan: I would agree. Steel has been seen as a difficult sector because it is hard to decarbonise, and it is competing against incredibly low-cost competitors from places such as China. This is actually where a policy such as the carbon border adjustment mechanism could help quite a lot. It levels the playing field across our industry, which is investing in a cleaner way of producing steel versus industries in other countries producing very high-carbon content. That sort of measure would help.

Dr Hicks: The only point I would add is we have recommended that the Government carry out a capability study to understand where the steel sector has existing strengths that could support a pivot towards supplying more of these clean energy technologies, or where there is a challenge around the way the industry is set up here and the strength and capabilities it has, and whether there is a mismatch. The Government could go and find out more about that, to better understand how to support them.

Q75 **Sir Christopher Chope:** There may be circumstances in which it is more cost-effective for the United Kingdom, although it has the resources itself, to import. Would you accept that?

Dr Hicks: Yes, absolutely. There will always be a role for global supply chains in our clean energy sector. It is really that balance of understanding not only where there are opportunities for the UK, but where there are energy security questions, and we want to factor in greater resilience in the longer term.

Q76 **Sir Christopher Chope:** Could you give some specific examples?

Dr Hicks: I could give some in writing that might be more specific, if that is helpful.

Q77 **Ms Billington:** Can I just ask why you think none of these things that you are making suggestions about has been done before?

Dr Hicks: That is a very good question. If I knew, we would hopefully have solved it by now.

Q78 **Ms Billington:** I am deliberately probing for perhaps some understanding about the decisions made by policymakers in the previous decade or so that might have ended up with us being so reliant on global supply chains, importing not only critical minerals, but cheap steel, and what other decisions might have been made that might have left us in a more resilient position now.

Pranesh Narayanan: If you look specifically at decarbonisation, there was a big push to decarbonise as quickly as possible. That was the main goal, so considerations around supply chain and security of supply were less salient in those discussions.

Even before that, and I do not know if one person made this decision, there was an idea that the UK should be a knowledge-based economy, that the future was services, and that that is our specialism. We are of course very specialised in services, but a lot of the policy that was established in, say, the late 1990s onwards, encouraging people to go to university and expanding services sectors and things like that, did not necessarily consider the skills needs and other needs for industrial communities and the capabilities that they have.

It was not necessarily an active choice. It was more the focus had been on a different model of economic development, and we have now ended up in a situation where we have realised that there is actually merit to having an industrial base, and it is not just for the global supply chain

to—

Ms Billington: It has resulted in us basically having an entry system, which is slightly dependent on the throwaway attitude of ordering a pizza and chucking the box out, when actually we need to be creating and building stuff here that will drive us and power us.

Q79 **Luke Murphy:** Just to add to that, presumably it was an active choice not to have an industrial strategy.

Pranesh Narayanan: Yes. I think we have had 11 economic growth plans or industrial strategies over the course of the last 10 or 15 years. There has been a lot of chopping and changing, but the focus of a lot of those things has been on quite broad macroeconomic interventions, rather than some of these more targeted microeconomic interventions.

Q80 **Chair:** We are starting to get to the stage of the afternoon where members of the Committee are making statements and asking the witnesses to agree with them or otherwise. I am going move on just a bit. I will ask a question that we asked the first panel. Are there instances where importing is easier or more cost-effective, even when the UK has domestic resources available?

Steve Foxley: On fixed-bottom offshore wind, we have driven the energy pricing down significantly off the back of CfD. If we now want to try to capture some of that manufacturing, this is where we need to do the industrial strategy, the connected pathways that I talked about and the megaprojects. We also need to lean in to game-changing innovation here in the UK.

Just to put it into context, to deliver the 2030 targets that we have set to get to 50 GW, we have to make substantial improvements in manufacturing. It currently takes about three days to manufacture a blade; to hit the 2030 targets, we need to make them in a day. It currently takes us five days to install a wind turbine; to hit the 2030 targets, we need to install within a day.

If we want to develop that manufacturing in the UK, we need to be investing in innovation that then attracts the likes of Siemens and Vestas to come to build manufacturing facilities in the UK and take advantage of that world-leading research and innovation.

Q81 **Chair:** Your central point here is that this can be achieved: we can see a renaissance in domestic manufacturing, at the heart of the clean power plan.

Steve Foxley: It is a really hard challenge with where we are on fixed bottom. There are opportunities. As I mentioned, there are some incredible innovation steps we have to make, but the bigger opportunity is in floating. There are emerging technologies in those areas. The UK has real world-leading capabilities in that space. We are very lucky to have the ability to do fixed in the UK, but most of the global market is going to need floating. It is a huge export opportunity for us if we develop those platforms, cables, moorings and alternative materials. That is the way

that we will develop a domestic supply chain.

Q82 **Torcuil Crichton:** I want to ask about the carbon border adjustment mechanism and the role that CBM could play in sustaining domestic supply chains for UK clean energy. Steve, can you help us with that?

Steve Foxley: That is an area that I am going to hand over to my colleagues.

Pranesh Narayanan: As I mentioned earlier, it provides a level playing field across some of our more energy-intensive industries with respect to players such as China, which manufactures at high carbon intensities with very low energy costs. The UK is going to be slightly more protected against that scale of dumping on to our market if we have a carbon border adjustment mechanism.

For this to work, it is key that the UK aligns with the EU on the emissions trading scheme in the first instance, because that allows our steel manufacturers and, indeed, other energy-intensive manufacturers to continue exporting to the EU, which is their biggest market.

Full alignment on the carbon border adjustment mechanism after that is a defence, because once the EU CBAM is in force, that sometimes provides an incentive to divert exports—taking China as an example, exports from China to nearby markets such as the UK, if we do not have a CBAM. Aligning across the UK and the EU would protect us from that risk as well.

Q83 **Torcuil Crichton:** Dr Marie-Laure, how does this affect the UK's industrial competitiveness? We have really high electricity prices, regulatory burdens, reporting missions and the introduction of CBAMs.

Dr Hicks: We really welcome the introduction of a CBAM. As Pranesh has just said, it levels the playing field for UK industry, which is being asked to decarbonise. Therefore, it will be less subject to competition from countries where there is not a decarbonisation requirement. It manages that green premium that is introduced.

It is one part of a bigger picture, and it is still going to be a question of making sure that we create those demand signals for low-carbon products as well within the UK. We have a Government that are intent on building lots of things. It is a real opportunity to drive demand for low-carbon products and to pull that signal through the market and not just rely on regulatory pressures to encourage businesses to decarbonise. Similarly, that point around linking with the EU is really important, and it will help solve some of the issues we currently have in the UK emissions trading scheme, but it will also ease with that ease of trade.

One piece that is worth bearing in mind is that the EU CBAM is due to be introduced a year before the UK CBAM. There is that one-year gap that we will have to keep a close eye on. There are also new policies that have not been used before, so there is a real question around monitoring and evaluating and making sure that the policy is delivered in a way that works and does genuinely protect UK sectors.

Q84 **Torcuil Crichton:** Steve, are there instances where importing would be easier or more effective even if the UK has domestic resources available?

Steve Foxley: For me, it is the separation with what is already established for fixed bottom. For example, we have blade manufacturing capability, as Darren mentioned, at Siemens, but also onshore for Vestas, on the Isle of Wight. We are developing a really strong capability in cables. There is the JDR facility up in Blyth and the recent announcement around Sumitomo, but the reality is that for the other technologies there are already established international supply chains. For nacelles, for example, it would be very difficult to incentivise that manufacture into the UK.

The emerging technologies, whether it is around floating or tidal, are our chances to get as much domestic manufacturing content as possible. We should focus on supporting and investing in those emerging technologies for the future supply chains.

Q85 **Torcuil Crichton:** The lesson is that if you are first, you are first in the supply chain as well.

Steve Foxley: That is correct. We also have an opportunity around innovation. IPPR did a fantastic report: if we were to deliver 50% UK content of the 2030 targets, I think we would need three blade facilities, two nacelle factories, two tower factories and three cables. We know the size of the challenge ahead, and having game-changing innovation, connected pathways in the industrial strategy and megaprojects are probably the best chance we have to attract some of that inward investment.

Pranesh Narayanan: In terms of what we might need to import instead of relying on domestic production, solar is worth mentioning. It is incredibly energy-intensive to produce as a supply chain. I know that it is concentrated in China right now, but that is an area where the UK probably is not likely to develop capabilities.

Q86 **Chair:** Is it sensible to rely on China for our solar?

Dr Hicks: The big challenge is that the supply chain is globally so concentrated. If you want secure supply chains, diversification is usually one of the routes to that. It is not just a UK question; it is a global question.

On supply chains, Baringa did a really good study for DESNZ last year on supply chain readiness for clean energy technologies. They really pinpoint specific areas where there are potential bottlenecks coming up that are known. That information is there and available, and that can help inform Government policy and next steps in terms of what is done domestically or internationally as well.

Q87 **Chair:** What about learning lessons though? Steve, you have touched on this a few times, in terms of the difference between fixed-bottom and floating offshore wind being a very good example. We had a lead in fixed bottom at one time. We no longer have that domestic supply chain, if we

ever did. How do we make sure we learn the lessons from losing that lead in other technologies and secure that long-term supply chain and manufacturing base in this country?

Steve Foxley: If we look at the policy that was used, CfD, it basically had three intentions: to deliver cheaper electricity, to develop supply chain, and to fund innovation. One of the lessons learned is a single policy to try to deliver all of those three outcomes is difficult, and that is why having the industrial strategy and these connected pathways will give an opportunity for other mechanisms for future opportunities.

We have heard a lot about certainty and confidence in these Committee hearings. That is why I think something around large megaprojects will then create enough momentum for people to invest in local manufacturing capabilities. Those are probably the lessons we have learned from fixed bottom, and if we could apply that going forward, we would have a better chance of a bigger domestic supply chain.

Q88 **Chair:** Do you cover this point about the effect on the wider economy in your paper on megaprojects that you referred to before?

Steve Foxley: Do you mean in terms of the impact on the wider economy?

Chair: I mean on the supply chain and the long-term certainty for manufacturing as well.

Steve Foxley: Yes, the paper covers that.

Chair: Good. We look forward to reading that.

Q89 **Claire Young:** What lessons can be learned for UK manufacturing from the US Inflation Reduction Act, the EU green deal industrial plan and the EU Net-Zero Industry Act? Just to clarify, I am talking about the IRA as it operated under the previous Administration.

Pranesh Narayanan: The Inflation Reduction Act was a clear long-term signal of intent, backed up by quite enormous spending, and the results were quite clear. You do not see it immediately in manufacture output. You see an enormous spike in manufacturing construction spend. There was around $8 billion of monthly manufacturing construction spend between 2015 and 2022. You see the Act passed, and then, in a matter of a couple of years, that monthly spend becomes $20 billion. It really did spur on a quite rapid scale-up of manufacturing capabilities.

A large chunk of the funding was through tax credits, with about $220 billion committed over 10 years, across lots of different types of projects and lots of different types of technologies, and about $40 billion committed through consumer tax credits, for people to buy electric vehicles, energy-efficiency upgrades in their homes and things like that. It took a dual-sided approach, with both the demand side and the supply side.

It had issues with some of the challenges around wider economic conditions. A lot of the projects had issues with getting planning permits

and things like that. The American landscape is quite complicated. The institutional arrangements are quite different from ours, so I do not know what lessons we can actually learn from those examples. What we can learn is about the long-term nature of it. It was backed with significant amounts of funding; that might not be possible for us, but it was for them, and that created a very strong signal.

On the Trump question, I should mention that Trump did enact an executive order that looks like it is cancelling the programme, but it has actually paused the spending through federal loans and grants. However, the bigger chunk of the spend, the tax credits, are written into the American tax code. They need to pass legislation in Congress before any of that is repealed. As far as the current state of play goes, the biggest chunk of spend through the Inflation Reduction Act has been preserved, but there are certain infrastructure projects that were receiving loans from the federal Government that are facing a lot of uncertainty right now.

Q90 **Claire Young:** Just to follow on that point, given we have moved on to the issue of Trump, what impacts do you think the changes that he has made will have on the global supply chain for materials and skills?

Pranesh Narayanan: It is very difficult to say right now because they have paused it. There is a lot of uncertainty. We do not fully understand what is happening, to be honest. We will have to just wait and see, and I think that is effectively the approach that a lot of businesses will be taking as well. The overall approach that Trump is taking is just generally creating economic uncertainty. That is going to have an impact, and not just on clean energy supply chains; every kind of supply chain is facing some kind of impact.

Q91 **Chair:** Is there a potential for it to see increased investment in the UK because of greater certainty here?

Pranesh Narayanan: It is possible. If there is that clear signal that the UK is committed to clean power and its supply chain, the policy certainty could help, but, as I said, policy certainty is one of many factors that influences decisions to invest. We will have to look across the board.

Dr Hicks: Irrespective of what is happening in the US, the clean power mission in the UK has been received as a very clear signal by both the industry and investors. The Government's next steps, in terms of how they roll out the Clean Power 2030 Action Plan and how they take policy action where we know there are policy-related bottlenecks, such as with the connections queue or planning reform and so on, will keep building that confidence in the market as well and can continue to make the UK an attractive investment venue.

Q92 **Chair:** I have a very quick question for all three of you, and a one-word answer will do. The CBI published a piece this week saying that there was a 10% growth in the clean energy economy. Are all of you in agreement, broadly, with those findings?

Steve Foxley: It was a quite compelling report, wasn't it, in terms of the impact we have had? From my interactions with industry and what I see on the ground, you can see it is a growing economy.

Dr Hicks: It is net zero, so it is clean energy, but it is also the homes retrofit sector. It is a really broad categorisation, and it shows the real opportunity that is available here.

Pranesh Narayanan: To add to that finding, a report by the Tony Blair Institute also found that the clean energy and net zero market globally is expected to be about $7 trillion. It is expected to see stronger growth than other areas. Historically, people might think that the transition is stalling, but 2024 saw $2 trillion-worth of investment around the world in clean energy technology and infrastructure, whereas fossil fuels received $1 trillion. Actually, clean energy investment overtook fossil fuel investment as far back as 2016. It has been a staggering upward trajectory. It is the future. In terms of where growth opportunities are, it is a really strong one.

Chair: Apologies to Luke Murphy for stealing a question he was probably going to ask.

Q93 **Claire Young:** Can any of you comment on the EU green industrial plan and the EU Net-Zero Industry Act?

Dr Hicks: One thing that is useful to think about is that the UK does not have the fiscal firepower that the US had with the Inflation Reduction Act, and the EU shows a very different approach, which is mostly regulation-driven and driven with a lot of investment in shared R&D funds and so on. It is another one to learn lessons from and to see where there are opportunities that the UK could look at. It is also something where the UK is involved in European R&D programmes, and so there is a real potential for collaboration there as well.

Steve Foxley: It reinforces the connected pathways approach that I was talking about.

Q94 **Claire Young:** Is there sufficient alignment between UK domestic and international product standards to ensure that exports in the low-carbon energy sector are both feasible and competitive?

Dr Hicks: Do you mean standards on low-carbon products?

Claire Young: Yes.

Dr Hicks: We are expecting the Government to consult on their voluntary standards on low-carbon products. We are really looking forward to seeing that consultation. It is something that is quite a complex and technical space for businesses to operate in. In some sectors, there are multiple standards that organisations have to navigate. One element that we are very cautious around is that quite often voluntary standards do not necessarily drive that overarching change. There is a case for

mandating standards where it is appropriate for that standard to be mandated.

There is a lot of work to be done in this space, and it is something that will also be able to inform things such as green public procurement or broader initiatives where businesses can help drive demand across their supply chains by applying certain standards for low-carbon products.

Q95 **Claire Young:** Where the UK is innovating in emerging technologies, what is the potential for that UK innovation setting future international standards for other materials or products in wave, tidal and floating offshore wind?

Steve Foxley: If I take floating first of all, the UK has amazing experience from oil and gas around dynamic cables, moorings and platforms and how to control, for offshore wind, the pitch while it is on the floating platform. That is going to be an area where, if we lead the R&D on it, we can then control the design; we can then set the standards for that technology. That can be a massive export market for the UK, so there is an area where we absolutely can do it.

Tidal is another good area. At the moment there has been 120 megawatts contracted, with 20 MW operational in the UK, but that technology has 80% UK content in it. Again, if we can be leading the R&D in that sector, setting the standards, that will then have export opportunities for us as well.

Pranesh Narayanan: I would add that setting the standards would be really important, but it is not a sufficient condition to develop an industrial base. It would give us a version of a competitive edge, but we have issues in the UK with scaling up and commercialising innovations. We are very good at making and innovating, creating lots of patents and things like that, but there is a specific challenge around how you get that innovation to be produced in the UK. It is a problem that is common across lots of different sectors of the economy.

Q96 **Luke Murphy:** Do you think we have enough state capacity and commercial expertise within Government to deliver a successful industrial strategy to build up our supply chains in the way in which we have discussed today? Other countries that have successful industrial strategies tend to have more expertise. It involves quite important commercial expertise and depth of knowledge of supply chains and the ability to do that. Do we have the right expertise and capacity to do that?

Pranesh Narayanan: We have lots of expertise and capacity, but potentially not in the right places. We certainly need to bring them in closer to the centre of Government. There are organisations such as the Catapult organisations. Regulators have lots of quite deep expertise in certain markets. It is when it gets to the centre of Government that there is a slight lack of deep and technical expertise. I would even point to

something like the national wealth fund, which is capable of building deep expertise, especially in the investment side of making those decisions.

The solution would probably be to have much more open communication lines between the centre of Government and indeed local government; the mayoral combined authorities will have information about their specific challenges and economic capabilities on the ground. I do not know whether my colleagues want to come in, but there needs to be a big push to bring those capabilities up.

Steve Foxley: I was going to support your points. We are being asked to put secondments into DESNZ and Great British Energy, leading the delivery body for the industrial growth plan. Those conversations are happening.

Q97 **Luke Murphy:** Just on foreign direct investment, what is the scope for improvement in FDI for driving growth within the domestic supply chains for clean energy? Do foreign investors and developers have sufficient insight into the UK manufacturing base for low-carbon energy technologies and projects?

Steve Foxley: This is the chicken-and-egg problem that we have. We do not have a big enough domestic industry to leverage that public-private investment that we see in other sectors. At the same time, we cannot afford to attract industry without significant levels of support. That is where we need learning around from other sectors. How do we attract inward investment? It is around world-leading innovation that they can then utilise. It is also then putting in the necessary incentives around that for them to bring in inward investment. One is the demand signals. The second would be competitive offerings for those companies to manufacture in the UK.

In terms of visibility of UK expertise, that is pretty good. If you look at the developers and the OEMs, they know the areas and the supply chain that we have in the UK that is available.

Dr Hicks: Just to add to that, there are some more specific challenges at a regional level. If you look at investment in start-ups and scale-ups, it is six times higher for those that located in the Oxford-Cambridge-London triangle than in the other regions of the UK. There is a visibility and a connectivity issue for some parts of the country, where there may be a role for either local government or central Government to help those organisations to pitch or help to join the dots.

The CBI report that the Chair mentioned earlier also has really interesting information on the amount of FDI already coming into the net zero industry. It is much higher than, for example, UK AI companies. There are links there and it is about growing them out even more.

Pranesh Narayanan: Innovation funding is one area where we could try to make a policy change to leverage some of the spending we are already

doing to bring in private investment. Right now, the public spending framework for innovation is limited to certain levels of technology readiness. When you get to the end of the year, when you get to the stage of what is considered to be a commercially viable technology, that is no longer eligible for funding from the likes of Innovate UK.

However, at those levels you could potentially fund innovation that directly looks at how you manufacture things at scale as opposed to how you develop technology. That could be one way of doing that.

Q98 **Luke Murphy:** Are there sources of investment or a threshold beyond which FDI for clean energy projects becomes undesirable? For example, China's funding for offshore wind or nuclear projects?

Pranesh Narayanan: I am not sure whether we have hit a critical mass of industry in the UK. If there are security considerations and we are talking about not wanting potential adversaries to own parts of our industry or infrastructure, that is one question. In terms of whether there is enough FDI, I do not think there is. We need more FDI. If the concern is that there is too much, it is not helpful to think about it as too much. It is more about whether this is a security issue, for example.

Q99 **Luke Murphy:** I take your point on the level, but at the point where there might be a level, do we even have a framework in place for understanding how we trade off national security and energy security with domestic supply consideration?

Dr Hicks: We have the National Security and Investment Act 2021, which was passed under the previous Parliament. There is a question as to whether that is fit for the future. I do not have a specific view; I just know the Act exists.

Q100 **Luke Murphy:** Should there be a differentiated approach towards greenfield and brownfield types of FDI within the UK for low-carbon energy projects?

Pranesh Narayanan: This is not an area I am a massive expert on, but my understanding is that both are desirable. On the one hand, greenfield FDI for new factories is desirable in the situations where that is necessary, as is brownfield FDI to perhaps have an advanced multinational company come in and bring their expertise into an existing facility and invest in that. That is also very beneficial where those existing facilities exist. It should be a case-by-case consideration rather than having a framework around that.

Q101 **Chair:** Is the capitalisation of GB Energy and the way the national wealth fund is now structured an attraction and a de-risking, potentially, for foreign direct investment? Have you seen any evidence? Do you think from your research that it is likely to make it more likely that we will see increases in private investment generally?

Steve Foxley: From my side, it is a bit too early to tell. We have had initial conversations with GB Energy. They are establishing themselves. We are working out areas where we can collaborate. How can we identify companies that we think are going be important for the future that could be invested in, with GB Energy and the national wealth fund to support that? Where do we see technologies where innovation funding is required not only from a security perspective, but in terms of export markets? It is also about helping GB Energy with technical assessment of opportunities that they can get behind. It is too early to say, but there are some good conversations starting.

Dr Hicks: I would agree with that. It is also an important point that they should be structured in a way that crowds in private investment rather than crowding it out. That is something that the Government should keep an eye on.

Q102 **Chair:** Do you think they have been?

Dr Hicks: It is too early to say at this point. There is not enough detail.

Pranesh Narayanan: The issue is that, for example, the national wealth fund was the UK Infrastructure Bank, and so the mandate it had was different from what the national wealth fund is going to end up having.

Q103 **Chair:** Can you just say what you understand that difference to be?

Pranesh Narayanan: The UK Infrastructure Bank was quite focused on infrastructure. The national wealth fund has scope to take stakes in businesses and in manufacturing facilities. There is a slight difference in emphasis of the kinds of investment it will be making. As I said, the organisation itself is going through some flux, so it is hard to tell.

Torcuil Crichton: Grangemouth would be the living example of that.

Pranesh Narayanan: I am not too familiar with that example, sorry.

Chair: May I thank you all again, Steve Foxley, Marie-Laure Hicks and Pranesh Narayanan, for your evidence and time this afternoon? It was very helpful. You all have additional contributions to make in writing, so please do so over a period of time. With that, we will end the session.