OFFICIAL REPORT
AITHISG OIFIGEIL

Economy, Energy and Fair Work Committee

Tuesday 19 January 2021

Session 5

The Scottish Parliament
Pàrlamaid na h-Alba

© Parliamentary copyright. Scottish Parliamentary Corporate Body

Information on the Scottish Parliament's copyright policy can be found on the website - www.parliament.scot or by contacting Public Information on 0131 348 5000

Tuesday 19 January 2021

CONTENTS

ECONOMY, ENERGY AND FAIR WORK COMMITTEE

2nd Meeting 2021, Session 5

CONVENER

*Gordon Lindhurst (Lothian) (Con)

DEPUTY CONVENER

*Willie Coffey (Kilmarnock and Irvine Valley) (SNP)

COMMITTEE MEMBERS

*Colin Beattie (Midlothian North and Musselburgh) (SNP)
*Maurice Golden (West Scotland) (Con)
*Richard Lyle (Uddingston and Bellshill) (SNP)
*Gordon MacDonald (Edinburgh Pentlands) (SNP)
Alex Rowley (Mid Scotland and Fife) (Lab)
*Graham Simpson (Central Scotland) (Con)
Andy Wightman (Lothian) (Ind)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Julian Leslie (National Grid ESO)
Steven McMahon (Ofgem)
Sam Peacock (SSE)
Chris Stark (Climate Change Committee)
Morag Watson (Scottish Renewables)
Charles Wood (Energy UK)

CLERK TO THE COMMITTEE

Alison Walker

LOCATION

Virtual Meeting

Scottish Parliament

Economy, Energy and Fair Work Committee

Tuesday 19 January 2021

[The Convener opened the meeting at 09:10]

Decision on Taking Business in Private

The Convener (Gordon Lindhurst): Good morning and welcome to the second meeting in 2021 of the Economy, Energy and Fair Work Committee. Apologies have been received from Andy Wightman.

The first item on the agenda is a decision on whether to take item 4 in private. Does the committee agree to do that?

Members *indicated agreement.*

Climate Change Plan

09:10

The Convener: Item 2 is on the climate change plan. We have three witnesses. Morag Watson is director of policy at Scottish Renewables, Sam Peacock is director of corporate affairs and strategy at SSE, and Charles Wood is head of new energy services and heat at Energy UK. I welcome you, all three.

I ask that when a question is put to you, you allow a few seconds for broadcasting staff to turn on your microphone, rather than doing what is natural, which is to come straight in. We have limited time this morning for questions and answers, and there are quite a few questions from committee members, so I ask witnesses to keep their answers short, sharp and to the point, and not to feel that they need to answer every question by every committee member. However, we will see how the discussion develops.

Graham Simpson (Central Scotland) (Con): Good morning. I will start by asking about targets. Recent figures show that 19 per cent of energy consumption—through electricity, heat and transport—in 2017 came from renewables. That rose to 21 per cent in 2018. If we were to keep to that trajectory, that would lead to our achieving 45 per cent of all energy consumption coming from renewables by 2030. What needs to happen to achieve the 2030 target of 50 per cent? Does the draft climate change plan set out the right actions, and what should be included in the revised energy strategy?

Morag Watson (Scottish Renewables): I can start with that, convener, if that is helpful.

The Convener: Yes, certainly.

Morag Watson: I will take Graham Simpson's questions in reverse order.

We consider the climate change action plan update to be a very credible suite of actions that need to be taken in order to meet our climate change targets, and we welcome its content. However, we caveat that by saying that a degree of detail is missing from it; we do not yet have a detailed action plan for how things would roll out.

On Graham Simpson's second question, we are very much focused on electricity. At the moment, 90 per cent of Scotland's electricity comes from renewable sources. We expect that the figure will be 100 per cent when the next figures come out.

Our next big horizon will be on heat. To date, we have not hit our targets on heat; we should be at 11 per cent, but we are at only 6.5 per cent. The things that are in the climate change action plan,

the bill on district heat networks—the Heat Networks (Scotland) Bill—that is going through Parliament, and the developing heat pump sector deal will certainly be a step change. To date, low-carbon heat has been a somewhat neglected area of policy, but it is very much coming to the fore. We expect that we will hit our targets on that over the next 10 years, if we put all the actions into practice.

The Convener: Sam Peacock wants to come in. He has put an R in the chat box, which is the best and easiest way for us to keep track of who is coming in and out of the discussion.

09:15

Sam Peacock (SSE): Good morning. Thank you for having us.

My first point is that it is good that we have the target; it is good to have something that the industry can look to so that businesses can line up projects and supply chains and move in the right direction.

From the developer perspective on renewables, four obstacles stand in our way. I will not talk in micro detail about any of them. The first relates to planning. At the moment, it takes too long to get a wind farm out there and delivering power—on average, it takes 11 years for an offshore wind farm to get to that point. We might talk later about the planning framework.

Secondly, we need grid connections. A lot of work is going on with the United Kingdom Government on how we co-ordinate offshore grids so that we do not just have the point-to-point connections that we have had. That needs to work and to be done on time.

The third obstacle relates to grid charging, which sounds techie and a bit boring, but is very important. At the moment, the Office of Gas and Electricity Markets uses a very complicated methodology for charging wind farms for use of the grid. At the moment, it is heavily skewed towards southern projects and away from Scottish projects, for which the cost in energy terms has a premium of about £3 per megawatt hour Compare that with UK projects, in which we expect an overall project to come in at about £40 per megawatt hour. That is a significant premium that is slowing things down. If we do not get a bit of movement on that, we might continue in the world in which Scottish projects do not win the auctions. Only SSE's Seagreen project won, last time.

Those are some of the issues that we should start to look at.

Graham Simpson: That is useful.

Charles Wood (Energy UK): Thank you convener, and those who are attending the meeting.

Graham Simpson asks a good question. It is challenging to go beyond changing to low-carbon power to ensuring that transport, heat and everything else use low-carbon energy. The other two witnesses gave great answers, but the customer end of things was not touched on as much as I would have liked.

Heat decarbonisation is critical, and we need to continue to accelerate decarbonisation of transport, in the form of use of electric vehicles. That means that there are new end-user assets that we need to use more smartly. We need to figure out how to use those assets so that we get the most out of existing assets and future generation capacity that is yet to be built.

Smart use of technologies and storage at various levels of the energy network will help us to increase the amount of renewable energy that we can actively use at any time. Our members already provide a lot of services that allow us to do that; for example, time-of-use tariffs match people's use with local low-carbon generation.

I want to flag up that the customer end is also important.

Graham Simpson: Those were useful answers.

Charles Wood touched on transport—[*Interruption*.] I am sorry. Convener?

The Convener: I think that there was a slight glitch with my information technology. Did you have a question on transport?

Graham Simpson: Yes. I was just about to ask it. Is that okay?

The Convener: Yes—but please be brief.

Graham Simpson: Charles Wood mentioned transport, on which we have not made a great deal of progress. Emissions from transport have not really fallen. That is the next big challenge. Do the witnesses have anything to say about what needs to happen in that regard?

We can think of the issue at an individual level. Most of us are still driving around in petrol or diesel cars, if we are lucky enough to have a car. We travel on buses and trains that are, in most cases, not electric. What needs to happen? It seems to me that we need to be quite ambitious.

Perhaps Charles Wood can answer first, given that he mentioned transport.

Charles Wood: That is a useful question. At this point, transport is intricately linked with energy. It is no longer a separate field—it is

merging into the electricity and low-carbon gas sectors.

I caution against the hesitancy that Graham Simpson seems to express in respect of how much ambition we have shown and how much progress we have made. We absolutely have made progress—there has been clear progress through the introduction of 2030 targets, for example. There is charging infrastructure across Scotland, and in various other parts of the UK, which is reducing people's anxiety about how far they can get with an electric vehicle and about whether such vehicles meet their needs. Electric vehicles have increasing and expanded capability. People driving them now have a better experience and will share that experience through word of mouth. That will increase as people see the 2030 target looming.

Increasingly, we will see public use of transport changing; that is included in the plan. Many businesses will use their next cycle of vehicle purchasing to buy electric vehicles. After five years they will put those vehicles on the second-hand market, in which there will be an increase in the numbers of people purchasing them.

We have to wait for things to tick along, but the ambition, speed of movement and rate of change are more impressive than one might think, and the trajectory of increasing speed and capability will continue over the years.

Sam Peacock: From the committee's perspective, the thing to watch for is the next price-control process for the distribution networks—the regional networks that take electricity to people's homes and to businesses. We need the electricity networks to be in great shape to enable more EV charging and more electrification of heat, which we have been talking about.

We have been asking for a regulatory regime that allows a lot of consultation of local authorities and of people who know what is happening on the ground. We need to enable investment ahead of need in the network, so that we have a good electricity network sitting there into which we can easily plug a charging methodology. I think that that area will be of real interest to the committee over the next year, as plans start to form.

The Convener: We currently have 740MW of offshore wind capacity planned or being installed in Scottish waters. Is it realistic to expect that capacity to increase so significantly by 2030, to between 8GW and 11GW? Is the Scottish Government's contribution to achieving net zero emissions in Scotland sufficient? What do the witnesses have to say about that?

Sam Peacock: The ambition exists—we just have to get everything pulling in the right direction. One question for SSE has been whether the next stage of the work should involve a delivery plan to monitor progress as we go along. With a net zero delivery plan that is updated each year, we would be able to see whether projects were coming through at the pace of change that we need.

On the specific question about renewables, I think that we can get there. With the ScotWind leasing process, and if we can find a way of getting the grid-charging methodology changed so that Scottish projects are not penalised and do not carry a cost premium in comparison with UK projects, there is, from our perspective, absolutely nothing stopping us from delivering what we need to deliver on offshore wind. It is a huge opportunity for Scotland, and a bunch of companies, including SSE, are prepared to invest in it. The policy framework is pretty good—we now have to align planning, the grid and charging so that all the elements point in the same direction. At present, that is not quite happening.

The Convener: I think that we lost Morag Watson briefly. I asked whether it is realistic to expect the increase from 740MW to 8GW to 11GW in offshore wind generation by 2030 that we are looking for. Does Charles Wood want to come in on that point, or does Morag have any comment on how realistic that goal is?

Charles Wood: I direct you to Morag.

The Convener: Perhaps Morag can come in.

Morag Watson: I apologise, convener. My internet connection dropped off for a second, but I am back with you.

The targets for offshore wind in Scottish waters are realistic. The industry has looked carefully at them to ensure that we are confident that we can meet them.

Colleagues have touched on the two main issues. One is consent and permission to do things as quickly as possible. The 11-year timeframe for offshore would makes meeting targets challenging, if we cannot receive consent. The other issue is problems with the offshore grid. Grid connections and planning permission are the two major bumps in the road that we will need to get over in order to put more generation in the system. That is doable, but things will need to change, in terms of policy, grid charging and consenting.

Maurice Golden (West Scotland) (Con): I am interested in transmission and distribution networks. Recently, the Scottish transmission owners produced business plans. I would like to hear the panel's thoughts on the impacts of those business plans on security and supply, and on costs to consumers. Could we start with Sam Peacock?

Sam Peacock: Absolutely. That is a great question. The transmission business plans were designed with the Scottish net zero targets in mind. Transmission is kind of like motorways for electricity in the north of Scotland.

There is an ambitious plan to match Scotland's renewables ambition. I think that we have, with the Office of Gas and Electricity Markets, got to a place where the next price control should be on track. However, because of the length of time that some developments take, we already have to start looking ahead to the next business plan, which will be starting in four or five years. That will be the real crunch plan for getting some ScotWind renewables projects connected. We think that we are on the right path with the current business plan for the north of Scotland, but we are already working on the next one, which I think might be even more important for Scotland's renewables objectives.

The only other thing that I would say is that price controls for the distribution network—which is made up of, let us say, the smaller roads that deliver electricity to people's homes—are really important. The heat and transport debate is important, so we need to make sure that this year's business plans are fit for purpose and match the climate change ambitions. We are working very hard on that and hope that we will have something to share with people in June, when we submit our plan. I will be happy to get that out to members, so that they can see it.

Maurice Golden: Can you comment on the specific point about costs for consumers?

Sam Peacock: I will need to look at the costs for transmission. I will come back to the committee if I am wrong on this. It is a very small part of the bill; I think that with the previous price-control measure we added £7 to the bill, although I am grasping in the back of my memory for that. There will be costs involved with achieving net zero emissions. One of the big debates is about how we ensure that the costs are allocated fairly, so that people who cannot afford to pay them are protected. Work on the just transition is important; there is a bill to pay for all the stuff that we want to do to tackle climate change, but we need to make sure that paying that bill is spread fairly across society. I think that that is at the heart of the question.

Maurice Golden: I have a brief follow-up question about how transmission costs are allocated to consumers. Is it the case that those who are further away pay more of the costs? How are the costs apportioned?

09:30

Sam Peacock: It is a hideously complicated system, and people in Ofgem have made quite an industry out of it. There is some protection for the north of Scotland network, which comes from something called the hydro benefit. Because that network is more expensive to run, consumers and generators there are protected from some costs—there is a kind of cushion that takes away some of the costs. However, there is a case for doing more on that. A person's postcode should not determine the particular costs that they pay.

We have always been of the view that consumers across the country should have some sort of flat payment. If we are building more renewables in Scotland to help to power parts of Scotland and the rest of the UK, there is a commonsense argument that that is a social good that those Scottish consumers are contributing towards. There is definitely room for reform in that hideously complicated area—I probably have not done it justice—to make it a bit fairer and more even-handed, particularly for consumers in the north of Scotland.

Morag Watson: To pick up on Sam Peacock's point, one of the industry's key concerns about the networks is that Ofgem was not set up to operate in a net zero world; its remit is clear and is to minimise costs for consumers. We all support that, but now we need to minimise costs for consumers in a net zero context, which is quite different. We consider it untenable to suggest that we can go towards our net zero targets without some change in how regulation happens.

On the transmission network, our old system was set up really sensibly with a locational charge, which was to encourage generators to put the generation as close to the users as possible so that we had the minimum amount of grid infrastructure at the least cost. When we used hydrocarbons and we could move the fuel around to the generating centre, that was perfectly sensible, but now we need to put the generation where the resource is, and most of it is in the north-east of Scotland while the bulk of the consumers are in the south.

We have been looking at that issue. Along with our colleagues at RenewableUK, we have been working closely on it with Ofgem. However, as Sam Peacock alluded to, the system is unbelievably complicated even for Keith Bell, who works on the issue for the Climate Change Committee as one of Chris Stark's team. Unpicking the issue will take time. We are looking to the Scottish Government and the Scottish Parliament to keep up the pressure and say that something needs to change. A solution needs to be found to protect consumers and get the generation that we need. However, we are not

convinced that as much time is being given to that as should be given to it.

Maurice Golden: As you have highlighted, it is sometimes helpful if politicians do not get involved in the highly complicated and technical charging regime, although they often like to do so. Does anyone else want to comment?

The Convener: Charles Wood can come in briefly before we move on to the next questions.

Charles Wood: On the point that the industry would not want politicians to get involved in highly complex charging regimes, we would not want you to get involved to the extent of needing you to read up on it and understand it perfectly, but we absolutely want you to continue to push for a just and fair transition and an appropriate apportioning of the costs of the transition. You should keep up that voice and keep the momentum going, and we will deal with the detail where we can. Please keep the pressure on.

Gordon MacDonald (Edinburgh Pentlands) (SNP): I will continue the questions on security of supply. The updated climate change plan has been described as ambitious and welcome. I think that Morag Watson said that it was a credible suite of actions. However, not everything is in the gift of the Scottish Government. This morning, I have heard that areas of concern include planning and connection charges. The UK Government is responsible for ensuring that there are favourable market conditions and incentives to support investment in infrastructure. Are there any issues that you have not touched on that we must look at in order to ensure that we get the necessary investment, so that all planned renewables can connect to the network and we can have security of supply?

Sam Peacock: That is a great question. If I was to think about what we want to achieve in energy, in terms of which plates are spinning and which are not, the renewables plate is spinning, subject to the points that we have mentioned. In that area, it feels as though we are in a really good place—we need to sort some stuff out, but we are okay and in a decent place. The price controls for the electricity networks plate seems to be spinning, too—getting the price controls for the electricity networks right should not be beyond the wit of man.

I think that the bit where it gets trickier is in making sure that the flexible plant that keeps on the lights when the wind is not blowing is zero carbon. There are two routes—I would say this, because SSE is interested in these areas—through which we see a lot of potential in that regard. One is carbon capture and storage, which we might come to later. We also see strong potential for decarbonising Peterhead power station, which has been running hard to keep on the lights at important times when we really need it. However, at some point, that needs to be decarbonised, and we have serious plans for how we could do that. That plate is moving slightly; it is certainly not spinning. We have not got in place the proper support mechanism from the UK Government; there is still some way to go on that.

The other flexibility plate that is not spinning is the batteries or pumped storage plate. We consider that—the plan was great on this—there is huge potential in Scotland for pumped-storage hydro. Across the UK, that can really be done only in Scotland. In effect, the way in which the technology works is to have a hydro dam and, at times of low demand and low electricity prices, to pump water up the dam so that it can then be used when you need to generate electricity. That plate is not spinning at all.

We have a great project that could bring great jobs to Scotland. Other developers have other projects, too. However, we do not have in place the policy foundations for something that could contribute a hell of a lot to Scotland's security of supply.

Gordon MacDonald: Are any reasons coming from the UK Government why, to use your analogy, the plates are not spinning?

Sam Peacock: It would probably—

Gordon MacDonald: Is it to do with the UK Government's spending on nuclear, for example?

Sam Peacock: The UK Government seems to be obsessed with that very expensive technology for some reason.

I think that the UK Government would argue that the carbon capture plate is beginning to spin—it has set up the beginnings of a policy framework for that, and we are trying to hold it to account for its delivery.

On pumped-storage hydro, I honestly do not know. We have been talking for a while about how that infrastructure could contribute in the way that interconnectors do. Pumped-storage hydro needs a support system framework that is similar to that for interconnectors. It does not need a whole bunch of subsidies; it just needs a way of making sure that its revenues are stable, which is basic regulatory practice.

We have been trying to get on people's radars, but maybe we have not been good enough at doing that. The potential for pumped-storage hydro is huge. There is a gap, and it is a bit odd that the UK Government has not helped to drive it forward, to be perfectly honest.

Gordon MacDonald: Does Morag Watson or Charles Wood want to come in?

Morag Watson: I reiterate Sam Peacock's point about pumped-storage hydro—keeping the reliability of supply and having storage on the network is an essential part of the mix. More storage projects will come forward, which is something that the Scottish planning system has not had to deal with to a great extent so far. Provision will need to be built into the new national planning framework 4 to allow more storage to be put on the grid. That will be essential.

At the moment, our electricity system is very centralised. We can think of it as a tree, with transmission as the trunk and distribution as the branches. However, it is very clear, and clearly acknowledged, that the system will not be like that in the future. That is something else that will need to happen. We will have local energy systems—we can imagine a honeycomb of interlinked cells—whereby energy generation and use is much more localised but the whole system is connected so that, if one cell goes down, it can draw from the others. The models of how that will work in practice are only just emerging. The Scottish Government has been supportive of the work that is happening in Orkney, where there is a groundbreaking project to demonstrate how it might be done, with generation, use and storage all integrated in one big system.

Another important issue, which we have not touched on yet, is hydrogen. Hydrogen is not an energy in and of itself; it is an energy vector. It is a way of storing and moving energy quite effectively. We were pleased to see the Scottish Government's report "Scottish Hydrogen Assessment" and its hydrogen policy statement, which came out before Christmas, and we look forward to seeing the action plan. It is a huge opportunity for Scotland and, with our abundant renewable energy sources, Scotland really could be a powerhouse when it comes to green hydrogen. That will be very important in advancing our systems. We want the potential that is in those documents to be realised, as it will be of huge benefit to our country.

Charles Wood: I will keep my answer short, as I will probably reiterate points that Morag Watson and Sam Peacock made. The UK Government might not yet be spinning the plates, but it is sorting the plates out, at least, so we must await publications over the next few months that will give more direction. That is no reason for Scotland to wait for the UK in relation to the many areas on which Scotland could go faster, as Morag and Sam pointed out.

Gordon MacDonald: Given that, in 2019, Scotland exported 28 per cent of its electricity south of the border, and given that the UK depends on the European Union for up to 15 per cent of its supply, how urgent is it that the issues that we have been talking about are dealt with so that supply is secured in the context of Brexit?

Charles Wood: It is very important that those issues are resolved. A wide range of flexible technologies can offer a solution. Pumped hydro, which has been mentioned, is a fantastic technology in Scotland and has a lot of potential applications. There is potentially a case for further interconnectors alongside other technologies that increase system flexibility. Such approaches take time, but we can offer the reassurance that we do not expect there to be an issue right now; we are very much in a state in which system balancing is effective and we are not afraid of things going wrong. However, there absolutely is a case for investing in those technologies now so that, in five or 10 years' time, we can still give you that guarantee of security of supply.

Graham Simpson: Sam Peacock mentioned pumped-storage hydro. Did you have a particular project in mind?

Sam Peacock: Yes. I will put my cards on the table. We have Coire Glas, in the great glen, which is a fantastic project. It could provide 200 times the induced storage capacity of the world's largest battery at the moment. Other developers will have other projects; I do not want to pretend that we are the only people in the world who are trying to develop such a project. Coire Glas could make a serious contribution to Scottish security of supply in the world post unabated fossil fuels.

Graham Simpson: Has that project been identified, or is work on-going?

Sam Peacock: We have a consent. It is sitting there, ready to go. We are waiting for some sort of revenue stabilisation mechanism, such as the one that exists for interconnectors, that would give a cap and a floor for the revenue. It is not beyond the wit of man to design something. There are things that could be taken off the shelf and tweaked by the Government or by Ofgem. We do need that, as the risk of building it would be too high if there were no policy certainty.

09:45

Colin Beattie (Midlothian North and Musselburgh) (SNP): I have heard about a variety of possible projects that might move all of that forward. What major infrastructure improvements would be needed to support the supply chain?

Morag Watson: I am sorry for the pause—I could not type R in the chat box quickly enough.

That is an important question. Scottish Renewables pays a great deal of attention to the supply chain. The key factor that underpins a robust supply chain is having a pipeline of projects

coming forward predictably and steadily. That is what businesses need in order to be able to invest.

We have spoken at length to the UK Government about the fiscal mechanisms for both onshore and offshore renewables to ensure that that happens. Unfortunately, there has been a stop-start approach to those matters in the past, which is not beneficial for business. We need a predictable pipeline.

If we look around the world, we see a great deal of money that is looking for investment opportunities. Renewable energy, especially in Scotland, is regarded as a good investment. We have no shortage of projects or of financial backers who are interested in them. The supportive policy context that we need to give those investors confidence is being put in place, but there is still work to do. Once those financial mechanisms are sorted out, we expect to see many more projects come forward in round four of the contracts for difference process, which will happen later this year. That is when we expect to see real change.

Sam Peacock: Morag has put that fantastically well. It is happening. You can see SSE's projects this year, such as the Seagreen project in the Firth of Forth and our Viking wind farm in Shetland. We are creating 1,000 jobs on those projects this year. Some stuff is happening.

Probably 50 per cent of the content of the Seagreen offshore wind farm will come from the UK. We all want to get the final 50 per cent, but to do that we need strategic investment in things such as factories to make the blades and the towers. Companies such as mine will do our best to get that final part of the jigsaw in place, but funding from the UK and Scottish Governments, which would help us to establish factories, is critical to topping up the final part of that.

Colin Beattie: That leads me neatly to my next question, which is about jobs. We hear that thousands of jobs will be created here, there and everywhere. Analysis by National Grid, the University of Strathclyde and ORE Catapult indicates that more than 60,000 new jobs could be created. That is a lot of jobs. Are those estimates credible and achievable?

Sam Peacock: I would have to look at the detail. I know that we measure our own work. We get PricewaterhouseCoopers to carry out an audit every year that works out our contribution and the jobs that we generate, both directly and indirectly. That is done in a credible way. The number that we have says that SSE contributed to 10,500 direct and indirect jobs in Scotland last year. I can give the figures to the committee. I think that the figure will be even higher this year as a result of what we have been talking about and the projects that we have started.

However, for me, capturing those jobs in Scotland and the UK is the key feature for the offshore industry over the next 10 years. We have started quite well, but we have more to do. We need to get some of those batches for critical components. SSE is trying to make that happen, but it will take companies and the Government working together.

Charles Wood: The core thing is that, although it is very difficult for us to pinpoint exactly how many jobs are going to be in exactly what parts of the sector, there is an estimate that the utilities sector as a whole will be looking for something like 270,000 jobs in the next 10 years. A fair proportion of those will be in Scotland, and the way in which those can be taken is based completely on what Scotland's approach will be.

The climate change plan seems to put Scotland in a very good place not only for offshore wind jobs but also for those that are in the supply chain for other elements. For example, the manufacturing supply chain for low-carbon heat is of high potential for Scotland.

Again, we need to help people to recover from Covid, as the lockdown has prevented installers of all the different new technologies from getting into people's homes. We also need to help people to move into a sustainable sector, through reskilling and retraining. The energy industry is currently looking at that in a lot of detail in order to figure out how many jobs we need and by what date.

The incremental targets that Scotland is setting are very helpful. However, we need to see more detail, following the plan, of how we are going to achieve the dates and incremental targets that you would like to see in the next five or 10 years, so that we can plan for that and ramp up the supply chain of skilled workers.

While I have your attention, I will mention a pumped hydro facility at Cruachan—sorry for my pronunciation if that was terrible—in Argyll, which is currently looking to expand. That would mean around 200 jobs for the next six years and the enabling of around £500,000 in investment. However, it cannot currently do that. I note that facility as an example of a pumped hydro storage facility that currently needs a bit more clarity on planning and a bit more support from central Government. I wanted to answer two questions there.

Colin Beattie: Over the years, we have heard a lot of estimates of how many jobs the so-called green revolution will result in. In 2018, the low-carbon electricity sector directly supported 7,800 full-time-equivalent jobs across Scotland. Given the projections now, that number will increase

exponentially. I asked whether that is credible. To touch on a point that has just been made, there is the question of skills and training. Where are the gaps on skills and training in the electricity industry when it comes to achieving net zero? How are they being addressed?

The Convener: Does Morag Watson want to come in on that?

Morag Watson: Absolutely. I appear to have lost you all from my screen, but I will talk to a blank screen and hope to get you back soon.

Skills and skills transition are really important. On jobs, I go back to my previous point about a pipeline of projects. The projects generate the jobs. Without them, the job numbers would stay the same and the number of people who are employed would not expand in the way that we want.

On skills specifically, we are currently leading work with the Energy Skills Alliance. We are looking at the number and types of jobs that there will be in the energy industry in 2021 and mapping those against the likely requirements to 2030 and beyond. The work is high level, but it is necessary so that we equip Scotland with the world-class further and higher education systems that will be needed in order to bring forward the right number of people with the right qualifications to go into the jobs that we expect.

The other work that we are doing is through the Offshore Wind Industry Council, which is a UK-level body, and the Scottish Offshore Wind Energy Council, which is a Scotland-specific body. Both have skills workstreams to ensure that the companies that work in the offshore sector and in the supply chain have access to the skills that they need now and will need in the future. The bodies work with the supply chain companies to ensure that the skills are delivered ahead of need so that we are not running to catch ourselves up.

We recently did a study of 18 to 34-year-olds in the UK to see whether they want jobs in those kinds of industries, and we found that 45 per cent said that they see the sustainable sectors as offering the most secure career and that 6 per cent specifically want a job in the fossil fuel industry. That is a much lower percentage than we have seen previously.

The Scottish Government is doing a lot with its science, technology, engineering and mathematics strategy and the STEM hub partnerships, which are a mechanism that is helping to address the skills gaps that we will have. We have called for a renewable energy skills centre of excellence to ensure that we match up the coming demand with supply.

Skills training is therefore an active area of work for all of us at the moment. We pay a great deal of attention to it because the industry will need the skills and we want to see more jobs in Scotland. The key priority in the industry at the moment is matching those two areas up to find a productive way forward.

Colin Beattie: Where are the gaps at the moment? Where are the pressures on resources and skills?

Morag Watson: I will pass that question over to Sam Peacock because he is much more involved in the employment end of the sector, and he can tell you about the kind of skills that he is looking for as a developer.

Sam Peacock: That is a great question. To date, we have managed to fill the gaps. There are some fantastic stories about people whom we have managed to get from the oil and gas sector in Scotland who have useful infrastructure skills that have enabled them to convert into working in the renewables sector.

To date, we have been quite effective at getting those people, but I am a bit worried about the situation. The workforce in SSE who have been doing a lot of the work to date is an older one. Although we have seen some younger people coming through, that is not quite at the pace that I would like to see, given that we are trying to build an industry for multiple decades.

Having thought and talked about the issue, I think that the most useful thing from a political perspective will be anything that the Scottish Government can do to help with retraining programmes and skilling up in partnership with industry. That will be critical going forward. We have not had a huge crunch point and we have been able to get people to date but, given the scale of the 11GW, which we talked about earlier, we will run out of people pretty quickly. Having the ability to train people so that we do not end up having to go abroad for skills would be fantastic.

Colin Beattie: On the Scottish Government and the initiatives that it should take, what more could it do? It is already doing a great deal, as has been said, through STEM and other initiatives on which it is focusing to bring people on. What more could it do compared with what it is doing now? What is it not doing?

Sam Peacock: From my perspective, I would not be hugely critical of the Scottish Government in that area. We need to do more in areas such as planning and grid charging, because we are not there yet. The Scottish Government has made serious efforts to help to move the skills aspect forward. It should keep going and do more of that, but focus in particular on helping with retraining initiatives for people coming from the oil and gas

sector. That has already started, and I will not pretend that I am the first person to refer to that aspect. However, more Scottish Government focus on that retraining would help, because Scotland has a world-leading offshore oil and gas industry, and we want to keep building a world-leading renewables industry. My view is that that is where some of the low-hanging fruit on training and skills is.

The Convener: Thank you. I am conscious of the time, and I want to allow another couple of committee members at least to put their questions. We will go to Richard Lyle now.

Richard Lyle (Uddingston and Bellshill) (SNP): Good morning, panel. It seems to take years to set up various projects from start to finish. In relation to planning, what improvements should be made to and what efficiencies should be found in the consenting process to enable faster determination of applications? What are the risks in making applications more efficient and speeding them up?

10:00

Morag Watson: Our biggest issue with planning is the time that it takes to get consent and the unpredictability. Since the climate emergency was declared, the number of renewable projects that have been consented to has gone down rather than up. In many cases, it is pretty much 50:50 as to whether consent is granted.

When the Scottish Government put out its call for ideas for national planning framework 4, we spent a year working on that. The policy response was the most comprehensive that we have ever done. It extends to one major document and six supporting documents that explain exactly how we can improve the planning system. I will not take up the committee's time by going through all that, but we can certainly provide it.

The key things that we need include consistency. The way in which planning policy is applied across authorities in Scotland varies widely, and that brings great unpredictability. We also need more efficiency. As I said, we are at about 50:50. That means that a huge amount of work is done in the planning system that does not result in projects going forward. That is not a great use of anybody's resources.

The other thing that we need is more capacity. What we have seen during the current situation in particular is that staff in local authorities and people in the Scottish Government have been pulled on to other things, so paperwork has sat on people's desks for literally weeks on end. We have spoken about how renewable energy projects can contribute to a green economic recovery, but that cannot happen if they are stuck on somebody's desk.

Through our manifesto and other channels, we have raised with the Scottish Government the fact that more capacity will be needed, particularly given the levels of deployment that we will need in future. More and more applications will come forward in a system that is already struggling to cope with current capacity, and that is a really big area of concern for our industry.

Richard Lyle: I totally agree with every comment that you have made. What will be the impact of the NPF4 delay?

Morag Watson: Again, that is something that we are deeply concerned about. We fully understand the impact of the current pandemic situation, and we absolutely support the Government's need to put some work on hold. However, the length of delay in NPF4 is a concern for us; it will not be in place until 2022. We would like to see that accelerated or interim policies put in place between now and then to support renewables coming forward.

There are two areas of concern. When we have the contract for difference auctions—there will be one this year and one in two years' time—people must have their consents fully in place before they can bid in them. However, the pace at which turbine technology changes is huge. If we think of the pace at which mobile phone technology is changing, that gives us an idea of how quickly things move forward.

If someone received consent three years ago, it is likely that, by the time they come to build the project, the turbines that were specified in the planning application will no longer be available on the market and a newer model will be being put in place. In some cases, the planning authority will see that as a non-material change and it will get consent very quickly but, in other cases, it will be seen as a material change and the authority will want to reconsent the project, which will slow it down.

We have spoken to the Scottish Government about that at length. Currently, planning is not designed to keep up with the pace of technological change, which will only accelerate. That is not just in relation to wind turbines; it is in relation to heat, transport and so on. We need a system that can keep up with that.

Richard Lyle: I ask Sam Peacock and/or Charles Wood to comment quickly on my last question. Should NPF4 make climate change and achieving net zero emissions material considerations in the planning process? I agree that the process must be speeded up.

Sam Peacock: I agree with everything that Morag Watson said. She put all of that far better than I could. I also agree with Mr Lyle's fundamental premise.

I understand why NPF4 is delayed, but anything that could be done to speed it up would be absolutely brilliant. In the meantime—this may be wishful thinking—if we could get some direction for the key planning decision makers so that we can have more of a presumption in favour of renewable-related development, given the race against time to get some of those projects in for auction, that would be fantastic.

One issue that Morag Watson did not touch on, although its importance was implied by some of her comments, is the repowering of onshore wind. In many cases, we will need to do quite a bit of tinkering with sites to get newer turbines on them. Obviously, that has to work for communities—that is a given—but it would be good if we had a fluent and relatively rapid planning process. However, as a developer, I suppose that I would say that.

Charles Wood: I echo what the previous speakers have said. Richard Lyle is completely right to raise the issue. The climate change plan update has helped to pull together a lot of different policy and regulation levers in order to best accelerate the transition to net zero emissions. I agree that ensuring that planning is seen through the lens of whether it helps us to achieve net zero is critical.

Richard Lyle: You have a supporter here. I am retiring in May, but I will support you as much as I can.

Willie Coffey (Kilmarnock and Irvine Valley) (SNP): Good morning to the panel. I ask for a few words about negative emissions technologies. Sam Peacock started to talk about those earlier on. For the benefit of people who are watching this, will you say what is meant by negative emissions technologies and where they fit in the climate change plan?

Sam Peacock: On where they fit, we do not have them at the moment. All the things that we have talked about so far are zero emissions technologies, such as renewables. Even things that we think are absolutely critical to the system, such as carbon capture and storage and our plans at Peterhead—I should have said earlier that we think we can do them by the mid-2020s if we are given a fair run; we could get them moving pretty quickly—have some residual emissions. Carbon capture and storage has a small amount of residual emissions. For our electricity systems to be purely negative, we will need to use things such as biomass—the carbon is captured and taken out of it—or some sort of biofuel instead of fossil fuels, or we will need to do something around direct air capture. This is stretching my knowledge, but that involves taking carbon dioxide out of the air and turning it into something else. That is clearly not my specialist subject, as members can tell.

We are not moving fast enough on those technologies. Charles Wood knows more about that area than I do. We have focused on zero emissions technologies or very small emissions technologies as a company, but I know that others in the sector are looking further at negative emissions technologies.

Charles Wood: On the technologies that already exist, the focus is on capturing carbon that is in the air currently or capturing carbon that is produced as part of a process. On biomass in particular, there is a plant run by Drax that operates a small carbon capture technology to pull in some of that carbon. The next 12 to 24 months are critical for the development of those technologies, so it is welcome to see the emerging energy technologies fund of £180 million and the carbon capture and utilisation challenge fund from 2022. They will be critical in supporting the industry, pushing things forward a little, and getting them past the technology-readiness level at which they can be pushed out at scale.

In the Scottish journey towards net zero, negative emissions technologies will absolutely be part of the mix. Exactly what the mix of technologies and options will be is uncertain—it could involve everything from planting trees and restoring peatlands to putting carbon capture in various parts of cities to capture directly from the air. The next two years in particular, along with the funding that has been announced, will be critical to pushing that forward.

Willie Coffey: Is it realistic to expect the technologies to be planned, developed and operational by 2029? That is only eight years away, and we have kind of lost a year because of Covid. We have set ourselves the huge target of, I think, a 376 per cent reduction by 2032. Is it realistic that we will get there in that timescale?

Charles Wood: That question is increasingly difficult to answer, because the ability to get there depends on how much money we spend. How quickly we can move on decarbonisation depends on how much money we are willing to spend. If we create the right market frameworks and state that carbon capture technologies will be of value in 2029, the industry will meet that—we will invest in research and development and in those technologies, and we will deliver that. The timescale is ambitious, but we simply do not have any choice.

Willie Coffey: What about balancing the risks and the benefits between Government, industry

and consumers? Are we clear about who does what, who gets what, and who contributes what? Are we clear about that framework?

Charles Wood: Not in the slightest. A lot of questions are being asked right now, and central Governments are looking at who should pay and how the net zero transition will be funded. That is very much a series of questions, potential options and ways that the process could work. The Scottish Government is actually doing very well in that area, as it has the clear consumer engagement plan that was published with the climate change plan. There is a need to consistently get consumers on side and to get them to understand the purpose and the societal and economic benefits of decarbonisation.

Many of the things that will answer that question will come from existing workstreams. We have talked about network charging and a few of the complex things that are happening that will help us to answer the question. It is important for the plan to be examined repeatedly and for that question to be asked repeatedly. Energy UK thinks that the committee should have a role in that. The Scottish Government should be held to account for whether it is delivering and whether it has answered the questions and is supporting consumers who need that support to transition. At least yearly—I hope that it will be twice a year—the committee should ask those questions to find out how much progress has been made. The committee should regularly ask those core questions about how the Government will protect consumers from bearing the brunt of the costs of transition.

Willie Coffey: My final query is probably for Morag Watson and Sam Peacock. Does Scotland have the capability to compete in the sector? We know that there is good expertise in the technologies in Denmark and Norway. Are we well placed to compete and deliver a successful industry in the area in Scotland?

Morag Watson: Absolutely—without a doubt. Scotland's renewable energy resource is the best in Europe, and we are exceptionally well placed. We can generate many times more energy than we would ever need to meet our own needs. Germany, the Netherlands and Belgium are already looking to Scotland, as they do not have enough renewable energy resource to power themselves. We have touched on the point that the expertise from the oil and gas industry in the North Sea is world class. If you can engineer energy projects in the northern North Sea with the conditions that it throws at you, you can do it anywhere in the world.

We are seeing that all the skills in subsea engineering, moorings, pipelines and the handling of gas are transferable. Our members are already working on energy projects on every continent in the world, with the exception of Antarctica. They are working in 72 countries. There is a standing joke that, if you go to any foreign project in China, you will always hear a Scottish accent somewhere on the site.

10:15

Scotland is extremely well placed. We will always say that more needs to be done in policy, but actually the Scottish policy context is among the most supportive in the world. More can be done around planning and all the things that we have talked about, but the short answer to the question is yes, we are extremely well placed to do that.

Willie Coffey: Does Sam Peacock have anything to add to that, or is that enough?

Sam Peacock: I will be brief. Scotland's comparative advantage is huge. I will say one thing that links to a previous question and then I will shut up. If we can get carbon capture and storage going at Peterhead and get carbon capture and storage pipelines going in some other areas in Scotland, we can get other industries to plug in. If those anchor projects underpin a carbon dioxide pipeline, it will be much easier to get other industries to start taking their emissions out and plugging into that pipeline. In theory, if we get that sort of thing going by the middle of the decade, the comment that you made about 2029 will start to look a bit better.

Willie Coffey: Okay. Thank you very much.

The Convener: I thank our panel of witnesses very much. If you want to add to any of the comments that you have made or if you have further information on any of the issues that have been raised, please feel free to write to the committee.

I bring this evidence session to a close and suspend the meeting until 10.25.

10:16

Meeting suspended.

10:25

On resuming—

The Convener: I welcome our second panel of witnesses on the consideration of the climate change plan: Chris Stark, chief executive of the Climate Change Committee; Julian Leslie, head of networks and chief engineer, National Grid ESO; and Steven McMahon, deputy director for electricity distribution and cross-sector policy, Ofgem.

Thank you for joining us today. Please give it a few seconds before answering questions, to allow our broadcasting colleagues to bring you in. Do not feel that you need to answer every question. We might not be able to get to all the points that you would like to cover, given the time limitations, but please feel free to write to us after the meeting if there are points that you would have liked to make or if you have further information that is helpful to the committee.

Graham Simpson: You will have heard the questions that we asked the previous panel. My first question is broadly similar to that which I asked at the start of the meeting and relates to the level of energy consumed that needs to come from renewables. What needs to happen to achieve the 2030 target of 50 per cent of all energy consumption coming from renewables?

In the interests of speed, I will throw in another question that you can answer at the same time. What proportion of the energy system should be in local or community ownership? By that, I am referring to district heating. The committee has been dealing with the Heat Networks (Scotland) Bill, and the question is pertinent to that.

Chris Stark (Climate Change Committee): Good morning, everyone, and thank you for inviting me to speak to the committee this morning. I have a few comments to make on renewable capacity and the question of what can be achieved. The Scottish Government should be congratulated on its ambition in that regard. It is great that Scotland has shown consistent support for renewables for the past 10 to 15 years. That has made a difference across the UK.

The CCC makes regular assessments of the kind of energy system we need across the UK for the net zero world that we are committed to in Scotland—and for the UK. We see renewable electricity as the backbone of the whole energy system. It is a particular benefit as we electrify the economy, because we can clean up the supply by using renewable electricity. In our latest UK-wide recommendations, in our central pathway, we say that, by 2050, 80 per cent of total electricity generation should be from renewables. That is complemented by various things so that there is a workable system.

To deliver that ambition of 50 per cent of total energy from renewables, we are going to have to grow the install base of renewables supply in the UK and Scotland. The Crown Estate has already leased sea bed rights for enough offshore wind to achieve the UK Government's commitment of 40GW by 2030. We have enough space for offshore wind to supply that increase. We also have space for lots of onshore wind in Scotland. That is all very important, because we predict that the demand for electricity will grow significantly.

10:30

However, it is about more than just needing increased generation capacity, which is the key point that I want to make in my answer. As well as growing that capacity, we need to do a set of other of things to the wider energy system. We need to strengthen the networks, particularly the electricity networks, to accommodate all the new demand for heat and transport. We will also need increased flexibility in the way that we use that electricity, so that we can increasingly accommodate the cheap variable renewable supply that we will have for heat and transport, including, potentially, things such as hydrogen electrolysis as a means of storing energy from renewables.

Going back to your question, our recommendation is that the Scottish Government consider the whole system, which it appears to have done in the climate change plan. Therefore, the 50 per cent target will be met by more than just growing the number of wind farms in Scotland and in Scottish waters. We also need to think about the wider energy system and how it is used.

The Convener: Julian Leslie is next.

Julian Leslie (National Grid ESO): It is great to be here—thank you for the invitation.

The decarbonisation of heat is going to require a host of solutions, depending on the locality in which the housing is situated and the networks that are available to it. Whole-sector co-ordination will be needed to pull that together to ensure that all options are kept on the table, not just electricity and decarbonised gas solutions. All those solutions will be relevant and important, depending on the particular housing stock and its location.

On the transmission system, we have more than a doubling of contracts with new generation that is due to connect between now and 2030, increasing the 12GW of transmission-connected generation that we have in Scotland today to well over 20GW in the next 10 years, with the relevant transmission network that goes along with that.

We can see that developers have made contractual commitments in securing those projects. They still need to go through the planning

and contract for difference processes, but the ambition and the plans are there, and the developers are taking those projects forward to make that all achievable by 2030.

Steven McMahon (Ofgem): Thanks for inviting me here today.

I echo the points that Chris Stark and Julian Leslie have made. Looking back over the past decade, it is clear that significant progress has been made in Scotland, particularly through the decarbonisation of the power sector and on the amount of energy that is coming from renewable and low-carbon sources. There is quite a big challenge ahead if you are going to meet the targets for offshore wind. Ofgem is looking at how we get the networks and the co-ordination between offshore and onshore generation so that the grids can accommodate that. On the decarbonisation of heat, we are looking at the range of possibilities for using hydrogen and other resources.

Lastly, picking up on the flexibility point, we recognise that we will probably move to a more disaggregated and decentralised energy system. There will be growing amounts of local generation that will connect directly to the distribution grids. Ofgem is looking at how to ensure that we maximise the opportunities that that affords us and keep costs lower overall. Those are the key issues from an Ofgem perspective.

Graham Simpson: I will pick up on Steven McMahon's comment on local generation, because that was the second part of my question. How can we boost the number of local projects?

Steven McMahon: We can do that in a range of ways. Through our regulation, we can ensure that we have the right investment in place, capacity in the right places to allow that to happen and the right incentives. We can look at the potential opportunities afforded to network operators to keep their overall costs low. There are opportunities. Over the past few years, in particular, the networks have been successful in that regard, and there is a strong platform to build on. These things offer massive opportunities. Engagement with stakeholders is a key aspect. I lead Ofgem's work on electricity distribution grids. There will be lots of local options, and ensuring that the right processes are in place for those opportunities to be maximised is critical.

Graham Simpson: I have another follow-up question. I represent Central Scotland, which includes Grangemouth, of which you will be aware. Grangemouth town does not have a district heating scheme. Given that it is next to a massive refinery, that seems almost absurd, but the issue is the cost of putting one in.

What needs to be done? Does Government need to take the lead to get district heating schemes into existing communities? It is a lot easier to put them in new places, but it is very expensive and difficult to put them into existing communities.

Steven McMahon: The decarbonisation of heat is a big challenge. Some of the potential costs involved, and the consumer impact trade-offs, are pretty significant. We want to work with the Government and other stakeholders to look at the range of technologies, including district heating schemes and alternatives, to ensure that there is a real opportunity for the potential to be realised.

Chris Stark: I firmly agree with the premise of Graham Simpson's question. A place such as Grangemouth, which produces a lot of waste industrial heat, is exactly where we would want a district heating network to be constructed, because that heat could be used to heat the town very efficiently. However, a set of factors has made that difficult.

One factor is that, over time, we have not had in place the kind of regulatory system that would allow us to construct a district heating network easily, as we have been able to construct the gas networks. Another factor is that gas is a very cheap source of heat—as a fuel, it is the cheapest among all the options. That has therefore been the direction of policy, which is helpful in respect of fuel poverty but not for decarbonisation.

As we think about the future, we have to construct a different set of incentives to make the alternatives cheaper. In a place such as Grangemouth, it is absolutely right that we should put the pipes in the ground to allow a district heating network to be constructed—such networks are to be found in many towns and cities on the continent—so that cheap decarbonised heat will be available in the town. That requires a bit of co-ordination at the Scottish Government end, as there are a lot of planning concerns and the process needs to be well worked through.

Changes in policy are also needed at the UK level, including, notably, a potential change in the tax rates that are applied to various sources of energy across fossil fuels and the alternatives.

Graham Simpson: I will not ask another question now, but I would be interested in getting a few more thoughts on what I have described regarding Grangemouth. The situation is enormously frustrating for Falkirk Council, as similar situations have been for other councils. There is fuel poverty in the town, which sits next to a facility that produces a lot of waste heat, and it seems absurd that we cannot do anything with that heat.

Chris Stark does not need to respond in detail now, but perhaps he could get back to the committee with his thoughts on what needs to happen to get the project started. People want it to happen, but there are barriers in the way.

I will leave it there, convener.

The Convener: I will ask a few questions. The witnesses have talked about a great ambition. I think that we all agree that positive ambition is a good thing, but I wonder how realistic—[*Inaudible*.]

At present, 740MW of offshore wind capacity is being planned or installed. Is it realistic to expect that capacity to increase so significantly, to between 8GW and 11GW, by 2030? The UK Climate Change Committee has recommended that the Scottish Government calculates how much

"renewable and low-carbon electricity generation will be required to meet net-zero in Scotland and contribute cost-effectively to net-zero".

The draft climate change plan, or CCP, anticipates the development of between 11GW and 16GW of capacity within its lifetime. Has the Scottish Government committed to that, and is the funding and the planning in the works in order to meet such expectations, which are ambitious, as you have said?

Secondly, what installed capacity of renewable energy are Ofgem and National Grid planning for? Steve McMahon has already touched on decarbonising heating and transport, so the question of how much increased electricity capacity from renewable energy Ofgem and National Grid are planning for is perhaps one for him.

Julian Leslie: As I said earlier, there is huge ambition from the marketplace to drive the connections out to 2030. We already have more than 7GW of offshore wind signed up and ready to go, with plans by the transmission owner and developer in place to facilitate that.

We are also looking to work on an offshore co-ordinated integrated solution, which will drive down costs for consumers and will hopefully accelerate the delivery of the integrated offshore. We are working closely with the Department for Business, Energy and Industrial Strategy and Ofgem on the regulatory and regime requirements for facilitating that integrated offshore solution.

Achieving 11GW by 2030 is ambitious. There is a lot to do, and there is regulatory change to be made, as well as all the planning, the funding and the mechanisms that are required to make that happen. From where we sit today, we are absolutely planning for the connections that are there already, and we are planning for the future to meet both the Scottish Government's ambition and the UK Government's ambition of 40GW by 2030. We have the plans in place, and the recent price controls have given a bit of certainty to the transmission owners that the investment that they require is there and the mechanisms to access the funding are also there, enabling the future grid that we need in order to get us to 2030.

Steven McMahon: We plan on the basis of the climate change ambitions that are set out by the Government, as Julian Leslie described. We use a range of scenarios and pathways to deliver the targets, and we account for the uncertainty in our systems and processes. We recognise that, across the UK, the targets that have been set for offshore wind in particular will require a step change in how offshore generation and transmission are planned, developed and connected. Having those systems in place allows us to build on the success that has been achieved so far.

Increasing the capacity that is required to deliver net zero while meeting our statutory objective of keeping the cost to consumers as low as possible is an on-going process. We work with the Government, industry and other stakeholders to ensure that we have the right regulatory approaches in place to allow an expansion at lowest cost.

Chris Stark: Returning to the earlier question, we recommended that the Scottish Government set out a new assessment of how much renewables capacity would be required to achieve net zero Scotland by 2045. The plan does that, and it is certainly ambitious. The growth that is being projected over the next 10 years is achievable, although it is certainly at the upper end of what I think will come through.

The scope is there to grow the installed base of offshore wind hugely. Even if we just consider what has already been leased and what could be leased in Scotland and across the UK, there is so much scope there. I have one little factoid for you: we reckon that less than 1 per cent of the sea bed will be used by offshore wind in order to meet the 2030 target that the Prime Minister has set. There is plenty of scope there.

The bigger challenge is what we do alongside that growth in capacity for offshore wind. There is scope to do things quickly among the developer community, as long as the policy is there to support that. From my perspective, the Scottish Government's ambition is great, and it is in line with what we think would be needed to get to net zero for Scotland, but there are still big gaps in how it would be delivered in practice. It is therefore a shared issue for the Scottish ministers and ministers in Whitehall.

10:45

We need energy consenting and Scotland's national planning framework to be well aligned. The new national planning framework has been delayed until the autumn. That is a few months of delay, which can make a big difference to some of these projects.

We also need the UK Government to ensure that market mechanisms are in place for the developer community to be rewarded for the investments that it needs to make. The blueprint for that can be seen in the recent UK energy white paper, but there are a lot of consultations happening in this area. The contracts for difference consultation is taking place, and the next round of CFD auctions are to be done later this year.

There are still a few things to be put in place, but I must say that this is one of the better and more fully formed bits of the Scottish Government's plan, so I have fairly strong confidence that it will come through.

Maurice Golden: I am interested in witnesses' thoughts on transmission and distribution. Chris Stark already highlighted that issue earlier. Scottish TOs have published business plans, and I am interested in the panel's view on security of supply as well as cost to the consumer. In an earlier evidence session, we heard that the potential cost to the consumer is less than £10—it is approximately £7—annually. I am also keen to hear the panel's thoughts on consumer cost and key priorities for investment.

Julian Leslie: We all take security of supply very seriously. The ESO looks Great Britain-wide in conjunction with the two Scottish transmission owners. In 2015-16, we did an initial report that considered Scotland's security post-nuclear closure and with a massive increase in renewables. The Scottish TOs needed to make some investment at that point, and that is coming on stream as we speak to bolster security in Scotland.

We are considering that analysis again—as we always do, because we keep things constantly under review—and are also now considering the back end of this decade, from 2025 to 2030, to ensure that nothing has changed with that process and that we are secure. That work will be completed towards the end of March this year, and it will give us a clear blueprint about security of supply in 2030.

Alongside that, we need new tools on the system to operate safely and securely; that includes things such as our stability pathfinder for grid stability and inertia. As we lose the big, rotating mass of machines, we need to replace those services with other techniques. We are running a Scotland-specific process now and should be contracting it to new technology providers by this summer, to be delivered in 2023 or 2024, to get those new services and technologies on the system that will provide us with a stable grid system consistently, even in very low or high wind conditions.

The way that analysing and attracting that investment works is that there are two tiers to the business plans. We put in what the transmission owners know in conjunction with the system operator and we also run the network options assessment process, which is an annual review of what is the right investment at the right time.

As we go through the next few years and start going through the business plan, we will already be identifying activities that need to happen in RIIO-4 and RIIO-5, which are the next price controls following the one that has just been agreed. It takes 10-plus years to build some of those big transmission assets, and we are therefore planning now for the early 2030s. The 2020s network is already designed and the business plan that the TOs have has funding in place to deliver it.

Maurice Golden: I have a quick follow-up. In Scotland, we have TOs and the mechanism for working is slightly different from that in the rest of the UK. Previously, when I worked for Ofgem, there was a system operator and transmission owner incentive working group, to ensure efficient working between SOs and TOs. How efficient can you be in Scotland in improving grid connections and distribution?

Julian Leslie: The regime changed one and half years ago. We are now legally separate from any transmission owner, and the relationship between the system operator and all the TOs across Britain is the same. The mechanisms and the processes that we have in place with the TOs are identical across Britain. The roles that we play as a system operator are to join that together, look strategically, make sure that the actions in one TO do not adversely affect another, get them to work together and get all three or four parties working consistently and clearly to drive the best value for the consumer. The network options assessment process does that—it ensures that any investment that is made by any of the TOs for the big boundary transfer capabilities is done at the right time in the right way and is joined up with all the other investment plans that are happening across the network.

Maurice Golden: That is helpful.

Steven McMahon: This relates to RIIO and the price controls for the electricity transmission system. Last December, we confirmed the spending plans for the price controls. Those will

come into effect quite soon, in April. I think that about £5 billion-worth of up-front investment for the Scottish TOs is included in that. That money is for projects about which we are fairly certain of the scope and cost of the works that are needed.

The other big dynamic that is new with this new set of price controls is the availability of more funding, as and when required, for some of the big strategic projects that can support net zero over time. There are mechanisms in place that allow them to be delivered through the pipeline process, as and when they are required, and in a way that reflects how things are changing in the wider energy system.

At the heart of that, we have been absolutely clear that that should give the network operators the resources that they need to deliver net zero, to support the new demands that are being placed on the grid and to maintain high levels of reliability and security of supply.

Obviously, the day-to-day management of security of supply is a responsibility for Julian Leslie and the system operator, but we make sure that the regulatory arrangements are in place.

On the consumer impact, I think that, broadly speaking, we are saying that, through the RIIO-2 period for transmission, we will support more investment for the same cost to consumers in terms of the impact on their bills. There is a bit of variation in terms of where the costs are realised but, by and large, RIIO-2 will give more investment to support net zero at the same cost. We have been able to do that by pushing down on the operating and financing costs for the network companies, in line with current market conditions, while allowing the additional investment that will be required.

On the distribution side—these are the price controls on which I lead—the new prices will start two years later in April 2023. We set out our methodology for that and the approach to strategic investment just before Christmas. We will get the company draft spending plans from the summer, and there is a process through which we will set in place the arrangements.

Again, our approach will be agile. The challenges of net zero and decarbonisation in the distribution side are significant, particularly from a transport and heat perspective. Therefore, we must ensure that we have the right arrangements in place for those controls.

Maurice Golden: I have a quick follow-up. In the earlier session, we heard consternation about the charging regime and, in particular, about the cost reflectivity of that. Clearly, if you are generating further up north, you pay more, because that is reflective of the costs that you are imposing on the system. Given the net zero requirement and the fact that we as a United Kingdom would like to expand in more remote areas, do you have any reflections on whether Ofgem should look at the transmission network use of system—TNUOS—and the charging regime?

Steven McMahon: I heard the earlier session. Obviously, charging reform is a key part of Ofgem's programme. I think that there will always be areas of disagreement, but we are always open and transparent, and we have a robust process in place through consultations and industry engagement to make sure that we can consider the views of a wide range of stakeholders and reflect that in our approach.

Transmission charging is not my area of expertise. However, I think that the key point is that the two sides are equal and opposite, so it is a zero-sum game—that is, one side pays more, and the other pays less; that is the balance between generators and consumers.

Ultimately, we are looking to incentivise for a smarter, more cost-effective use of the system from those who connect to it, including the generators and energy-intensive users. We want renewable generators to connect to the grid where there is spare capacity, which avoids us having to build expensive extra-grid capacity that might not be needed and enables us to make best use of the asset that we already have available.

It is about fairness and the efficiency of the system overall. If we do not follow that path, we end up with a substantially more expensive system cost, which is not a good outcome for consumers in terms of the way in which those charges are recovered.

Chris Stark: The shape of the energy system that we sketched out in our most recent assessments of net zero is clear and rests largely on the progressive electrification of the economy and the cleaning up of the supply of that electricity over time. The big point with regard to security supply and the consumer is that we will need to grow, not just the supply—I made that point earlier—but the demand for electricity, especially through electrified heat and transport.

By mid-century, we expect that demand for electricity across the UK will at least double. When the CCC considers that challenge, the rule of thumb is that we should try to use variable renewables whenever we can—offshore wind, some onshore wind and lots of solar—because they are the cheapest form of generation. That electricity system is of course different from the one that we have now.

If we want to keep consumer costs low, the key thing is to match the supply with the demand and to minimise the amount of network reinforcements.

Overall, we see that goal as perfectly achievable, but it rests on the idea of making best use of the grid and, crucially, on having a much more flexible source of demand. That point is critical. We get that from a greater use of heat pumps—a nice match for when offshore wind is available—and of electric vehicles, especially if charged with an off-peak tariff to give the incentive to use off-peak electricity.

In our analysis, four elements make all that work. The first is energy efficiency. We talked a little about demand, which will double, but we also need to think about being as energy efficient as possible. The second is using variable renewables as much a possible—we are up to 80 per cent now of total supply in our central pathway by mid-century, because they are the cheapest option for the provision of that big supply of electricity. The third is our need for firm power; it will not be nuclear power in Scotland in the future, but we have that in our assessment for the GB system.

The final element comprises two things that really matter in terms of security supply. One is dispatchable generation, which of course needs to be decarbonised. That complements variable renewables. I am thinking in particular of gas with carbon capture and storage, which features strongly in the Scottish Government's plan. The other thing is flexibility and storage. That is the fourth element of a workable electricity system in a net zero world.

The cost of the integration of more flexibility and a lot of short and medium-term storage is actually quite low in the grand scheme of things. Despite the fact that that energy system is decarbonised, it is cheap overall if we can build in that flexibility and minimise the amount of network reinforcement that we need to do.

Gordon MacDonald: I continue the earlier discussion with Steven regarding the recent Ofgem changes. We heard from the earlier panel that although there is no shortage of projects or investors, a number of blockages exist in the system, including connection charges and transmission charges. Your targeted charging review document of 30 November 2020 says that

"the cost of operating, maintaining and upgrading the electricity grid will be spread more fairly."

Can Steven McMahon expand on what that means in reality?

Steven McMahon: I will pick up on Morag Watson's point from the previous session; we understand the complexities of the governance arrangements around network charging. They can be difficult to engage with, so we are working closely with stakeholders in Scotland to help them to navigate the complexities. Various forums have been set up to help us to do that.

11:00

The key is fairness in how transmission charges are recovered across the consumer base. They are recovered across the whole of Great Britain; we want to remove distortions between generators, and to consider the overall balance between consumers and generators. This goes back to the point about a zero-sum game. When some people pay less, others have to pay more. Therefore, for us, it is about overall fairness and what delivers the greatest value to consumers while making sure that we achieve our broader ambitions.

A number of specific points have been made about the TCR process. Challenges to that are under way; we will reflect carefully on those that come forward to see whether they impact on decisions that we have taken previously.

Gordon MacDonald: The concern is that consumers who are further from major population centres are charged more for generation that is connected to the grid. You said that the costs of operating, maintaining and upgrading the grid will be spread more fairly, but what impact will that have on Scottish transmission charges and connection charges? Will they reduce if there is a fairer and more equitable charging regime?

Steven McMahon: Yes. If we keep the system costs and charges low, there will be benefits to consumers. There are overall net benefits from the decisions that we have taken.

Gordon MacDonald: Okay. Thank you.

This is for Julian Leslie. Given that the UK regularly imports some of its electricity from the European Union—at times, up to 15 per cent—how robust is the system against fluctuations and interruptions to supply?

Julian Leslie: With regard to energy supply, we have a very diverse mix of energy sources, which includes interconnectors. However, we also have the capacity mechanism, which ensures that there is always enough dispatchable generation to meet whatever scenarios are thrown at us. As we go through the winter, if there is a shortage of supply, there is, through the capacity mechanism contract, enough generation to meet demand on the system. There is always enough dispatchable generation available to meet demand when the wind is low.

Gordon MacDonald: However, in recent years, there have been power cuts south of the border.

Julian Leslie: That is true. There was an incident on 9 August 2019, when there was a fault in the system. In order to protect the whole system, a million consumers were lost for 40 minutes. However, that was a rare and unprecedented event, when two things that we

would not normally expect to happen happened simultaneously. As you might imagine, since 9 August, there have been a lot of actions to ensure that we fully understand what happened on that day, and we have put in place processes with generators to ensure that they always operate in a safe and secure way.

Our network is the most resilient in the world and will continue to be so. We are in good shape for meeting the target, as we look to the future and decarbonise further through the electricity system operators' work on pathfinders, and as we identify new services and products that we will need in order to manage the system as it becomes more renewable and less reliant on fossil fuels.

Our ambition is that we will be able to operate the system at zero carbon by 2025. That is only four years away, but we are making great progress in contracting with service providers and in identifying the technologies that will enable us to operate at zero carbon.

Gordon MacDonald: I have a final question. The revised climate change plan has been welcomed by most witnesses this morning, but it is not all in the gift of the Scottish Government. The UK Government must deal with some things—in particular, favourable market conditions and incentives to support investment. Chris Stark mentioned the need for financial incentives. In relation to the UK Government, what else do we need to examine to get the renewables that we require up and running in Scotland?

Chris Stark: The recently published UK energy white paper contains a package of things that are worth considering. It is another blockbuster strategy document from a Government; it is not only the Scottish Government that has produced massive tomes.

The white paper includes a blueprint for a different set of market mechanisms across the piece to deliver the flexible zero-carbon energy system that we have talked about today. All of that is relevant to the committee's discussion. It must dovetail with the discussion about what needs to happen in Scotland, particularly in relation to energy consenting and the national planning framework. The ambition in the climate change plan update is great, but some projects will need to be developed at breakneck speed.

That all needs to come together so that the market mechanisms are in place for the new contracts for difference for power generation, for hydrogen generation—we have not talked about that; the white paper has a plan for it—and for carbon capture and storage, which will be essential to some ambitions in the Scottish Government's updated climate change plan. That must all be brought together with—[*Inaudible*.]—which projects to give consent to and where they will be located.

That can all be done, but the speed that the Scottish Government wants is pretty ambitious: in a single-digit number of years, commercial projects will need to be developed against the new framework, but we do not yet know what that will look like. The Scottish Government and Whitehall will need to strain the sinews of their relationship to make all that work well and to meet the targets that ministers have set in the Scottish Government's plan.

Colin Beattie: I will ask about a couple of points that are important to me, which the witnesses will have heard if they listened to the previous panel. My first question is fairly straightforward. There are lots of initiatives, projects and so forth, but what major infrastructure improvements are needed to support the supply chain?

Steven McMahon: From the Ofgem perspective, we can look at the big strategic challenges. How do we facilitate growth in offshore wind and ensure proper co-ordination between the offshore and onshore networks? As Sam Peacock said, point-to-point connections need to be massively improved. In the more local distribution grids, how do we set a charging infrastructure and create capacity to support rapid roll-out of electric vehicles without compromising reliability? We are looking at electrification of heat, in some cases. Can we demonstrate that using hydrogen is possible, safe and economically viable?

We face a huge range of system challenges. We must have investment to support growth and the pipeline of projects that might materialise over time, and we must have investment in innovation and in research and development, which sits at the heart of our programmes. For technologies that are a little more uncertain, how can we invest now to test their viability? We have set no limit on funding of that for the next set of price controls. All those things should give stability for the pathways, projects and schemes that come forward, so the supply chain should be able to react to that with companies.

Julian Leslie: The supply chain is driven by certainty—whether it is about planning or a subsidy mechanism. Transmission owners need certainty about funding and needs. Plans are needed to drive that certainty so that people can start to invest now.

As I said earlier, we have 7GW in contracts ready and waiting to go and to be developed, but their being developed will depend on a range of things being in place—planning, subsidies and all the other things. Once those are certain, the supply chain will build and develop, and will create the pipeline in order that it can deliver.

Our work on offshore integrated co-ordination will create the backbone of and the framework within which offshore wind developers can move quickly to develop. That will give certainty so that supply chains can get ready to deliver, which will improve capacity.

Colin Beattie: Does Chris Stark have a view on that?

Chris Stark: In terms of major infrastructure, the story on net zero is littered with challenges, and not just in the energy networks or the energy system.

With regard to what we really need to happen, we have talked a lot about renewables and offshore wind. I am very confident that that can happen. We have seen how well the current set of market models works; market incentives are delivering vast increases in capacity from offshore wind.

We also need a transmission system such as we have talked about, but it needs to be well co-ordinated. At the moment, offshore wind farms are connected to the shore with point-to-point connection. Given the extent of the increase in capacity that will be necessary over the next 25 to 30 years, that is another issue that needs to be tackled. There are, in the energy white paper that I talked about earlier, clues that Whitehall is thinking about that.

We also need reinforcement of distribution networks. That is not just a transmission question; it needs to happen early so that we can facilitate the increase in demand that we think there will be, especially from electric vehicles and, in time, from decarbonised heat use, which is done through electricity.

From our perspective, the major costs in distribution are in digging up the roads—the civils, as the work is known. Planning ahead for a well-reinforced electricity network at local level is, I suggest, a major infrastructure challenge.

Along with that is electric vehicle charging. How rapidly we can grow the installed base for electric cars will be largely dependent on how easy it is to charge them. We need a better model for that that works for people who do not have off-street parking in our towns and cities. That is another infrastructure challenge that is easy to talk about, but hard to get going.

We have a set of industrial challenges that will require infrastructure for carbon capture and storage. Scotland needs to be thinking now about where that infrastructure will be, how it will be paid for and whether the model that is being worked on in Whitehall will work for the Scottish projects. We will need capacity for hydrogen to be generated and used, especially in industry, as an alternative to fossil fuels.

I have saved the best until last. The biggest infrastructure challenge of all is the overall question of how we decarbonise Scotland's heat system and move away from nearly all current use of fossil fuels to something that is fully decarbonised. That will involve a set of things playing out over the next few years. The Scottish Government has, in the climate change plan, been hugely ambitious about how quickly those things can be pulled off.

We will need to construct the district heating networks that we talked about earlier. Hydrogen might have a role when it comes to domestic heat; it certainly has a role for industry. Those networks need to be in place. The other network that needs to work for heat is the electricity network. It needs to be reinforced to be ready for all the uses that we will have for that electricity, so that we can keep Scottish homes, and Scottish buildings more generally, warm in the decarbonised future.

That amounts to an enormous infrastructure programme. We think that it is perfectly achievable, but it is not to be sniffed at. We must plan it carefully. I am looking forward to seeing the Scottish Government's delayed national planning framework for a clue as to how that will all come together.

Colin Beattie: I will move on slightly. One positive aspect of all the initiatives that are dangled in front of us is the potential number of jobs that will be created. Analyses have indicated that upwards of 60,000 new jobs could be created. We have heard estimates before that have not been achieved. Are such estimates credible and achievable? Chris Stark is still on screen. Would you like to respond?

11:15

Chris Stark: Such estimates are eminently achievable. Trying to predict exactly how many jobs are attached to any such transition is a fool's errand, because a huge amount of investment, industrial change and change in employment are involved. The projected growth in employment for all the low-carbon proposals and alternatives that are contained in the CCPU is, however, entirely feasible.

The biggest requirement will probably be in the challenge of decarbonising Scottish buildings. Making buildings more energy efficient tends to be quite labour intensive, so it is sensible to plan for that as we emerge from a deep recession and the economic crisis that has come with the pandemic. That would be a good way of using spare capacity that we currently have in the Scottish economy.

That is a good place to look for where there will be jobs, and there is lots of optimism.

There is a kind of Panglossian approach that says how great things will be, but the fact that some sectors—the oil and gas sector, in particular—will shrink as we go on the decarbonisation journey needs to be seen alongside that. When it comes to employment and skills, all the evidence from standard economics tells us that the best way to retrain someone and move them from one industry to another industry is to do that while they are still employed, and to begin the planning now.

I fully support the jobs outlook in the document; it seems to me to be entirely credible. However, a package of skills and retraining support that facilitates movement of jobs across the economy from high-carbon industries to low-carbon industries will be needed. There is a clue in the draft climate change plan update's accompanying document on skills, but I would like to see more about that; I would like to understand better how the transition will take place. It is unusual in economics that we can predict with some confidence what needs to take place over the coming decades. We should be able to plan well, so that we do not end up in a crisis situation for some of the jobs.

Colin Beattie: I will interpret what you have said. Some of those 60,000 jobs will not be particularly new ones and people will come out of the oil and gas industry and other high-carbon industries and be retrained.

Chris Stark: Yes, I think that that is right. It would be nice to see some guidance on how that will play out, as the Scottish ministers see it.

Colin Beattie: Does Julian Leslie have a view on job creation?

Julian Leslie: As the electricity system operator, National Grid does not employ directly in Scotland. However, I know that the assets and the scale of the investment plans that have just been approved by Ofgem for the Scottish transmission operators require a huge uptick in the capability and deliverability of some very large projects. There will be £9 billion of investment between now and 2030 just for links from Scotland to England. There is a huge amount of investment that will require jobs, skills and skilled labour in order to make things happen. You would need to speak to the Scottish TOs for a more detailed response.

Colin Beattie: Does Steven McMahon have a view on that?

Steven McMahon: Like Julian Leslie, I have no basis from which to refute the numbers that have been posted. The scale of our investment programmes in Scotland—in the transmission network, for example—is significant. We have been clear that a highly skilled and diverse workforce will be needed to deliver them.

The point about new skills is important. We are moving to an increasingly data-based and digitalisation-based economy. There are new technologies that can be exploited; how companies handle them and manage their networks will vary over time. That will bring new opportunities and new requirements.

Overall, I agree with Chris Stark that the numbers that have been set out are not unreasonable.

Colin Beattie: I have a final question that is based on points that have been made. Where are the skills and training gaps in the electricity industry for achieving net zero emissions? How are they being addressed? Are they being addressed adequately?

Steven McMahon: Ofgem makes sure, for all the bits that we control, that relevant companies have in place the right processes to provide a trained and competent workforce, irrespective of the challenges that are faced. I do not have any particular information on skills gaps—I do not come across that issue in my day-to-day work—but it is probably good to look at that in respect of data and digital skills.

Vast opportunities are created by new technologies and new ways of managing the system, and companies are already responding to that. However, the scale of the challenges and the opportunities will increase over time, so companies have to adjust to that.

The Convener: I do not want to cut anyone off but I am conscious of the time and that two further members of the committee would like to pose questions. If the witnesses have anything more to say on those questions, please feel free to write to the committee. Indeed, points might arise in the questions that the next two members will ask that could benefit from comment after the meeting.

Richard Lyle: For the sake of time, I will try to be brief.

Does the UK Government's energy white paper put in place the necessary supporting framework to achieve the draft climate change plan's ambitions? Do the white paper and the draft CCP adequately address the implementation gap, as highlighted by the Environment, Climate Change and Land Reform Committee?

Who wants to volunteer for that one?

Chris Stark: I can go with that. It is a difficult question to answer. The ingredients are in the energy white paper to support the many priorities that are spelled out in the climate change plan

update from Scottish ministers. It is impossible to know whether the market mechanisms will be there to lever in sufficient private investment to deliver such outcomes. That is the secret sauce. We have not really understood how well supported these ambitions will be by the private sector, because most of the investments that will deliver net zero in Scotland, especially in the energy sector, will be private investments. They will rest, in part at least, on the kinds of market mechanisms that are envisaged in the new energy white paper.

All I will say is that it has made a good start. The energy white paper has all the right elements in it. I have mentioned some of them—carbon capture and storage, hydrogen production, and new arrangements for supporting renewables into the future. There is probably enough there that will allow us to construct the kind of investment profile that will deliver the Scottish Government's ambitions.

It is not clear to me that the co-operation exists between the Scottish Government and Westminster that will deliver that. As the real projects are developed, they will need to be supported to benefit from those market arrangements once they are in place; that will require a lot of co-ordination north and south of the border, which has traditionally been much more of a problem when it comes to such projects.

Richard Lyle: Should Ofgem have the explicit statutory objective of supporting the delivery of net zero? What more should Ofgem be doing to support the achievement of net zero? What incentives should be put in place to encourage the flexible use of electricity?

Steven McMahon: I know that that point was raised earlier. We operate under a statutory remit that was set by the UK Government, to protect the consumer now and in the future; I am sure that you have heard that before. That means keeping energy bills as low as possible while making sure that there is enough investment to build a low-carbon energy system for future generations.

We see our statutory duties as very much including the requirement to hit the net zero targets passed by Government, but I do not think that we feel constrained in any way by our current remit to deliver net zero. However, if any further guidance on that were to come from the UK Government, we would welcome it. In the energy white paper, the Government has committed to consulting on an updated strategy and policy statement this year; we will welcome anything that comes from that.

Our forward work programme, which was published just before Christmas, recognises that regulation needs to constantly evolve to make sure that we can keep up with the pace of change that we are seeing and that, for everything for which we are responsible, we can make the necessary changes to reflect what is happening in the market and improve regulation. Anything that clarifies that would be great, but we do not feel constrained at the moment.

The point about flexible use of electricity is important. The potential demand that could come from, for example, the electrification of transport and heat means that we need to make sure that we make best use of the capacity that we already have, particularly through flexibility technologies.

To take a simple example, if we run the system as we are and everyone was to purchase an EV and go home at night—in a post-Covid world—and charge it during the peak evening period, the amount of infrastructure that we would need would undoubtedly bring increased costs for consumers. However, if we can flex when we take power off the system and when we charge our batteries, doing that at different times to make sure that we are making the absolute maximum from those assets, the costs will be more manageable. That is the key point from us.

Richard Lyle: Thank you. The next question is for everyone. I have always championed development and my view is that Scotland must be open for business, not closed. Therefore, what improvements should be made to, and efficiencies found in, the consent process to enable faster determination of planning applications? What are the risks to communities in making those applications more efficient and speeding them up, and what will be the impact on projects of any delay to NPF4?

Chris Stark: I do not have much to say about the experience of the developers. The job that I did before this was in the Scottish Government as the director for energy and climate change. I had responsibility for the advice that ministers received on the energy consents for transmission and for new onshore wind farms. Therefore I have some experience of that—*[Interruption.]* Yes, it was a job I loved.

I can answer on a personal basis that I think the system in Scotland works very well. In particular, that is because the Scottish energy minister looks at the application in the end. That is a really strong part of the Scottish system. I would love to see more community involvement in that process, but in such a way that it does not delay good projects. It is important that we have a system that allows communities to have their say and also allows them to have a stake in those projects, be that the jobs or a share of the revenue from the project.

There has been a history in Scotland of projects taking too long to get through the consenting

process. The lesson of the plan that we have before us from Scottish ministers is that we need to do a lot of things very quickly. In particular, some big commercial projects need to be developed in less than 10 years if we are going to make the targets and meet the objectives in the plan. A good consenting system can support that, but it needs to be really well oiled.

I would like to see preparation now for rapid consenting of some of those projects, particularly the ones that we can eyeball and understand where they will be. We could, perhaps, start the process early. It has always been a vexed and difficult question and we would not want communities to be robbed of the opportunity to comment and have their say. It is easy for me to say that the energy system might need X, but much harder to construct the process for gathering the community's views about the development.

Lastly, I would like to see a much greater focus on the opportunity that comes from jobs on such projects. It would be very helpful if that could be a substantive part of the application process.

Richard Lyle: Yes. I totally agree that if a project gets consent for a planning application here, they have to build it with labour supplied from Scotland.

I have a quick question for Julian Leslie. Can the national grid cope with a sudden explosion of projects?

Julian Leslie: The explosion does not happen that quickly, so we always have time to plan. The relevant remits in terms of connect and manage are in place for new generation; we have the right processes in place to allow the connection and the generation.

We have seen a massive decrease in demand over the past 10 years, following the financial crisis in 2008, and we know that the transmission system is capable of supplying up to 60GW across Britain. The peak demand so far this winter, which has been less with Covid as well, has been only 44GW. Therefore, there is plenty of capacity for supply of demand in the short to medium term and plenty of capacity to facilitate the connection of the rapid increase in offshore and onshore renewable projects over the next 10 years.

Richard Lyle: Thank you.

The Convener: We now have questions from the deputy convener, Willie Coffey.

11:30

Willie Coffey: I have a couple of questions on the negative emission technologies that I mentioned when we were speaking with the first panel. The first question is for Chris Stark. Is it realistic for us to expect to meet the targets that we have given ourselves to provide net reductions, using technologies such as carbon capture and storage, by 2029? I mentioned that earlier. Is that possible, realistically? Where are we on that journey?

I will roll that into the next question, which is for Julian Leslie and Steven McMahon. What is the role for Ofgem and National Grid in taking all of this forward? How do you anticipate assisting both Governments in trying to achieve our aims?

Chris Stark: One of the most notable features of the climate change plan update is the extent of the use of negative emission technologies: there is to be quite a lot of it by 2032. By 2029, as you say, it is to be used commercially at scale.

When we look across the whole of the UK, we see an important role for negative emission technologies. In our most recent assessment we considered how to allocate that technology across the UK, and we thought that between 3 and 9 megatonnes of greenhouse gas removals could be taking place per year via that means.

The headline is that the Scottish Government is to achieve that by 2030. That is pretty tasty, to put it mildly—it is ambitious. Developing that will be a big challenge. The negative emission technologies are being used almost entirely in the electricity sector. We are using biomass, potentially growing trees here in Scotland, and using that in the electricity generating process, capturing the carbon and storing it in the North Sea. That process is entirely feasible, but developing it at the scale that would be required will be a huge challenge.

Thinking about that electricity challenge, we know that Yorkshire has Drax power station, which is set up pretty well for bioenergy with CCS, as it is called. I am not aware of a power plant that is yet in development or in operation in Scotland that could deliver those negative emissions in the Scottish power sector.

To put all that in perspective, a new commercial bioenergy-with-CCS generation plant will need to be developed at a Scottish site. It could be developed at the existing Peterhead site, which currently has gas generation, and it would have to go through a pilot stage, reach financial close and finally be constructed by 2029 to start generating in line with the negative emission technology numbers in the plan.

All that needs to be achieved over quite a difficult period, the first few years of which will be taken up with developing the commercial models for carbon capture and storage and various other things. The Scottish Government has promised to consult on various elements of that, including bioenergy and hydrogen.

Achieving that is feasible, but it will be hugely challenging. My own take, for what it is worth, is that we are seeing the dangers of setting too stringent a target in the short term. We seem to have an artefact from the 2030 emissions target, and it looks like negative emission technologies. The Scottish Government's commitment on decarbonised heat is in the plan to try and make up the numbers. The update document contains a really interesting message from the analysts, that the modelling could not get us to the 2030 target, so we have instead had to allocate the extra emissions across the economy in some form. That is a really interesting thing. It seems that negative emissions have been the release valve.

I would love to see the proposals happen but, if they are to come to fruition, the Scottish Government and officials north and south of the border will need to work hand in glove with Whitehall if we are to get the market models in place and get real projects developed. The lion's share of bioenergy-with-CCS projects would need to be in Scotland, in what is a very competitive field across the UK.

Willie Coffey: I ask Julian Leslie and Steven McMahon for their perspectives. How do we accelerate the process to try to achieve the targets within the timescales that we are talking about? What is the role for Governments in working collaboratively with one another to try to achieve that?

Julian Leslie: From an ESO perspective, the future energy scenarios have negative emission technology at their heart. That is absolutely crucial to decarbonising the harder-to-reach sectors and offsetting the carbon that will still be transmitted in other sectors. Our role is to say that we support the technology, to see how it fits into a credible pathway to 2030 and beyond and then to facilitate the connections and, if it is providing services to the grid, to see whether there are any ancillary services, products or markets that we can participate in to help with the financing. Fundamentally, however, from our perspective, the projects will find their own funding and will need to stand on their own two feet, and we will then facilitate their connection to the grid and get the benefits of doing so.

Willie Coffey: What is Ofgem's role in assisting us to move forward?

Steven McMahon: I agree with Chris Stark and Julian Leslie. The targets in the area are incredibly ambitious, but I do not think that the plan suggests in any way that technologies alone will get Scotland there. There is a deep recognition of some of the harder changes, such as behavioural change and reducing energy consumption where we can. Ofgem's view is that there is probably space for all those technologies. If some of them are not viable, there might be alternatives.

We are engaged in the issue. That is mainly about working with Government to ensure that business and regulatory investment models that support the zero and negative carbon technologies are in place so that we can make sure that our regulation can support their delivery should they materialise.

Willie Coffey: That is helpful. I will leave it at that, given that we are pressed for time.

The Convener: I thank all our witnesses for appearing virtually at the committee today. If you have any further information, please do not hesitate to write to us.

Subordinate Legislation

Financial Assistance for Environmental Purposes (Scotland) Order 2020 (SSI 2020/409)

11:36

The Convener: We move on to agenda item 3. Does any member have any substantive issues to raise about the order, or are we content that it should come into force?

It appears that we are all agreed that the order should come into force.

We move into private session.

11:37

Meeting continued in private until 12:22.

This is the final edition of the *Official Report* of this meeting. It is part of the Scottish Parliament *Official Report* archive and has been sent for legal deposit.

Published in Edinburgh by the Scottish Parliamentary Corporate Body, the Scottish Parliament, Edinburgh, EH99 1SP

All documents are available on
the Scottish Parliament website at:

www.parliament.scot

Information on non-endorsed print suppliers
is available here:

www.parliament.scot/documents

For information on the Scottish Parliament contact
Public Information on:

Telephone: 0131 348 5000
Textphone: 0800 092 7100
Email: sp.info@parliament.scot

The Scottish Parliament
Pàrlamaid na h-Alba