OFFICIAL REPORT
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Environment, Climate Change and Land Reform Committee

Tuesday 2 February 2021

Session 5

The Scottish Parliament
Pàrlamaid na h-Alba

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ENVIRONMENT, CLIMATE CHANGE AND LAND REFORM COMMITTEE
4th Meeting 2021, Session 5

CONVENER

*Gillian Martin (Aberdeenshire East) (SNP)

DEPUTY CONVENER

*Finlay Carson (Galloway and West Dumfries) (Con)

COMMITTEE MEMBERS

*Claudia Beamish (South Scotland) (Lab)
*Angus MacDonald (Falkirk East) (SNP)
*Mark Ruskell (Mid Scotland and Fife) (Green)
*Liz Smith (Mid Scotland and Fife) (Con)
*Stewart Stevenson (Banffshire and Buchan Coast) (SNP)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Professor William Austin (University of St Andrews)
Kathryn Dapré (Sustainable Scotland Network)
Stephen Freeland (Scottish Environmental Services Association)
Iain Gulland (Zero Waste Scotland)
Andrew Midgley (Scottish Environment LINK)
Sarah Moyes (Friends of the Earth Scotland)
Professor Pete Smith (University of Aberdeen)
Chris Stark (Climate Change Committee)
Stephen Young (Scottish Land & Estates)

CLERK TO THE COMMITTEE

Lynn Tullis

LOCATION

Virtual Meeting

Scottish Parliament

Environment, Climate Change and Land Reform Committee

Tuesday 2 February 2021

[The Convener opened the meeting at 08:45]

Climate Change Plan

The Convener (Gillian Martin): Good morning everyone, and welcome to the Environment, Climate Change and Land Reform Committee's fourth meeting in 2021.

Today we will continue with our evidence sessions on the Scottish Government's updated climate change plan. We will hear from two panels of stakeholders and then from the Climate Change Committee.

I welcome our first panel of witnesses: Iain Gulland, executive director and chief executive officer at Zero Waste Scotland; Kathryn Dapré, chair of the Sustainable Scotland Network; Sarah Moyes, plastic and circular economy campaigner at Friends of the Earth Scotland; and Stephen Freeland, policy adviser for the Scottish Environmental Services Association.

We will concentrate our questions on your views of the emissions reductions envelope in the draft plan. I will go around each of you to ask for your thoughts on whether the envelope is appropriate and ambitious and, given that emissions reductions in this area have slowed in the past few years, whether the climate change plan is sufficient. I will come to you in the order that I introduced you, so we will start with Iain Gulland.

Iain Gulland (Zero Waste Scotland): Thank you, convener, for the opportunity to speak today.

I accept that emissions reductions have slowed during the past couple of years, but the ambition is there and it is set out in the climate change plan update. We need to go further and faster in reducing emissions not just from waste but, more important, from the use of materials across the economy, full stop. That is probably the more significant challenge. We are not just thinking about emissions from waste any more. The primary focus has been on what we do with waste and whether we landfill, burn or recycle it, but over the past couple of years in Scotland, the conversation has changed, with people now saying that we need to reduce waste in the first place and seriously think about the embedded carbon impact of the materials that come into our economy, not just from within Scotland but from abroad. In Scotland, 80 per cent of our carbon footprint relates to the extraction, use and waste of materials, half of which come from abroad. That is the bigger challenge now. The plan recognises the need to embed circular economy principles, but that is certainly the challenge that we need to address.

Kathryn Dapré (Sustainable Scotland Network): The Sustainable Scotland Network is delighted with the publication of the climate change plan update, and we appreciate that setting national targets is a challenge, particularly in the current context and given where we have been for the past year.

We broadly agree with the targets. They are certainly ambitious, and some of them are world leading. Our main concern is about how we are going to deliver against those targets. It has been suggested that there is not enough detail in some of the policies and that some of the emissions numbers do not quite stack up. The devil is in the detail, and we would like a little bit more detail about some of the policies and how they can be implemented.

There are a couple of other small but fundamental things that we would like to see in the public sector. The overall ambition is there in the plan and it is relatively clear how Scotland as a whole expects to get to net zero, and there is an expectation that every public sector body will set its own net zero target. However, we do not have the detail on what each public body should include in its net zero target and how that should be measured. Until we have that detail, we will not be able to get there.

We also need further work on offsetting. Although we agree that that should be a last resort and understand that the overall national policy is not to do that, we need to understand what the policy for individual bodies is likely to be, and we need guidance on how to get there.

The overall message is that SSN is supportive. We are here to help, as we have been for well over 20 years. We want to help the public sector to do this. It is hugely ambitious and it is doable, but further work is required.

The Convener: Thank you. My colleague Stewart Stevenson will dig into policy areas with his questions.

Sarah Moyes (Friends of the Earth Scotland): Overall, it is encouraging that the waste sector has seen a reduction of 70 per cent from 1998 to 2018. We are concerned that the emissions envelope for waste in the updated plan has projected emissions for only half of the time period—there are no emissions projections beyond 2026.

We would also like more clarity on how some of the emissions will be calculated. There will be a

shift from landfilling our waste to generating energy from waste by incineration, but it is not clear how those incineration emissions will be calculated. If they come under another section, that is not really a reduction but just a transfer of emissions.

To echo a point that has been made, the climate change plan update talks about the risk that we will offshore our emissions because they are embedded in goods and services that we import from abroad. We must consider that, too.

It is difficult to answer the question fully. We are seeing projected emissions for only half the time period, and no policies are set out for beyond 2025. The plan does not feel nearly ambitious enough, or as ambitious as it needs to be, if we are to move Scotland towards a circular economy.

Stephen Freeland (Scottish Environmental Services Association): We welcome the acknowledgment in the plan that the sector has achieved reductions in the past couple of decades as we have moved away from landfill. As noted, our sector contributes only 4 per cent of Scotland's total emissions.

The emissions reduction envelope is broadly appropriate: it has us on a downward trajectory, which is what we need. Our sector, like all the others in the plan, is aiming to reach net zero by 2045. That is the end goal, and we are clearly included in that.

There might be some uncertainty about our emissions reductions beyond 2025-26. Those reductions will be delivered in two main ways. When the landfill ban kicks in, there will be a significant reduction in waste going to landfill, which will reduce emissions. That is what we are aiming for and I think that we can be assured that emissions will decrease. There will also be efforts to decarbonise the energy from waste sector. That will not be an overnight fix: there will probably be a 10-year horizon before that starts to kick in as we look at carbon capture and storage.

Those emissions reductions will be felt and seen towards the middle to later part of the plan, rather than during the initial period. We are broadly comfortable with what is proposed, and we see ourselves heading towards net zero by 2045.

Stewart Stevenson (Banffshire and Buchan Coast) (SNP): Sarah Moyes referred to the gap in the plans for the period from 2025 to 2030. She answered part of my question, which is whether anything is missing from our plans: she identified a timeline omission.

Are there material policy areas where activities are missing, either up to or after 2025? Are there omissions that we should be concerned about?

Iain Gulland: The quick answer is that, as you know, the Scottish Government made a commitment to produce a route map, to ensure that we hit the targets for 2025 and then look beyond 2025. Zero Waste Scotland is pleased to have started working with the Scottish Government on the route map, which was announced in the programme for government last year. The intention is that the route map will fill in the gaps beyond 2025 by setting out what we need to do beyond hitting the immediate targets.

The focus is, of course, on making sure that we hit those targets and address the policies that are already in place on reducing waste, particularly food waste, on the single-use plastics directive—and action on single-use plastics, full stop—and on increasing recycling. Money has been available to local authorities so that they can invest in recycling performance. Activities to do with reuse and repair are becoming more popular in the private sector as well as in the community sector. A lot still needs to be done, but there are policies that are still very much in play. I cannot overstate the importance of the route map in ensuring that we hit the targets for 2025 and look beyond them.

You asked where the gaps are. We are working with the Government on the deposit return scheme, which is still due for implementation in 2022. Work is going on at United Kingdom level on fiduciary responsibility; we and Government colleagues are working with the UK Government on an approach that will stimulate performance on recycling and, I hope, reuse.

A lot of things are coming down the track, such as a UK plastics tax. All those things are for the near term—the next five years—but, as I said, the route map is probably the key piece of work and will match the ambition that is clear in the climate action plan. The route map is very much about filling the gaps.

Stewart Stevenson: You are saying that we can expect a route map in the near future.

I ask Kathryn Dapré, from the Sustainable Scotland Network, to talk about where the gaps are. Does the 2025 to 2030 lacuna in the plans matter, or do we have time to wait for the new route map?

Kathryn Dapré: From the public sector's perspective, we need clarity sooner rather than later. We look forward to seeing the route map, but public sector organisations and practitioners need absolute clarity on what they should be doing and how, so that they can put in place the methods and processes that will enable them to meet the relevant targets. Where there is ambiguity, different public sector organisations will respond differently and we will end up in a guddle.

As I said, we need to put in place some of the basics around what waste we are measuring and monitoring and how we are doing that, so that we can properly track progress.

In the context of waste and the circular economy, there needs to be work on public sector procurement—we might talk more about that later. If you want us to use less and to support a circular economy, those considerations will need to be built into how we procure, and I do not think that that happens enough at the moment, because we are still very much beholden to issues of cost.

Whatever measures can be put in place by a public body—whether we are talking about a local authority, a national health service board or a further or higher education institution—it is individual behaviour change that will be key in relation to waste, and I am not sure that there is much in the plan about that. We could provide all the recycling facilities in the world; the question is how we ensure that people use them, and use them effectively. If there could be a bit more focus on that over the next few years, we would see a huge difference.

Stewart Stevenson: I think that one of my committee colleagues will develop the point about behaviour change later in our discussion.

Sarah Moyes focused on the five-year gap. Let me put the same question to her. Are there other gaps? I will give one example that I have in my mind. If we are not planning beyond 2025 but we need people with particular skills to address what happens thereafter, will there be people with the skills to address a future that we have not yet planned? Someone who starts university today will only just be leaving in 2024 or 2025. In general, other than those relating to the timetable, where are the gaps?

09:00

Sarah Moyes: It is encouraging to hear that the route map past 2025 is coming, but it is disappointing that, although sections of the climate change plan update include policies that will be in place past 2025, we are still waiting for such policies in relation to waste. The update talks about the need for a rapid transition to a circular economy, but it does not include anything on repair or reuse, both of which are fundamental to a circular economy. That is a big area on which the update fails.

On Stewart Stevenson's point about there being a skills gap, the update states that every 10,000 tonnes of waste equates to one job in incineration but 296 jobs in repair and reuse, so there is a big opportunity, which is not being taken, to create jobs in those areas. Taking that opportunity is fundamental to a green recovery.

The key thing that is missing from the update is a commitment to introduce the circular economy bill. We completely understood why work on that was paused last year due to the Covid-19 pandemic, but we are disappointed that it is not being put back on the table. The bill is a key piece of legislation that would really help us to move towards a circular economy. Without such legislation in place, it does not feel as though there is enough in the climate change plan to help us to do that.

Stewart Stevenson: One of my colleagues will cover infrastructure in subsequent questions, so I am not trying to extract answers on that subject; again, I am asking about the gaps.

I will direct my next question to Stephen Freeland, from the Scottish Environmental Services Association. We have gone through a year of rapid change in practice and policy, which has been promoted by the Covid crisis, in one area of public life. Have any changes come out of the Covid year that we might want to pick up and which tell us that there are better ways of doing things, or have things got worse?

Stephen Freeland: The pandemic has led to a shift in the way in which waste is collected. Local authorities have been inundated with an increase in waste and recycling, given that people are at home. There has been a corresponding significant drop in commercial waste activities, given that businesses have closed. There is considerable pressure on a lot of the commercial sector, which is not getting the recycling that comes from businesses. That is a big concern for us, and we want the plan to address it.

At the moment, a more piecemeal approach is being taken. All the policies in the plan will be very familiar to everyone in the sector, and they are all lumped together in the one section. There is a lot of focus on environmental bads, through policies such as banning plastic straws and increasing the levy on plastic bags.

Post-pandemic, we are looking for more of a jolt to get us back on track towards a circular economy. We want the plan to provide a bit more detail on how we create resilient markets for recycling and a strong domestic reprocessing and remanufacturing sector. One omission or gap relates to energy from waste. That seems to be seen as a bit of a stop gap in our transition to a circular economy, but it should be embedded within the circular economy.

Finlay Carson (Galloway and West Dumfries) (Con): There has been progress on the two policy outcome indicators for waste in the 2018 CCP—on the volume of waste that goes to landfill and the number of landfill sites with gas capture—but both are described as "Not on track" in the 2019

monitoring report. The waste targets for 2025 are not particularly more ambitious than the targets in the 2018 CCP, and we have the worrying statistic that Scotland generated more waste in 2019 than it did in 2018. It is all very well being ambitious, but we need to talk about what is achievable.

On waste infrastructure, the DRS policy was brought in with little idea of how the collected plastic was to be dealt with in Scotland. What key infrastructure and system changes need to happen now to meet the 2025 targets? What changes to waste management in general that are set out in the plan need to be updated to meet the delayed 2025 targets? The important thing is that we are looking to introduce a landfill ban on biodegradable municipal waste.

Iain Gulland: There is quite a lot in that, including a question about what system change needs to happen. We need to bear it in mind that, in 2018, the carbon impact of our waste was at its lowest ever. I am not trying to dodge targets, but the targets that we talk about a lot in Scotland are still tonnage based. A number of years ago, we developed the carbon metric, which has allowed us to recognise the difference in carbon intensity of materials, not just in the household or municipal waste stream but in the commercial waste stream. That has allowed us to target specific waste streams, and particularly food and plastics. Although plastics are not a heavy item, the carbon intensity is high.

That approach has also allowed us to recognise the importance of things such as reuse and repair of products in the municipal waste stream and the commercial waste stream to drive down waste. Ultimately, if we are serious about climate change, we should use the information and evidence that we have to target the right materials. We should continue to do that in our approach in Scotland. We should consider the highly carbon-intensive waste that we really need to take out, rather than have a tonnage-based system.

To reflect on other things in the climate action plan, Sarah Moyes has made interesting points about reuse and repair, but we really need a circular economy that is embedded in all sectors. When we talk about the circular economy and waste, it still feels as if we are very much talking about the waste industry and what happens to products at the end of their life. We need to embed that thinking and approach in all the sectors and industries in Scotland. Real incentives for reuse and repair would come if different sectors began to take a much more holistic view of the circular economy and considered how to embed the reduction of consumption of materials and products, rather than see it as something that the waste people have to think about and pushing it back up the pipe, so to speak.

There is an opportunity for further system change through thinking about the fiscal instruments. I have been in the waste industry for several decades, and I am always envious of the success of the renewables sector, certainly in Scotland. In the early days of renewable energy, fiscal incentives were put in place to level the playing field and lower the cost, and that sector is now better performing on cost and price than the fossil fuel sector. That is the type of system approach that we need to think about in relation to reprocessing materials. We need to consider how to incentivise the secondary market more, and how to introduce a pull factor that will drive greater recycling, reuse and repair. How can we incentivise better outcomes rather than just penalising the bad, which is what we do to an extent now?

We have seen that happen. We have seen the success of renewables, not just in terms of the fiscal instrument but in terms of industry, jobs and employment across the whole economy. We are reaching for more of that benefit in Scotland from the renewables and offshore industries. That is what we want. We want to map that type of success using fiscal instruments and economic opportunity to make it happen here in Scotland. We have that opportunity because we are taking a circular economy approach and strategy, but we need to embed that into all parts of the industry and society.

Finlay Carson: That all sounds fantastic and ambitious and it sounds as though it is the right way forward. However, is it realistic? Will it deliver to meet the 2025 targets? Do we have enough time? We have heard that the circular economy bill has been stuck on the shelf, so is what you are talking about realistic and will it achieve the targets? We are in 2021 now and we are talking about targets for four years' time.

Iain Gulland: Yes. I mean, we need galvanising as soon as possible, but a lot of the opportunities are in front of us and available. We are talking about them. There are parts of industry and industry players that are interested in the circular economy.

We also have the opportunity to galvanise the public sector. It has access to the materials, whether that be in the household stream or the commercial operations that it is involved in. We have the ability to shape what happens to materials in recycling, as well as through procurement. We are about to talk about that. We can shape what we do and we can do that quickly.

The ambition and the policy frameworks that the Government has put in place are set out. We just need to put them into action, but everybody needs to be involved. We cannot just say that the waste guys have to deal with everything and it is up to

them to do something clever or interesting with waste. It has to be embedded much further upstream. We need to consider how we procure things, how we take a systems approach and how we work together in a much more collaborative way. We need to challenge industry to come on board.

Stephen Freeland: What we need for a review of infrastructure is a complete shake-up of the waste collection system. We have 32 local authorities doing 32 different things, with 32 different ways of collecting material and presenting it to markets with different compositions and to different specifications. We need new sorting and treatment infrastructure. If extended producer responsibility is coming along, we will need to extract far more material than we are doing at the moment. At the back end, we have markets demanding a higher quality of material, so the system also needs to be designed for that.

One of the earlier speakers mentioned behaviour change, and that has probably been the hardest point of all this. It is all very well putting in place a system, but people need to put the right material into the right container, because contaminated and low-quality material at the front end is making its way down and causing problems.

A question was also asked about what needs to be done to meet the landfill ban in particular. I will address that quickly. There is no getting away from the fact that Scotland missed the 2021 target, and that has now been pushed back to 2025. I do not think that we are any further forward than we were in 2020. I have not had any discussions with the Scottish Government or the Scottish Environment Protection Agency beyond those that I had in 2019. Obviously, the pandemic has got in the way and there is no getting away from that, but those discussions need to be accelerated quickly to get us back on track.

The bottom line is that, if we cannot send residual waste that cannot be recycled to landfill, the only option for it is to go to energy from waste, which provides a more sustainable, lower-carbon option than landfill. The failing in the system has been in the public procurement process. We cannot rely on the market to deliver such facilities—we need a policy, leadership and positive signals to develop them. The crux of the problem has been in the public procurement process. The big city authorities have the tonnages that allow facilities to be built, but we have a lot of other authorities with residual waste tonnages dotted around the place, and we need a means to aggregate them so that authorities can come together to provide a more attractive prospect for an EFW solution. That is the only way to get out of our current situation and achieve the 2025 landfill ban.

09:15

Sarah Moyes: I will echo some points that have been made. We are concerned that the landfill ban has been delayed to 2025; it should have come into place in January 2021. I know that we will discuss incineration later, but we are worried that the delay will lead to an increase in incineration. We are moving waste from landfill sites to incineration rather than working on reducing waste, which is one of the main things that we need to do.

I speak on behalf of Friends of the Earth Scotland and not a local authority, so I do not have the most knowledge about the infrastructure that is needed, but we need to focus on behaviour change, too. Collections need to be more regular and an increase is needed in bins or the materials that can be collected, but we also rely heavily on behaviour change. There is still a lot of confusion about what people can recycle. Recycling differs in different areas and a more consistent approach is needed.

We must be more transparent about what happens to waste, because there is a lot of distrust about where the waste goes and whether it is really being recycled. We must do a lot of work to win the public back round if we want recycling rates to increase. Let us not forget that the household recycling rate in Scotland is still below 50 per cent, so we are relying a lot on behaviour change to increase that rate.

Kathryn Dapré: I will pick up on points that Stephen Freeland and Iain Gulland made. I emphasise the whole-system approach for the public sector. The issue will not be solved only by the people who deal with waste; it starts with the consumer and must be followed all the way through. We must take the whole-system approach to all aspects of our waste.

As Stephen Freeland said, we need collaboration among our local authorities and other public sector bodies—and I argue that we need collaboration between public sector and private sector organisations—so that we can take a better look at place-based solutions for our waste. That will enable us to build the necessary infrastructure—whether it is for energy from waste or something else.

Such organisations must work together so that we can properly exploit the full waste chain. Everything is done piecemeal at the moment, so we cannot take full advantage of the opportunities.

Mark Ruskell (Mid Scotland and Fife) (Green): A number of witnesses have touched on

incineration, and I want to get more detailed comments. What is Zero Waste Scotland's view on incineration? Does it have a significant benefit? In the next 10 years, how cost effective would bolting carbon capture and storage on to proposed incineration plants be?

Iain Gulland: Zero Waste Scotland's view is that—as people know and as Sarah Moyes touched on—shifting from landfill to incineration is not as beneficial to the environment as people make out. In carbon terms, we need to think about that. Incineration reduces emissions on the waste side of modelling, but it transfers them to the energy side.

A recent report has stated that there is not a huge difference between landfill and energy from waste in terms of carbon emissions. We need to think about that, particularly now that we have a significantly decarbonised electricity and energy grid in Scotland. Energy from waste is a bit of an outlier in terms of what we are doing now. If we are thinking about reducing waste, we will have to do something with our residual waste, and if we are thinking about climate change, we need to start asking serious questions about the role that energy from waste can play.

I am not an expert in carbon capture, but I recognise that the UK Climate Change Committee has set out that it has a role to play, including in energy from waste facilities. Chris Stark will be here later. Some degree of scale will be needed to make that a reality and we are not quite there yet. Stephen Freeland is probably in a better position to understand the financial situation behind that. It is clear that there will be a cost to carbon capture, so that may increase the cost of incineration for the public sector, because increased incineration is the outlook for public sector waste.

The big challenge at the moment is that, if we see the biodegradable landfill ban as being just about shifting waste out of landfill and into incineration, we will lock ourselves into incineration. When carbon capture comes along, the price will be significantly higher and we will lock ourselves out of opportunities in recycling and the circular economy that would be good for the planet, the environment, the economy—in terms of jobs—and social opportunities in Scotland. We will lock ourselves out of those opportunities and into possibly increased costs in the medium to long term. We need to think seriously about that. From the point of view of dealing with waste, there is a role for EFW, but it cannot be something that we sign up to for any length of time, because of the challenges that it will bring.

Mark Ruskell: I will push the question over to Stephen Freeland. Is carbon capture and storage built into the economic case for each of the major proposals for incineration and energy from waste that are currently being developed and going through the planning system in Scotland? What figures are being put into those applications?

Stephen Freeland: We are in the very early days of carbon capture and storage and just at the point of examining its feasibility. Two of our members are involved in it now and others will follow that lead. Viridor has just joined the Carbon Capture and Storage Association, which I think makes it the first EFW member of that association. Another of our member companies, Suez, is working to explore the feasibility of carbon capture and storage within a cluster of industrial sites down on Teesside. It is early days, but it is a very exciting and promising time.

There are two ways to look at improving the performance of energy from waste, which has to be our main focus if we want to be fully decarbonised. We will need a lot of action on energy from waste. The key way to improve its efficiency is to maximise the heat offtake from it. A lot of plants are electricity only because there are no heat outlets. If we have heat outlets and export the heat that is produced along with the electricity, that will increase the efficiency of the plant and the carbon benefit. We should also look at ways to maximise the recycling of outputs from EFW—the incinerator bottom ash and the metals.

Those are two ways to achieve efficiency, but decarbonisation of the EFW sector is a bit longer term. There are two main ways: one is carbon capture and storage and the other is to decarbonise the feedstock that is going into EFW in the first place**.** That means getting the fossil carbon out from the feedstock—getting rid of the plastics, rubber and textiles. Our members who are operating EFW are not solely EFW operators. They operate a broad spectrum and portfolio of facilities. It is in their interests to get plastic out, and many companies have ambitious plastic recycling programmes, with a couple of applications in progress, in order to get fossil carbon out of residual waste. As Iain Gulland mentioned, there is better value in dealing with it as a recycling waste stream while cleaning up the feedstock that is going into EFW.

Mark Ruskell: But there are no plans for CCS at the moment.

Would Sarah Moyes or Kathryn Dapré like to make any brief comments on this point? I know that you have already made some comments, but I do not know whether you wish to follow up on anything else.

Sarah Moyes: I would also echo what Iain Gulland has said. We are locking ourselves into incineration, given the rise in the practice, and out of circular economy opportunities. We are concerned about the risks of incineration and

about the increase in incineration across Scotland. Research that was published by Friends of the Earth Scotland in September last year showed that six new incinerators are due to start operating within the next two to three years. Those alone will have the capacity to burn a further 1 million tonnes of waste in Scotland per year. Another four are in the planning system.

We are concerned that local authorities are just switching from landfill to incineration. What incentive is there for local authorities that have a new incinerator opening to work on reducing waste and on increasing repair and reuse? There is none, because authorities have locked themselves into a contract to supply the incinerator with a set amount of waste for around 20 years—that is the usual contract. It does not feel like that fits with our circular economy objectives.

I think that you heard from previous witnesses that there are many concerns over the timescale for rolling out CCS. It does not seem like it will be a feasible option for incinerators any time soon. By the time it is a feasible option, we should be at the stage of not building any more incinerators anyway.

Kathryn Dapré: I am not an expert in waste and carbon capture, but I will pick up on something that Sarah Moyes has said. These are end-of-pipe solutions, and if we are getting to the stage of incinerating, we have almost failed in what we should be doing in the first place, which is reducing and moving to a circular economy. From a public sector point of view, that is where we would rather be focusing our efforts. We want to do what we can to reduce waste and get the waste to the right place.

Carbon capture and storage is still very much a new, emerging technology, and I do not think that we yet have a viable working example of it. Relying on it too much is a danger, and we need to focus on the things that can have an impact at the front end of the process.

I am representing many members who have not yet had their say on waste, but I can offer to go back to our members, specifically waste management officers in the public sector, to see whether they have any specific views on the matter, which I can provide as written evidence, if that would be helpful.

The Convener: Yes. It is always helpful to get more evidence.

Liz Smith (Mid Scotland and Fife) (Con): I am particularly interested in how you perceive some of the previous evidence that we have received, particularly when it comes to how consistent and coherent the approach is to much of the climate change plan. I direct my questions to Iain Gulland and Sarah Moyes, who have touched on some of their concerns.

First, is sufficient direction being provided so that everybody in the various sectors understands exactly what they are trying to do? Secondly, are there any gaps in the progress that is being made?

Iain Gulland: I will go back to a previous point. More people are much more aware now that the issue is not just about end-of-pipe waste, and that we need to do things further upstream.

I come back to consumption. We can think about territorial emissions and decarbonising the energy grid—we absolutely need to do those things—but the real challenge for us all, not just in Scotland but globally, is consumption. We need to think about extraction of the earth's natural resources and the impact of that on climate change and on biodiversity loss, which is another crisis that we face.

09:30

We all—not just in Scotland, but around the world—accept that we need to do something about that and to start thinking seriously about it. It is not just a waste question; it is for all parts of society—not just people, as consumers, but every part of business and industry. In our work, we engage with a number of businesses and organisations across Scotland, and there is among them growing awareness and recognition that they need to do more than they are currently doing to reduce their energy consumption and invest in renewables.

All that is well played out in the landscape, but reduction of our consumption is not, although some people are talking about it, talked about much and does not have the same profile. As I said, it would be great to see embedded for all sectors in the climate action plan—including renewables, oil and gas, agriculture and transport—the concept of the circular economy and how we can get smarter in our consumption. What materials are we using and how are we deploying them, and how are we thinking about different circular strategies?

We want better infrastructure and we need things such as wind farms, but it is not sustainable for us to use more and more materials that create climate demands and social and economic demands in other parts of the world, so we need to address that. There is a growing global conversation about the circular economy. Scotland is seen as a pioneer and a leader in the field, but we need to embed the concept in every sector.

I have been at the committee previously, and it is great to share and present information and to

talk to members, but we need to be at all the other committees, too, talking about the same challenges.

There is a huge opportunity for us in Scotland, and not just on climate change and the green recovery that we are talking about, but in respect of creation of new jobs, more resilient supply chains and economic and social opportunities. Scotland has led on renewables and in its climate ambitions; we can lead again on how to reduce consumption and make smarter consumption choices—individually and collectively as a country—in a way that can be replicated in other countries around the world. We have the opportunity to do that in Scotland.

My question is this: how do we get conversations started with parts of industry that are challenged by the net zero approach as much as anybody else is?

Liz Smith: Ms Moyes put on the record earlier that she is disappointed that the proposed circular economy bill was shelved and has not come back. Is that a serious problem with regard to providing greater consistency in, and understanding of, what we need to do across sectors to hit the targets that we are trying to reach?

Sarah Moyes: Yes. I echo what Iain Gulland said—I completely agree with him. We recognise that the circular economy is important. At one point, Scotland was seen as being a bit of a pioneer on the circular economy. Other countries are working towards that and—as Liz Smith mentioned—a specific bill was proposed. However, that bill is no longer on the table. As I said, I understand why it was shelved, but we now have a plan that will not embed circular economy principles across everything, so it feels as though we are slipping away from that idea.

The circular economy is not something that Scotland can do on its own—it is a global issue. As I mentioned, the plan update states that we are at real

"risk of 'offshoring' a significant proportion of"

our emissions, but there is nothing in the plan to address that.

It is not just a waste problem. The idea needs to be embedded across the sectors, or we will reach a situation in which we manage to get control of waste but it will have no effect, because other sectors will not be using a circular economy approach. A circular economy bill is vital—it would be a key piece of legislation, so I hope that one will be back on the table pretty soon.

The Convener: We are talking as if the circular economy has been completely shelved, but it is important to note that we have been in a pandemic, which is why the bill was not taken forward. There is will across the political parties; every political party in the Scottish Parliament wants a circular economy bill, so I fully expect that such a bill will be back on the table.

Claudia Beamish (South Scotland) (Lab): We have touched on how the draft plan should do more to move Scotland up the waste hierarchy, and we have delved into the circular economy. I have a specific question for Iain Gulland. Does the plan reflect the recommendations of Zero Waste Scotland's decoupling advisory group in relation to putting the circular economy at the heart of the public sector and supporting innovative business models, which Zero Waste Scotland highlights a lot?

Iain Gulland: I will probably reference things that I have said before. On the recommendations of the advisory group, there is recognition in the climate action plan that the circular economy needs to be more embedded across industry and society, and there are references to consumption emissions. It therefore clearly recognises what the advisory group has been saying. There is recognition that we need to fill the policy gap for between 2025 and 2030, and there is acceptance in the plan that we need longer-term policy decisions and reforms.

There is weakness, to some extent, in relation to how much the plan will embed the circular economy approach outwith the waste sector by asking the various industries to think more proactively about circular economy principles and what they can do to reduce consumption. There is ambition and there is recognition, but this goes back to the previous question about how we get industries to start thinking seriously about how they report and reference circular economy strategies in their approach to net zero. Clearly, that is what they are all being asked to do, but the question is whether the plan goes far enough to embed circular strategies.

I have not yet referred to a circular economy bill, but there is clearly an opportunity for such a bill to come back. Perhaps it will be more ambitious, when it does. We have learned a lot even since the pandemic, and the climate action plan has come out. In relation to systems, there is an opportunity, through a bill, to think about the fiscal instruments that I have talked about, and about the system thinking that is set out as an ambition in the action plan. We need to start thinking more about how systems can be reorganised or realigned for the outcomes. A circular economy bill would give us the chance to lift ourselves a little bit higher and to think about a systems approach.

Claudia Beamish: I will dig a little bit deeper on one sector, the construction industry, so that we can hear a little bit about how it can push forward. I am wondering about use of materials in that

sector, and about remanufacturing and the skills that are needed for that. I ask Iain Gulland first whether he has comments on that. If anyone else would like to answer, they can do so through the convener.

Iain Gulland: The built environment is obviously crucial. We are developing in relation to it; for example, there are now targets in a lot of buildings around performance, climate change and operational carbon emissions.

However, we need to start thinking about the embedded carbon that is going into the materials that we are using. People are beginning to talk about that aspect, although they perhaps do not yet have full awareness of it. When we build for the public sector, we must ask, for example, what materials are being used. The budget that was published last week included lots of references to reutilisation or refurbishment of buildings, which illustrates that we should be asking whether we need to build something new or could instead refurbish or reuse an existing building. First and foremost, we must ask how we can get that type of thinking into our construction sector so that the totality of the carbon impact of our buildings includes not just the operational but the embedded carbon in the materials.

Everybody talks about using steel. We do not make steel in Scotland, but there is an opportunity for us to manufacture it by using electric arc furnaces. We have the third most energy-efficient grid in the world. If we were to take that approach, our embedded carbon level would be much less than that which results from our buying steel from other parts of the world, where there is a chance that it has been made using coal-fired furnaces.

We need that type of thinking in our people in construction and the built environment, our commissioners and our designers, who need to start thinking seriously about their choices of materials when they are building or refurbishing. They should also consider how we might facilitate use of existing buildings in our communities and our society. We must ask ourselves whether they are being set targets, whether they are receiving support, whether there are tools that they can use and whether there are demonstrator examples that they can look at to enable them to understand what the future could look like in the built environment.

That is an example of an approach that could be more embedded in key sectors, which would give them a focus through which to address not only operational but embedded carbon.

I am sorry; I missed the second part of your question.

Claudia Beamish: It was about skills. I am not sure whether anyone else wants to comment.

Iain Gulland: I am glad that you asked about skills, which someone else had touched on. Skills are hugely important. We cannot underestimate the shift that we expect in Scotland over the next 10 years. If we are to hit our targets by 2030, there will have to be significant change in the ways in which we work and live, and our businesses will have to adapt. We need to think seriously about the skills aspects of not only green jobs but all jobs, and to ask ourselves how they will be different. We must raise awareness and accessibility to enable us to understand how matters such as information technology and digital approaches can embed circular principles across the piece. We need people to have such skill sets.

In working with the public sector we are now talking about having the capacity and skills to measure, develop and implement circular economy strategies and net zero approaches in real time, over the next five to 10 years. We do not have time to wait until people come out of universities or colleges to come and help us. We absolutely have to have their input but, as another witness said, we cannot sit around and wait for 2025. We need to start now, so embedding skills and providing support and education will be crucial.

The Convener: I am going to bring in Kathryn Dapré, after which we will need to move on to the next set of questions, as we are rapidly running out of time.

Kathryn Dapré: I want to make a quick point about the construction sector. From a public sector point of view, there are huge opportunities in construction to move the debate on to net zero and the circular economy.

I and a number of my colleagues were involved in a steering group on the new net zero carbon public sector building standard, which will be issued this year and will take us some way towards zero carbon. It includes information on embodied carbon and choice of materials. I should explain that my role as chair of the Sustainable Scotland Network is an extra one; my main job is as head of energy and sustainability for NHS Scotland, which has recently developed a guide to sustainable design and construction. It contains a big section on embodied carbon and choice of materials, and it explores the question whether we should build new in the first place, or refurbish. I know that colleagues at Scottish Water have been doing a huge amount of work in that area.

We in the public sector can start to use our influence to move the debate forward. If we can come up with best-practice examples of buildings in which we have tackled embodied carbon and get information about them out there, that will be the big opportunity. There are lots of opportunities in the public sector to drive construction forward,

particularly in relation to refurbishment. Coming out of the pandemic, there will be less need for new builds, and we will have a lot of empty space as we move towards different business models. We need to consider how we will utilise that space better, so the reuse issue will be important.

09:45

The Convener: Thank you. We must move on.

Finlay Carson: We know that waste is a devolved area, but some areas of waste regulation are, quite rightly, being pursued at UK level to support the important UK internal market, to which we need to take a consistent approach. For example, reforming producer responsibility in relation to packaging at a UK level is likely to provide much more return on the investment. Iain Gulland touched on how important the fiscal incentives are. With reference to the fiscal incentives that are mentioned in the CCPU, do you think that the plans go far enough in relation to reform? What key fiscal reforms do you think are needed?

The Convener: I am not sure who wants to go first. We will start with Stephen Freeland and then work our way round the panel.

Stephen Freeland: There are some very exciting developments at the UK level. Extended producer responsibility will in many respects be the saviour for our currently flatlining recycling rates and if we get it right, it will be a significant step towards a circular economy, supporting investment, boosting recycling and extracting more material from the waste stream and capturing the value from it. EPR is a win-win; it helps the Scottish Government reach its waste and climate change objectives and, at the same time, it helps cash-strapped local authorities with the costs of handling the packaging waste by transferring it to manufacturers.

Plastic tax was mentioned as well. That has been warmly welcomed by the industry. It will help to unlock the investment in domestic plastic reprocessing capacity that we need in this country to reduce our reliance on export markets, which are becoming far more unstable—indeed, some are being cut off altogether.

In the background material there was talk of an incineration tax. Thankfully, that is not in the plan, as we should be waiting for EPR reforms and the plastic tax to do the job before we start to think about an incineration tax. Those are the more sophisticated tools that we need to stimulate more recycling. Energy from waste is a last resort for residual waste that cannot be recycled—after efforts to recycle and reduce, that is the stuff that is left over. If you want that material out of landfill to go to a—[*Inaudible*.]—place that has greater carbon benefits than landfill, it makes no sense to tax it when there is nowhere else for it to go.

There is not much reference to that in the plan other than that we will collaborate with the UK Government on EPR and plastic tax. I welcome that and hope that there is more collaboration than there was on deposit return.

Sarah Moyes: I echo what Stephen Freeland said. EPR will be important; it is included in the UK's environment bill at Westminster, which has been delayed for the third time. The Scottish Government needs to keep an eye on that—hopefully it will eventually come back later this year. That will be important.

In relation to other fiscal measures, that is not something that Friends of the Earth Scotland has done much work on, so I do not have any further comment on that issue just now.

Kathryn Dapré: I do not know whether there is much to add. I will say only that from a manufacturing point of view, it is important that the legislation covers the whole of the UK. Climate change does not recognise the border. Our manufacturers are typically supplying not just the UK but Europe, and countries all over the place. We have had feedback from manufacturers, certainly in relation to the NHS, that when they try to supply a product they get quite frustrated if there are different packaging regulations for it in different parts of the country or in different countries. That makes it very difficult for them. Having a UK-wide approach will make a huge difference and, if we can drag a lot of that stuff along, again that gives us less to worry about. If we can get issues such as packaging resolved at that first stage, there is less for us to worry about at the other end.

Iain Gulland: Producer responsibility is of course a potential game changer. However, I have two things to say.

First—[*Inaudible*.]—we need to go beyond just packaging. Obviously there are commitments at the UK and Scottish levels to look at other products and materials.

Secondly, it is key that we do not look at the issue just in terms of how we pay for the system and who pays—whether that be the public sector, the private sector or the producers. We need to change the system to make sure that producer responsibility incentivises smarter design and better supply chain stewardship, potentially rewards producers for good behaviour, rather than penalising bad behaviour, and supports local economies.

It is not about finding a way to drag all the materials out of our communities and into higher urban areas; it is about using opportunities for

reuse, repair or remanufacturing at a local level for our economies, not just here in Scotland but across the UK. It is really about how we design producer responsibility, rather than seeing it just as a way of shifting the payment schedule.

Again, the route map is a clear opportunity for such ideas to come forward, such as other fiscal instruments that we could deploy here in Scotland. I have already mentioned the potential of reprocessing credits, which would incentivise the reprocessing of materials here in Scotland. We used to have something called recycling credits, which allowed a clearer playing field to incentivise community recycling in particular. Why not reintroduce those? There has been mention in the past of reducing VAT levels, particularly on reuse and repair, to incentivise those types of activity, so that we make it more cost effective to get things repaired locally.

There has been talk about an incineration tax, but what we need is some sort of disposal levy. It is not about incineration versus landfill—as we have already said. We need to get away from a disposal culture, so we need to start thinking seriously about how we incentivise the circular economy. Rather than incentivising disposal or creating disposal routes that are easy for and accessible to everyone, we need to make those routes more challenging.

There are a lot of opportunities for thinking about fiscal instruments that could really make a difference in Scotland. EPR, the UK plastic tax and DRS have already been discussed, and I hope that they will come forward in the near future.

The Convener: We have some final questions from Angus MacDonald, who wants to dig in to some of the issues that have been raised about the public sector and procurement.

Angus MacDonald (Falkirk East) (SNP): I am conscious of time, so I will keep my questions as brief as possible. As the convener said, they are on the public sector. The draft CCPU states that

"Scotland's public sector bodies have a strong leadership role in delivering the transition to net zero";

commits

"at least £95 million to decarbonise the public sector estate";

and contains multiple commitments to action in the public sector.

I direct my question to Kathryn Dapré of SSN. Does the draft CCPU set out a clear framework for action by public sector organisations, including what support will be provided, and are you aware of any concerns from public sector organisations about the capacity to deliver any of the commitments in the plan?

Kathryn Dapré: The plan certainly sets out the ambition, but we have a number of concerns about some of the underlying policies. As I have said, the devil is in the detail. It does not go far enough, at the moment, but that is more about the level of detail and the supporting policies, which are not really there.

The drive is there from the public sector, and it has been for a long time. We have been supporting public sector organisations for more than 20 years, and some of them are well down the line already. However, some of the detail on what has come up is not quite there yet.

I said at the start that we need some fundamentals on what each public body should be doing, how we should define net zero in each of the public bodies, how we should measure it and how we should report it. We already report under the public sector climate change duties. That requirement needs to be beefed up so that we all report on the same things and can directly measure and compare performance.

I mentioned that we still need a policy on carbon offsetting, because even if we go as low as we can go, there will still be some unavoidable emissions. Again, I will give an example from the NHS. Anaesthetic gases come under scope 1. They are not going away, so we need some guidance about how we deal with those.

You mentioned the £95 million; it is welcome, but it is a fraction of what we need. There are about 20,000 buildings in the public sector in Scotland, so £95 million works out at less than £5,000 per building to fully decarbonise, which is a fraction of what is needed. We need a great deal more funding.

We also need the funding to be made available in mechanisms that we can all use. There is a bit of a track record of funding being made available in such a way that it is restrictive from the point of view of technology or of timelines, or it carries a borrowing element. As the NHS and some of the other public bodies cannot borrow, that precludes us from being able to use certain funding mechanisms. We need more funding, but it must be flexible funding that can be flexed to match the right projects. At the moment, we have a tendency to manoeuvre projects to fit a particular funding stream because it must cover a particular technology or must be spent within a particular timeline. We need to get the funding right so that it is there and can be drawn down as necessary to support the project, whatever that is and whatever its scale.

We need to take a more place-based approach to our solutions and to facilitate much more collaborative projects, because we tend to work in isolation. We need to be able to get together to

look at bigger solutions. In that respect, our leadership is key. For the most part, our leaders are good, but they need to drive that approach throughout all their decisions. Climate change needs to be mentioned in all business cases. We also need to look at the business case procedures to ensure that we are not value engineering something out or costing something out because we follow our approvals routes in such a way that the monetary value of the carbon is not properly accounted for, with the result that we end up opting for the cheaper solution or the one that is easier to procure.

I am conscious of the time, but there is a host of things that SSN is looking at and trying to provide guidance on to our members. The will is definitely there. However, it is the same story—we need more money and more resources, and we need those to be delivered in the right way.

The Convener: I am so sorry, but we have run out of time. I thank the panel.

We move to our next panel. Again, we have an hour, so it is probably a good idea if members can direct their questions to individuals. We are going to concentrate on land use. I welcome Professor Pete Smith, chair in plant and soil science at the University of Aberdeen; Andrew Midgley, senior land use policy officer for RSPB Scotland, who is giving evidence on behalf of Scottish Environment LINK; Professor William Austin from the school of geography and sustainable development at the University of St Andrews; and Stephen Young, head of policy for Scottish Land & Estates. Good morning to you all.

I want to ask about the 2030 target. Additional abatement effort has been allocated to each sector on a pro rata basis, with the exception of industry and agriculture. What are the implications of the additional abatement effort that would have been allocated to agriculture instead being allocated to land use, land use change and forestry—LULUCF? Do you think that there is enough in the CCPU to reduce any uncertainties around that? Are the pathways in that regard obvious?

I invite the witnesses to comment in the order I introduced them, starting with Pete Smith.

10:00

Professor Pete Smith (University of Aberdeen): There is an issue in allocating the additional effort to just the LULUCF sector. The issue is not that in itself, but we need to consider the role of agriculture when we think about LULUCF. The Climate Change Committee recommends a reduction in the consumption of the most carbon-intensive foods—for example, beef, lamb and dairy—by at least 20 per cent per person, and it also recommends reducing food waste. If we push for healthier diets with less meat and dairy, we could free up huge swathes of land for nature-based solutions and additional mitigation.

Considering only land use and agriculture is not the best way to go; we must consider such things together. Actions that we take on agriculture will free up land, which will give us the potential to carry out activities in the LULUCF sector. We need mitigations in the agriculture and food sector, which will provide co-benefits and mitigations in the rest of the land sector.

Andrew Midgley (Scottish Environment LINK): I agree with Pete Smith. What jumps out at me, in relation to protecting agriculture to a degree and the LULUCF sector taking up the slack, is that, when the Climate Change Committee provided a scenario for how we might be able to get to net zero, it mapped out how we might get there in an integrated way. It was envisaged that dietary changes would lead to changes in agricultural practice and land use, which would free up land for various other uses. An integrated approach was taken.

Such an approach has not been taken in the climate change plan. In essence, the Government has tried to protect agriculture to a degree and stick the LULUCF sector with more to do. That points to a lack of integration in the Government's approach to reducing emissions across the food, agriculture and land use sectors.

We could say that, if the LULUCF sector has to do more, it will have to deliver more. However, what land managers do on the ground is affected by policy, and one of the biggest drivers is agricultural policy, so what happens in agriculture has implications for how much the LULUCF sector can deliver. At the moment, lots of people are treading water because there is no clarity about the future of agricultural policy and support payments. People will not be making big decisions to, for example, plant more trees, go into other forms of production or provide other nature-based solutions. Even though it is expected that, notionally, the LULUCF sector will deliver more, it will not necessarily be able to do that because it is linked, through the policy framework, to what happens in agriculture.

Professor William Austin (University of St Andrews): Thank you for the invitation to speak. My role is to provide expertise in the marine environment. In relation to land use and the land use change sector, there is an opportunity to consider the implementation of emerging environmental land management schemes for coastal wetlands. That issue intersects with my expertise.

I echo the comments of the two previous experts. Nature-based solutions are the way forward for us, and those are somewhat broader than the scope of the climate change plan update.

Stephen Young (Scottish Land & Estates): Agriculture and land use go hand in hand. Separating them out creates problems, because the business and practical decisions on the ground are made largely by the same people.

The two should not be in competition—they should be working together, and choices can be made about how certain elements fit together. In agriculture, there is a feeling that when the sector does good, as it were, on carbon sequestration, the benefits are immediately taken away and it is left with the bad. That goes the other way, too. We need a much more joined-up approach; I agree that the ambition needs to be matched across all areas so that it is reflected in agriculture as well as in land-use change. A more rounded approach would be helpful. As I said, both areas involve largely the same group of people, so such an approach would make things easier for them to understand.

The Convener: A few of the witnesses mentioned nature-based solutions. We move on to questions on that topic from Finlay Carson and Claudia Beamish.

Finlay Carson: First, I want to touch specifically on peat. The Scottish Government made a commitment to restore 20,000 hectares of peat, but over the past couple of years it has managed to restore only 6,500 hectares. How can peatland restoration be further supported? Do we have any chance of reaching the target that the Government has set, or indeed other targets, given that much of the evidence to the committee has suggested that we need to go much further on that? Are we missing the policies and proposals for peatland that would deliver on those targets? I will go to Pete Smith on that question first.

Professor Smith: That is a good point. The main thing that is preventing us from restoring greater areas of peatland is a lack of qualified people to undertake the rewetting and conservation that is involved. We need to think about whether we can train more people to fulfil that role. I think that we could do so as part of a green jobs-based recovery. There are relatively few contractors who are trained to do that work.

We could either train contractors in the private sector to enable them to undertake peatland restoration, or we could undertake those actions through NatureScot or something similar in the public sector. We lack the personnel and skills rather than the areas or the willingness to restore peatlands. We could consider that in the context of recovery—we could train more people, build capacity in the sector and get people out on the land doing good, well-paid, green jobs to restore those peatlands. That would be a step in the right direction.

Finlay Carson: Several of the respondents to the committee's call for views noted the importance of nature-based solutions and land management options beyond peatland restoration and woodland creation. Bringing all those things together to address climate change, biodiversity and so on is a key part of a co-ordinated approach. Do you see any evidence of a co-ordinated approach to nature-based solutions that will address those issues?

Andrew Midgley: First, I want to offer a couple of remarks in response to your previous question. I took it from what you said that you were asking whether it is really feasible that we can meet the targets given that we have not managed to do much to date. We should not necessarily think about delivery to date as an indicator that we cannot do stuff in the future. We have to do much more in the future, so the question is what we need to put in place in order to be able to do more.

Is it feasible? Yes. Is it realistic? Yes, but it totally depends on how much effort we put in. Is it sufficient? No, and what the Government proposes does not go any further. The climate change plan was published in 2018 and the update does not go substantially further on peatlands. The aspiration then was to restore 250,000 hectares by 2030, and the current aspiration is still in that ballpark.

What has happened is that the money has been allocated, and the update does not go further. We are now putting in place a commitment to funding, which is great, but even so, we still have more than a million hectares of peatland that is degraded in some form. That does not mean that it is completely bare, but we are only scratching the surface of a very big problem. We have made a good start, but we are not going far enough. That makes the question even more difficult.

Is the target realistic? Yes, but it depends on how much effort we want to put into it. I would say that peatland restoration is a really important issue and we must put the effort into it. It relates to what Pete Smith said, because it can be linked to a green recovery.

On how we support it, one of the issues relates to contractors, the multi-annual contracts and the practicality of how we deliver peatland restoration on the ground. One of the real challenges is that there is only a short window between the breeding season and winter, so contractors struggle with the practicalities of taking on peatland work. There are long periods when they cannot work on the

site and they have to do other work. It gets complicated.

We could support the work by trying to develop proposals that are more integrated. For example, we could have proposals for landscape-scale ecological restoration that includes a suite of work that can be pieced together. That would enable contractors to deliver more work, which could be spaced out during the year. That might involve tree planting, fencing, river restoration or deer management as well as peatland restoration. In that way, when a contractor reaches a point where they cannot do one thing, they will be able to go and do something else. Integrated, landscape-scale approaches might get past some of the challenges that contractors face.

Another way to deal with it is to commit to multi-annual contracts. The Government has committed to multi-year funding, but committing to the contractors and saying that they can have contracts that run over several years would give them greater security.

On what is missing, I think that there may have been a timing issue regarding when the climate change plan update was released, but the Scottish Government announced in Parliament that it wants to move in the direction of licensing muirburn and revisiting the definition of peatlands. The commitment to those things is welcome and it would be useful for them to be included in any revised, updated plan after the process.

The second part of your question was about nature-based solutions and how they should be deployed. Although I am representing Scottish Environment LINK, I can talk about some work that RSPB Scotland has done to try to calculate the huge amount of carbon that is locked up in designated sites in nature-rich areas. The peatland story shows us that habitats that are in poor condition either release carbon or do not sequester as much carbon as they could. We could achieve a lot by focusing on ecological restoration to lock up, maintain and store carbon.

There is great potential for imaginative nature-based solutions. We could create a national nature network that would link habitats, which would also create work in the process. I have talked a lot, so I should stop.

The Convener: Claudia Beamish has some additional questions on the subject. Claudia, it would be useful if you could direct your questions to particular panellists. If others want to comment, they can always type the letter R in the chat box. We do not want to miss anyone.

Claudia Beamish: I will direct my question initially to Pete Smith. Everyone knows that the climate change plan update commits to phasing out the use of horticultural peat, which should be carried out in a way that avoids offshoring. Will you comment on that? Secondly, should there be an end to the granting of time extensions for existing peat extraction sites?

Professor Smith: In a word, yes. We should not grant any further extensions. A number of requests to extend peatland extraction for horticulture came up last year, most of which were declined, I believe, by the local authorities. Peatland extraction for horticulture is not compatible with our 2045 zero target, so we have to stop granting extensions. Most contractors put in place a restoration plan, which they submit with their planning application. As a country, we should decline requests for extension and insist that the restoration plan is implemented immediately.

10:15

On the point about offshoring, we need to ban horticultural peats and the use of peat in horticulture. If we allowed peat to be sold but did not allow it to be extracted, people would just get it from elsewhere. If we ban the sale, we can have some control over that, and it would be best if that was done not only in Scotland but at UK level. I urge the Scottish Government not only to ban horticultural peat soon, but to get together with the other Administrations in the UK to try to get a UK-wide ban.

Claudia Beamish: Unless anyone else has some quick comments on that, I will hand back to the convener.

The Convener: Thank you, Claudia. Liz Smith is next.

Liz Smith: The written evidence from the RSPB states:

> "The Land Use Strategy has a critical role to play and fails to appear because the Scottish Government has itself failed to fully integrate the LUS into its ways of working. This is a huge oversight."

I seek comment on that piece of evidence. How significant is that issue in holding back the strategic use of land? That question is probably for Andrew Midgley.

Andrew Midgley: It is really significant. In the environment sector, we view the land use strategy as potentially incredibly important. It was created in the original climate change plan with precisely the intention of trying to create a strategic approach so that we did not just have a piecemeal approach and end up creating negative consequences. We could do all sorts of things that could have unintended consequences, and we want to avoid that.

The land use strategy has gone through quite a long process and several iterations. The third one has just been consulted on and will be released

shortly. However, it has not really been embedded in overarching Government policy in any meaningful way, so agriculture and forestry operate in their own sectors without necessarily referencing the land use strategy. We do not have a clear statement that much land use is unsustainable and that we need to go in the direction of improving the sustainability of our land use. Lots of that is missing.

The climate change plan update refers to regional land use partnerships. Unfortunately, that is not in itself sufficient because, although the partnerships could be a useful innovation, the Government appears to have changed its approach. It originally said that it wanted to establish partnerships by 2021 and then publish frameworks by—I think—2023, but now it seems to be rowing back a bit and it is going to create pilots. [*Inaudible*.]—in terms of agricultural and forestry policy moving forward, we are going to pilot the regional land use partnerships, so they will not necessarily inform the big decisions that are then made.

The regional approach was tested and evaluated between 2013 and 2015, so we already have experience of regional land use frameworks—in fact, a draft framework was published in the Borders. However, we are now revisiting that process. It seems that that will extend into the future the point at which the partnerships will become meaningful and helpful.

Liz Smith: That is helpful. Regional land use partnerships have been successful elsewhere because they have developed economies of scale and consistency of thinking. To be absolutely clear, are you saying that you would like the partnerships to be rolled out universally across Scotland because you believe that they can deliver added value to the way in which we approach strategic management?

Andrew Midgley: Yes. We support regional land use partnerships and they should be rolled out across Scotland, ideally all at once so that the same benefits accrue to all areas and they can be part of the policy development process. If we just go through pilots to start with, things can get slightly out of sync.

Liz Smith: In your first answer, you said that those partnerships are not enough on their own. What else would you like to see to improve the strategic management of land?

Andrew Midgley: Policy coherence is really important. There is very much a sectoral approach at the moment. The Government is proposing to do some good things and bring in changes to agricultural practice. It is also proposing to do peatland restoration and woodland creation. However, those proposals are very much for stand-alone things. There is some crossover, but not a huge amount. There is talk about agroforestry and getting more farmers involved in peatland restoration, but they are quite sectoral ideas.

It is important that we have a coherent rural policy that links all of that together. At the moment, we do not know what that looks like. A big piece of the picture is missing.

Stephen Young: Andrew Midgley covered some of the points that I wanted to make about the land use partnerships. At best, they seem to be stalling at the moment. There have been some reasonably good pilots that worked in the past, so we need to crack on with that if we can. Our members broadly support the partnerships, but we need to have the right tools if we are to make everything happen. There was talk of setting up pilots but only to look at peatland and forestry. Although that is a big part of it, we need to have all the tools available so that everyone is going at the same speed together.

In agriculture, the new individual sector groups are starting to be formed and to report, but we need that to move forward so that we have the recommendations and can tie them back into getting agriculture, forestry and peatlands together under a single plan and strategy for the future.

The Convener: We move on to questions from Mark Ruskell.

Mark Ruskell: I will start by asking about the emphasis in the climate change plan update on bioenergy and similar technologies, including bioenergy with carbon capture and storage. Do you think that the expectations and assumptions in the climate change plan update are realistic? How do you see the structure of the biomass sector in Scotland developing? Are we, in effect, going to have to rely on importing biomass to fuel biomass-powered electricity generating stations, with or without CCS, or will we be able to supply more of our domestic heat market through forestry? It would be useful to hear your brief comments on bioenergy. Perhaps Professor Smith would like to start.

Professor Smith: Currently, bioenergy is used at Drax power station in England, which imports its biomass for use in the production of bioenergy. If we want to use BECCS in Scotland, we have the capacity. We have access for pipelines for CCS offshore, in the North Sea. We have the physical capacity to do it and we have a large forestry industry that can provide some of the biomass that we would use. It is therefore a viable option.

There are tensions around using biomass for bioenergy and production forestry versus nature-based solutions, which tend to be better for biodiversity because they use native species and

have a range of co-benefits. There is therefore tension between nature-based solutions and the use of bioenergy and BECCS.

Scotland is one of the places that have capacity for BECCS because it has physical access for CCS facilities and underground storage and it has quite a large forest sector. If we are clever, that can form part of our portfolio of mitigation measures, but I repeat that the approach must be integrated into the landscape in an intelligent way so that it works and avoids all the risks.

It would not be sensible to import the biomass for BECCS. That would not help the climate and would somewhat offshore our environmental impacts. The responsible approach would be to do BECCS within Scotland's borders rather than to import the biomass.

Andrew Midgley: We are cautious about the approach that is being taken to BECCS. Pete Smith referred to the tension with nature-based solutions, which we want to focus on. It feels as if we have an unproven technology and a gap that we need to fill, so the gap is being filled with that technology in the hope that that will work out. That is a bit of an aspiration. We would like much more exploration of the impacts of moving towards a much-expanded focus on BECCS.

I will illustrate how BECCS needs to be thought about carefully. People might think about doing carbon capture in the north-east, which has the geographical potential. However, the north-east is an agricultural heartland, so we would start to think about how those things meshed. What changes would happen in farming? Would new land become available to plant crops such as short-rotation coppice? Much more foresight and planning might be needed to look at the trade-offs between sectors. We do not have that at the moment.

Mark Ruskell: I will move on to my next question, unless Stephen Young wants to speak.

Stephen Young: Most of the points that I would have made have been covered. The issues are about land use and the crops that are likely to be grown for bioenergy—some can damage soil. Offshoring the problem by importing—[*Inaudible*.]

The Convener: We appear to have lost Stephen Young's sound.

Mark Ruskell: I think that I got most of that.

It is interesting that, at the beginning, a couple of witnesses mentioned dietary change, which is often seen as a thorny topic. The CCC has recommended a 20 per cent reduction in the consumption of meat and dairy products. What might be the implications of that, particularly for farmers? Are there opportunities or threats? What should be the pace of that change? Should we nudge people along a dietary trend that already seems to be accelerating? As that change happens, opportunities to avoid offshoring would be created. Should we push things a little further, ahead of the dietary change curve?

Andrew Midgley: The issue is thorny and the CCC approached it in an integrated way. The CCC modelled a scenario in which reducing meat consumption would have an impact on farming practices and land use and would free up land for other things. It looked at the impact of that on emissions.

There are different things to tease out. A lot of land could probably be freed up without agricultural output having to be reduced by 20 per cent. There will not necessarily be a match in terms of the impact on the industry. Large areas of land are managed extensively, so some changes in diet—in lamb consumption, for example—might make more land available disproportionately. There are different ways of approaching that.

10:30

Clearly, if we go down a route in which there is a big reduction in meat and dairy consumption, there will be significant change. It is a challenge for the industry, which is why it is important to be honest with everyone that change is potentially coming. The just transition applies as much to agriculture as it does to other sectors. There are potential risks to businesses if they ignore the market, so people will have to innovate and adapt, and there is a role for Government in supporting the industry to change and, if everyone is being honest, in helping some people think about retraining and leaving the industry. There is an emphasis on knowledge exchange. In my experience, many of Scotland's farmers are dynamic, innovative and adaptable, and they will rise to the challenge.

The Climate Change Committee's scenario is not the only scenario. That is an important point. There is a conversation to be had around what we think the future of agriculture and the future of diet look like. We know that dietary guidelines say that we are eating too much meat and dairy. Reducing our consumption of that is the direction of travel, but how do we get there? The Climate Change Committee suggested that it looks like doing that would free up lots of land for tree planting and peatland restoration, but that implies an intensification of the remaining agriculture. That is what the term "sustainable intensification" refers to. That is not necessarily a good thing from a nature point of view. It could have good consequences, but it might have downsides, too.

There are other scenarios. The Food, Farming and Countryside Commission recently worked up a different model that focused on agroecology.

The model looked at freeing up a smaller amount of land—7.5 per cent was freed up—but agriculture was done differently, emissions were reduced and the population was still fed.

There are different models, which shows that there is a conversation to be had around how all this fits together in an integrated way. How much are diets likely to change and how can we change our farming production? What does that mean and how many trees will we be able to plant as a result? We are not having that conversation. The Scottish Government's agriculture and climate change strategic group tried to look at the issue last year, but it has been overtaken by events. We have not got into a real conversation about what the future of the agriculture and food system looks like in Scotland. We have just said that we need to reduce emissions in agriculture by trying to keep things broadly the same but improving emission intensity, and that we need to plant more trees. We are not having that integrated conversation about what the future looks like.

Mark Ruskell: I know that others want to come in, but I am particularly interested in opportunities. How will estates change how they look at their land? I am struck by the example of Comrie Croft, which is a former sheep farm in Perthshire. It got rid of the sheep and brought in other land uses, but it still has 3 hectares of horticulture. There is a negative side, but there are potential business opportunities. Could Stephen Young come in on that?

Stephen Young: I agree. Our members are very keen on integrated land management and using different parts of their land for different purposes, which helps with risk management and managing workload throughout the year. That approach makes a lot of business sense. A lot of this is to do with resource and making the best use of certain parts of land, which our members are keen to explore, but—I feel like I am repeating myself—I come back to the fact that all policies need to be integrated. They need to fit together, so that one does not run ahead of the others and divert decisions in a certain direction.

It also comes back to dietary issues. Health and environment go hand in hand, and there is quite a lot of education on both sides—not just for producers and supply chains, but for consumers. There is also the just transition, which Andrew Midgley discussed.

Food security is talked about a lot, and the discussion about that has changed, in that it is not about whether we have a war; it is more about having a degree of control over our production and environmental standards. We know that we can have an impact on those standards in Scotland for what we produce in Scotland, and we would keep some of the financial benefit, too. There is a broader conversation to be had about that, covering the quality and the quantity of meat and dairy in diets, land capability, farming practices, regenerative agriculture and agroforestry. How do we integrate all those different elements and create the best outcomes?

There is a slight danger that, when we look through the lens of net zero, carbon becomes absolute king. Carbon is part of that consideration, but biodiversity and other things need to come into it, too. We need to consider things in the round, rather than focusing too much on one element.

Professor Austin: I highlight an opportunity on the marine side. I mentioned coastal wetlands a moment ago, and there is an opportunity for blue carbon measures to be incorporated into greenhouse gas inventories. Coastal wetlands—salt-marsh habitats and so forth—are marginal agricultural land on the whole, and there are some nature-based-solution wins to be had.

My question is: what scheme will incentivise the change of land use, and how will it integrate those habitats into our greenhouse gas inventory? There are some great wins to be had from that marginal land, which is very important for wildlife and biodiversity.

Mark Ruskell: My colleagues will come back to blue carbon later, but I would like to hear a quick thought from Professor Smith on dietary change and land use.

Professor Smith: Those are very important, and there is a role for public procurement. We normalise plant-based diets by making them the default option in public canteens, in our schools, in our restaurants and in a number of other public procurement spaces. If we normalise those diets, we help to nudge people in the right direction.

There will be another option when carbon taxes become a thing; they are not a thing at the moment. In the future, international carbon taxes could be in place, and that would naturally make ruminant products—meat and dairy—more expensive. That, too, would help to nudge people in the right direction. I should note, however, that there are social justice and equity issues associated with that, so, if we were to raise any money from high-carbon food taxes—for instance, on meat or dairy—we would have to use it to subsidise fruit and veg for poorer sections of the community. That would require some changes in the industry.

As was pointed out, however, there are some opportunities through diversification. Some meat will be left in the sector, and we must aim for less and better meat when we produce it in a grass-fed way from areas of obligate grass, which cannot be used for the production of anything other than ruminants, and when it makes sense to produce

ruminants, rather than doing anything else with that land. We could aim to produce high-quality, high-value products from that land—there does not necessarily have to be the threat to the industry that there might at first appear to be.

The Convener: Thank you, Mark. We move to questions from Finlay Carson.

Finlay Carson: I am delighted that Professor Smith thinks that there might be some meat left in the sector.

I despair at this conversation. It seems to be particularly one sided. We have considered how land use integrates with food production and whatever, but I do not believe that enough consideration has been given to what the land would be used for if not for livestock production, given that 65 per cent of the UK landmass is only good for growing grass, and is not good for growing plants for vegetable-based diets.

There is a worry that, given that meat production is not the same around the world and UK farmers are significantly better at producing red meat with a low environmental impact, we are looking at the issues in a silo. We are not balancing the impact of meat production with the impact of land abandonment, which would pose issues for biodiversity. We must also take into account the fact that agriculture accounts for only 5.5 per cent of the country's greenhouse gas emissions. It seems utterly crazy that we are looking at reducing meat production by the levels that Professor Smith suggests, particularly given that farmers have already committed to net zero agriculture by 2040, which is 10 years before the whole country is looking at reaching net zero.

I am concerned about the risks of trying to encourage people to reduce dairy and meat consumption in their diets, because investment in that area will not return what is needed. The vast majority of people in the UK like to have meat and dairy in their diets. Would it not be better for us to support farmers to go that little bit further?

The Convener: Do you have a question, Mr Carson? To whom are you addressing it?

Finlay Carson: Yes, convener—my question is for Professor Smith. Is the argument really balanced? Are we looking at the impact of a reduction in meat production in this country, such as the chance that that will lead to offshoring? Are we looking at the impacts on biodiversity and so on? Are we looking at soil improvement, given that we know that grazing improves the soil in the UK?

Professor Smith: Agriculture actually contributes about a quarter of our greenhouse gases. I just want to put that figure out there, because you mentioned a lower number. That contribution therefore needs to be addressed.

Global studies have shown that if we continue to eat meat-intensive diets in the way that we currently do—and our consumption is projected to increase—we will surpass the 1.5° limit by diet alone. Even if we reduced all our emissions in all other sectors to zero, continuing with our current diet would push us beyond the 1.5° limit. We therefore have a responsibility, as global citizens, to reduce our meat intake.

As members will know, the largest greenhouse gas footprint comes from ruminants—that is, lamb, beef and dairy—which account for more than 50 per cent of all animal-based global greenhouse gas emissions. Ruminants are therefore the target for greenhouse gas reduction. We must act—we cannot defer action and say that Scotland is the exception because we farm in a relatively environmentally way in comparison with other countries and so should get a get-out-of-jail free card. In social justice and equity terms, we currently overconsume protein by between 80 and 100 per cent. We could eat a considerably lower level of animal-based products without significantly affecting our diet. We could certainly cut our diet in that respect and contribute globally to reducing emissions from food, particularly in the livestock sector.

The Convener: We need to move on, so we will have some questions on deer management from Angus MacDonald.

Angus MacDonald: The Environment, Climate Change and Land Reform Committee and its predecessor, the Rural Affairs, Climate Change and Environment Committee, have long agonised over the issue of deer management. The final report of the deer working group, "The Management of Wild Deer in Scotland", highlighted the role of deer management in ensuring the success of climate change mitigation measures in forestry in particular.

Several respondents to the committee's call for views noted the omission of deer management from the climate change plan update. Why is deer management important, and what policies, funding and statutory mechanisms should be included in the plan to support it? I will go to Stephen Young of Scottish Land & Estates first, followed by Professor Smith.

Stephen Young: The timing of the update is tricky, because we have not yet had an official Government response to the deer working group's report. The report raises some contentious issues and cuts across some of the recommendations that NatureScot made as a result of its deer management assessment in 2019. That work is not ready to be included in the update, but there may well be a role for it in the future.

The deer management working group does a lot of good work to highlight peatland restoration and forestry, which are areas that cannot be—[*Inaudible*.] There is a huge role for those areas as well, in the future.

I would expect deer management to come into the plan later, but there is a timing issue at the moment.

10:45

Angus MacDonald: Does Professor Smith have a comment?

Professor Smith: Not really. We know that controlling deer is important in relation to native forests when they are planted—some form of deer control is needed. However, I do not have any specific expertise to enable me to comment further.

Angus MacDonald: Does anyone else want to comment?

Andrew Midgley: We think that deer management should be included in the plan's update. The most immediate impact is on woodland creation and peatland restoration. There is a timing issue to do with the response to the deer working group, but there are things that could be included. For example, the Forestry and Land Management (Scotland) Act 2018 establishes a duty on public bodies to deliver sustainable forest management, but it does not include any reference to deer density, which could be part of that duty. If deer density was set at five deer per km^2, that would allow woodland expansion through natural regeneration, which could be a cheaper option for delivering the scale of change that we want to see and would be a big win for nature-based solutions. It would also be useful to remove the incentives for muirburn for deer management—I think that that is mentioned in some of the papers that committee members have received.

Angus MacDonald: Indeed. Is it fair to say that you would have expected to see some of the recommendations from the deer working group report reflected in the plan?

Andrew Midgley: That is right.

The Convener: We move on to blue carbon with Claudia Beamish.

Claudia Beamish: Professor Austin raised the important issue of marginal land. I highlight for the record that current emissions statistics do not account for carbon sequestration or potential emissions from marine or coastal habitats such as salt marsh, kelp forests and maerl beds—the so-called blue carbon ecosystems. Given the emerging evidence base, which is becoming increasingly robust, should the updated plan include specific policies and proposals to protect our blue carbon stores? If so, what should those be?

Professor Austin: I agree that there are opportunities in the 2018 climate change plan regarding the broad incorporation of blue carbon. The update has nothing specific on that. However, there are two habitats that fit the international frameworks for the implementation of greenhouse gas inventories. As you said, salt marshes would be one. Their distribution is well understood and they are critically threatened habitats, globally. They are probably the most threatened habitat on the planet. They are particularly vulnerable to sea level rise, which is being driven by the impact of climate change, so we need to think about how we manage those habitats as the sea level rises.

We have the opportunity to move towards implementing UK greenhouse gas inventories for the salt marsh habitat, in particular. However, as you will know, that is a matter for the UK Government and the Department for Business, Energy and Industrial Strategy. The question is how quickly the Scottish Government can move forward with it. We have been working with Marine Scotland and NatureScot to develop our understanding of the habitat and stocks and we are close to being able to move forward. It would be a good thing to raise ambition in the plan.

Claudia Beamish: That is a helpful amount of detail. Given that typically only a small portion of research is publicly funded, does the Scottish Government's level of commitment to research do enough to give confidence to the private sector to invest in the blue carbon sector, especially when contrasted with what is being invested in peatland restoration, which is, I believe, £250 million over 10 years?

Professor Austin: In the sector that I sit in, we are very hopeful for future funding for the area. It is a relatively new area and our knowledge and evidence base is accelerating rapidly. The opportunities probably lie in Government implementing some of those inventories and signalling in a policy context the opportunity for environmental land management schemes. For example, we might assist with the sort of verified carbon standards approach that could attract funding to implement the management schemes that we need. Some of those schemes will be large scale and expensive, so we need some additional support for that work.

Claudia Beamish: Could you give a quick example of what one of those schemes might be?

Professor Austin: To commend the work of the RSPB, the Nigg reserve is an example of the type of coastal realignment scheme that has been

developed to create habitats. Although they have probably not been developed in the context of blue carbon, we are increasingly realising the benefits of coastal realignment schemes in creating carbon sinks. That is the type of large-scale project that needs investment and which creates opportunity for nature and climate.

Claudia Beamish: I know that other colleagues have questions on blue carbon, so I will hand back to the convener.

The Convener: We will go to questions on marine protected areas from Stewart Stevenson.

Stewart Stevenson: According to NatureScot's report of three years ago, marine protected areas represent only a tiny proportion of our blue carbon stores. When we are looking at marine protected areas, they should therefore be part of the wider spatial management of the marine and perimarine environment—I say "perimarine", because the freshwater estuaries that go into the sea of course come into the picture as well. Perhaps Pete Smith might care to pick up on that area in the first instance.

Professor Smith: Bill Austin is really the expert on that. However, marine protected areas and estuaries have an important role to play, as do underrepresented nature-based solutions. As the committee knows, we hear a lot about forests and peatlands, but coastal and marine ecosystems are understudied. As Bill Austin said, we think that there is large potential in them for climate mitigation and adaptation.

Research in the area is a little less mature, so we need to understand more about the systems. We also need to include them in the greenhouse gas inventories. They are not very well represented in our current inventories, and to be able to claim the benefits from climate mitigation actions, we need to be able to show how much greenhouse gas emissions are reduced or how much carbon sinks are increased. That is another aspect that we need to do—we have to implement them in the national inventories over the next few years.

Stewart Stevenson: You are pointing me to Bill Austin, which is fair. As he works at the University of St Andrews, he is on the doorstep of Tentsmuir forest. I think that Mugdrum island, which is round the corner and up the Tay from the university, has the last commercial reed-bed for thatching. Both of those—[*Inaudible*.]

I ask Professor Austin to comment on that issue and expand our knowledge. He will not have to try very hard to do that.

Professor Austin: I thank Pete Smith for a very positive endorsement of blue carbon opportunities.

On marine protected areas, the national marine plan is forthcoming. In that plan, more needs to be done for a wider zoning of the sensitivities of our sea bed in particular. That needs to include a fresh look at the way that we manage our fisheries.

On the coverage of marine protected areas and our blue carbon resource, Scotland is, of course, blessed by a very large share of the UK exclusive economic zone, and much of the carbon resource in surface sediments, in only the top 10cm of our sea bed, is very widely distributed in a whole range of habitat types. Our work has shown in particular that there are hotspots for carbon burial. One opportunity for us in that area is to focus on blue carbon hotspots.

I have been particularly interested in the recent judicial review of fisheries in areas off Skye and what the Scottish Creel Fishermen's Federation, for example, has said. I will give members a thought. The proposal to separate mobile and static fishing gear creates an opportunity to reimagine the services of our sea bed in terms of the carbon resources there. That is a very interesting scenario for the Government to look at more closely, given the judicial review.

You broke up a little during the question about Tentsmuir. I am sorry that I missed that.

Stewart Stevenson: The Tentsmuir and Mugdrum island references were simply to remind you that I was brought up in Cupar in Fife. They are, of course, on your doorstep.

More fundamentally, you referred to hotspots for blue carbon. Do policy makers and—[*Inaudible*.]—generally know where they are? Ten years ago, we had a marine atlas that tried to integrate a lot of different bits of knowledge about the marine environment. If I recall correctly, there was a bit about those areas in it, but maybe not as much as we need. Do we need to spend more to understand where the opportunities are and to start to rank and protect them?

Professor Austin: That is another great question. I think that we increasingly know. We have contributed to Scotland's marine assessment 2020, and we have a good understanding of the spatial distribution now. We understand the stocks, and that is the starting point for the carbon resource if we are to think of it in those terms.

The question about how to manage the hotspots is very interesting. We do not designate for blue carbon; we designate for other criteria. That goes back to the point that I made about the forthcoming national marine plan holding an opportunity to look at zoning for sensitivities rather than simply creating more and more marine protected areas. The MPAs are, of course, increasingly under review. Yesterday, I saw that the Marine Management Organisation has a

consultation on banning trawling in four of the English MPAs, including Dogger Bank. That will certainly be something to look at.

11:00

Our blue carbon opportunities lie on the west coast, particularly in the sea lochs. We have the world's first national inventory of those carbon resources. We know that those are places of national importance. They have relatively few pressures and represent Europe's most pristine marine environments, so there are easy wins to focus on there.

Having such sedimentary carbon stores will not contribute to our net zero ambitions, but it will contribute to our wider appreciation of the marine environment, its protection and its increased resilience. However, they do not fit the framework to be implemented into the greenhouse gas inventories. If we want to achieve that in the plan, we need to focus on the two habitats that I have mentioned already, which are seagrass beds and salt marsh habitats in the coastal wetland fringes.

The Convener: We are rapidly running out of time. Stewart, could you address your question on green recovery to our witnesses, after which we will round off?

Stewart Stevenson: That is exactly what I was going to do. I did not see any other member indicate that they wanted to come in on my previous question.

I have a brief question on green recovery, which I will direct to our witness from Scottish Land & Estates. Have we covered green job creation sufficiently in the update? There have been references to it as we have gone along, but not a direct reference. Should there be more to say about that? I suspect that I will need to hear only from Scottish Land & Estates on that question, convener.

Stephen Young: It is a fair question. We need to focus on the whole issue of rural employment. I bang on about rural Scotland being a bit like a Rubik's cube: if we focus only on one side, we knacker up another side for someone else. We have to think about the economic, environmental and social issues as well, so we could do with a section focusing on those aspects. Earlier we talked about skills and job creation in peatland restoration and about forestry management skills. However, we must also consider how we can maintain existing jobs and reskill them so that they provide more environmental benefits, which goes back to the point about farming techniques.

Whether we will be able to adopt such an approach will come down to funding. Our discussion has not touched on carbon markets and on-going funding of business for forestry and peatlands. We need to explore how we could get sufficient money and churn into our economy to allow jobs to be created and to keep schools and shops open. There is a lot of work to be done on developing that aspect if we are to keep money and internal infrastructure flowing and the rural economy moving. I agree with Stewart Stevenson's assessment. I also reiterate that it is dangerous to look at the subject from just one angle; we must look at all angles to see how we can achieve our aim. Therefore it would be helpful to consider exactly what kinds of jobs will be required. Some are mentioned in the update, but it would be good to have a bit more detail on how we tackle creating those and on reskilling traditional jobs—not just the jobs of the moment, which we have been discussing.

The Convener: I will bring in Andrew Midgley on that point, before we wind up our session.

Andrew Midgley: Scottish Environment LINK is keen to see the development of a Scottish nature service. There is potential to link our skills and training agenda with working towards nature-based solutions. There is a great opportunity there. We could forward papers on that subject to the committee if that would be of interest.

The Convener: It would be of interest. Thank you very much for that offer.

We will round off the evidence session, which has been very interesting. I thank all our witnesses for their time.

We will now have a short suspension and will return at 10 past 11, when we will hear from Chris Stark of the Climate Change Committee.

11:03

Meeting suspended.

11:10

On resuming—

The Convener: For today's final evidence session on the Scottish Government's updated climate change plan, I welcome back to the committee Chris Stark, the chief executive of the Climate Change Committee. What are your general views on whether the updated climate change plan presents a credible pathway to achieving our 2030 targets?

Chris Stark (Climate Change Committee): Good morning. I just want to check that you can hear me.

The Convener: We can hear you perfectly.

Chris Stark: That is great. It is nice to see you all, virtually, again.

At the outset, it is worth saying that, from my perspective, it is great that we have an update to the plan—a document—to consider. The plan is on the fringes of credibility, but so, too, is the Scottish Government's 2030 target. Since we last spoke, we have done what I think is the most detailed and thorough assessment of the pathway to net zero for Scotland and the rest of the UK. The CCC has built five separate scenarios for achieving net zero, none of which involves the Scottish 2030 target being met—not even the one that we deliberately constructed to get to net zero sooner than the statutory date. That troubles me and means that the 2030 target is very stretching. It is not my position that the target is wrong, but it will be extremely hard to meet it.

It is important to talk about some of the things that define the CCC's scenarios. In our work, we tried to minimise what we call capital scrappage—the stranding of assets that use fossil fuels—as much as possible, because that means that the transition tends to be easier and cheaper and has greater support. We have therefore tried to match the replacement cycles of assets—for example, by replacing a high-carbon asset at the end of its useful economic life with a low-carbon asset as much as possible. That could be flexed, which would mean that progress could be faster in Scotland.

In our work, we have assumed that there will be a regional strategy of rolling out zero-carbon solutions. It is possible that some things could be done earlier in Scotland. We have also not assumed that Scotland will take the lion's share of the negative emissions technologies that will be supported over the next year.

All those things could be flexed. However, even with that flex—doing more things in Scotland and doing them earlier—the strategy is right on the edge of what we might consider to be achievable, without doing more punitive things that tend to carry much less public support.

When I look at the updated plan, I see a process that has struggled to meet the exam question that the Parliament set for 2030. Achieving that target will be very difficult. It took 30 years to halve Scottish emissions from the level in 1990, and we will have to halve them again in the next 10 years. That is a huge challenge. It might be possible to do that, but it will be very hard.

The Convener: You mentioned negative emissions technologies. We have heard from some witnesses the criticism that the climate change plan update puts too much stress on the unknown and what might happen, without providing concrete examples, and on certain technologies that are not as developed as they could be. Is that an issue?

Chris Stark: It could be an issue. Negative emissions technologies are definitely worthy of further consideration. The plan sets out a stonking 6 megatonnes, almost, of greenhouse gas removals through negative emissions technologies, and almost all that is in the power sector. It is not a technology that we do not know about—it will involve using bioenergy with carbon capture and storage and connecting together all the various parts that we understand in engineering terms. We are confident that it can be done but, for me, the more interesting question is what that means in reality.

11:15

If we were to achieve the greenhouse gas removals projection in the power sector, as set out in the update to the plan, we would need a new power plant in Scotland that uses bioenergy with carbon capture and then stores the carbon under the North Sea. That would need to be constructed and operational by, I think, 2029—that is what is implied in the plan—so it would need to be done in the next eight or nine years. All that has to be brought together quickly. It is possible to do it. I am not really worried about the technology—we can do it—but the question is whether the policies are there and whether there is commercial interest in investing in that.

We can see similar issues across the plan, but it is particularly the case with negative emissions technologies. The other area where I would highlight a concern is decarbonising buildings. Mostly, the sectoral emissions reductions in the plan are a pretty close match for what the CCC has said in its analysis, except in relation to buildings. In that area, a much bigger fall in emissions is projected in the plan, and that will need a lot of intervention and change. Again, it is not really a technological concern; it is more of a practical consideration about whether that can be done in the next decade.

The Convener: You mentioned punitive actions. I guess that a risk of the speed that is required to achieve the emissions reductions by 2030 is that we will be able to get there only by creating some disadvantage to certain parts of society. Will you elaborate on what you meant by that?

Chris Stark: We wrote to the cabinet secretary, Roseanna Cunningham, at the end of last year when we had completed the work on the UK-wide assessment for the UK's sixth carbon budget, which has the detailed pathways that I talked about. In that letter, we noted that none of our scenarios gets to the 2030 target, although they get to the 2040 and 2045 targets. Actually, we are quite confident about those later targets; it is the short term where the biggest issue lies.

The 2030 target is a statutory target, and I am certainly not ducking the requirement to meet it. We have therefore suggested a few years where it might be possible to go further than our scenarios. Through that combination of negative emissions and perhaps the earlier start to decarbonised heat that we talked about, there is definitely scope to play with the routes for Scotland to make a faster transition.

As I mentioned, it is possible to do more punitive things. That would probably include more sharp effort on diet change, which is notably absent in general from the plan, and it would certainly include policies that scrap capital assets early—I am thinking in particular about boilers and cars. That tends to be a pretty unpopular approach, but it would certainly help in getting to the 2030 target. We have not recommended such steps UK wide, because we do not think that they would carry public support.

Again, it goes back to the Scottish ministers. What they choose to do over the next decade will be absolutely critical, and one of the big questions is whether they choose to go down the route of more punitive steps. That is pretty fundamental, because there is not really enough in the plan for me to understand exactly what ministers are planning to do on that. I would like to see more from the Scottish ministers on exactly how they plan to meet the 2030 target.

The Convener: We will move on to questions from my colleagues.

Liz Smith: Mr Stark, I am interested in your evidence today and from your previous attendance at the committee. To what extent do the different sectors that are required to meet targets have consistent objectives? Do they understand exactly what they have to do to meet the targets?

Chris Stark: It is worth saying again that the plan that the Scottish Government has produced is really impressive in its breadth. We do not have an equivalent at UK level, for example, to look at or scrutinise. However, it is hard to see exactly how the sectoral effort is allocated across the economy, except in annex C, which lays out what we call the carbon envelopes. That explains a bit more about how the effort should be balanced and spread across the sectors.

There are a few things to say about that. The first is a fundamental point. Annex C is very useful, because we can see the extent to which reductions in emissions are projected in each of the key sectors, and they are quite a close match with what we in the CCC have done. However, it is not clear to me whether the policies that are in the main document amount to those kinds of reductions, nor indeed where the deficiencies might be. I am very sympathetic to the idea that we should not have a full plan all the way out to 2030 at this stage; it would be difficult to do that, given all the changes that are around us. However, I would like to see something that explained a bit more the extent of effort between the sectors.

Secondly, a fundamental shift is clearly going on towards net zero, and that involves a huge amount of change in some of the fundamental systems that underpin the Scottish economy—including, notably, the energy system, and how we use land. Again, it is not that clear how well integrated those things are.

What we have in Annex C is a modelling exercise, which I find really interesting. It is also interesting that the Scottish Government analysts are very clear that it does not reach the 2030 target, as we have just discussed, so there has been a further step to allocate carbon pro rata across the economy, except for in the two sectors of agriculture and industry. It is difficult to see whether that amounts to a genuinely integrated plan from the Scottish ministers.

Liz Smith: Is that modelling effective when it comes to bearing down on some of the specific challenges to sectors that may not be doing as well as others? Would such a thing be helpful?

Chris Stark: Yes. We in the CCC also deal with the modelling challenge. In my former life in the Scottish Government, I saw it up close. It is difficult to get to net zero, when we look at the models. The Scottish Government uses the TIMES model, which struggles, especially in the short term, to achieve that kind of outcome. It is fundamentally an energy system model. Quite difficult things happen when some of the requirements that the Parliament has set are plugged in.

In that area, again, it is difficult to say with clarity whether the modelling is sufficient and how it is being used in the Scottish Government's policy process. I note only that it is good to see what looks to me to be a much more integrated plan than the previous ones. It looks to me—I would love to be able to say with clarity that this is what is happening, but we do not see it in the document—that the modelling is now being used in anger, if I can put it that way, around the Cabinet table, to discuss policy. From my perspective, that is great; it is real progress. Notably, in the agriculture sector, of which I have been very critical in the past, it appears now that the CCC and Fergus Ewing agree on the emissions reductions that are necessary over the next 10 years or so. However, it is just not clear to me how those emissions reductions will be delivered, through Scottish or UK policies. That implementation step is missing.

Liz Smith: Thank you. I have some more questions, about behaviour change; convener, do you want those just now or a wee bit later?

The Convener: I will bring in Mark Ruskell, whose question is supplementary to my line of questioning, then I will come straight back to you.

Mark Ruskell: I was just thinking about what Chris Stark was saying about punitive actions. We all are politicians, so we do not want to propose anything that is at all punitive; however, some of those actions seem to be pretty mild—for example, scrappage schemes. Do you have evidence that scrappage schemes are really unpopular with the public? We are talking about really fundamental—[*Inaudible*.]

—transitional shifts that are required in order to tackle climate change, or are we just a bit fearful of introducing anything that could be seen as a wee bit controversial? I am just trying to see the scale of the mission in what we have to do versus an assessment of may or may not be punitive. It seems a bit of a mismatch.

Chris Stark: At the start of the discussion, I talked about the conditions that we inject into our modelling. We try to avoid capital scrappage, to use that term—we avoid getting rid of capital assets before the end of their useful economic life, because we can see a path to net zero without the requirement to do that at scale. It can be done. The reason why I cannot answer your question directly is that I do not know under what conditions the Scottish ministers might wish to do that.

We have had successful scrappage schemes in the past that have made a payment to citizens to get rid of those assets. That kind of scheme is very popular. Ultimately, it depends on the willingness to pay for it. We try to avoid those things because we know that they carry a short-term cost to the public finances, but if the Scottish ministers are willing to do it, we can go faster, and that will bring the 2030 target into view. I used the word “punitive” but perhaps that is not the right word. Such schemes are only punitive if they do not carry that financial reward for those who are asked to scrap.

The Convener: Liz, we can go back to your questions on behaviour change.

Liz Smith: That is helpful, convener, because they are related to the question that Mark Ruskell has just asked and to Mr Stark’s responses. The real issue is about ensuring that we can encourage behaviour change. Nobody wants to be too punitive about it, but we do need that behaviour change.

I am interested in your ideas about how we encourage all the sectors right across Scotland to keep behaviour change at the front of their minds, while it is also our responsibility as individual citizens. How do we inculcate that as the prime point that will help to drive things forward much more quickly than might otherwise be the case?

Chris Stark: I have a few things to say in response to that. One of the questions is whether behaviour change is as fundamental as that. It is a fundamental part of the things that we need to do, but behaviour change alone will not deliver net zero. A combination of things will be necessary if Scotland is to reach net zero by 2045.

It is fascinating to see how interesting all this is to many of the people that I have spoken to since we published our latest work. We published a little piece of work looking at the emissions reductions that will be necessary during the next 15 years and asking ourselves about the extent to which those emissions reductions are about technology change or about behaviour change. It is quite interesting to look at the emissions reductions that we are projecting. They are for the UK but I think there is a rule of thumb that we can use for Scotland.

About two-fifths of those emissions reductions are about technological change alone. They tend to be the kind of stuff that we have been doing relatively successfully in Scotland and the UK during the past 15 to 20 years. Closing coal-fired power plants is a good example of a technology change that can be planned centrally in a policy written on a desk in London and there will be a big commercial response to deliver it. Crucially, the consumer does not tend to notice that kind of change. Last year, half of the electricity that was produced in the UK was zero carbon, which is a big change from where we were some years ago, but the consumer did not really notice it.

Interestingly, three-fifths, or 60 per cent or thereabouts of emissions reductions involve some element of behaviour change. The clue is that we will not make much more progress if we look solely to technological shifts or centrally planned policies to get us to the outcome that we are looking for. Only a small proportion of the behaviour change that will lead to emissions reductions is pure behaviour change. Two good examples are flying less and eating less red meat and dairy. Approximately 10 to 15 per cent of emissions reductions are sitting in that pure behaviour change category.

The rest of it, which is for me most interesting, is a combination of technological change and behaviour change. The classic example of that is the fact that, at the moment, we take our cars to the petrol station and we fill them up. In future, we might be driving an electric car, or we might be renting that electric car, but we will have to plug it in. That is a behaviour change. It might not be

particularly frightening, but we have to approach it as a behavioural shift.

Another, bigger shift is that we will not be using gas boilers to heat our homes; we will be using heat pumps or some other form of technology that does not cause greenhouse gas emissions. That might involve us heating our homes differently, so we may be pre-heating, as it is called, at off-peak times. Those sorts of behaviour changes are more significant. They are not that scary, but we will not get to that outcome unless we start the discussion about what those changes will look like and the incentives that will need to be in place to make them work properly.

I was really impressed by the draft public engagement strategy that was published alongside the Scottish Government's climate change plan update. It is much better than anything else that we have seen across the UK. My only criticism is that it is perhaps too focused on the climate. I talked about the two challenges of transitioning to electric vehicles and heating our homes differently. If those are framed as climate challenges, I suppose that we might see some success, but they might also be about air quality differences or changes in the home—they need not be framed only as climate policies. Ultimately, success will rest on finding what will motivate people to make the changes and framing those changes in the right way so that we see the success that I think that we all want.

11:30

Liz Smith: My final question relates to what you have just said and to two of your previous comments. We will be most successful in driving things forward if the consumer is understanding and appreciative of what we want to do. We have the best chance of success if we can engage new technologies with consumer behaviour and ensure that that all works together. Are there any areas in which there will be a consumer backlash and in which consumers will not be willing to make some of the changes that you feel are necessary?

Chris Stark: It is hard to say where public sentiment lies. It might be worth dwelling on an issue that I had not expected to be talking about a year ago, when the pandemic began: the rapid and exciting move towards walking and cycling, and our wanting to see more of that. That development has happened because of the pandemic and because we are not using public transport as much.

A few months ago, I would have said that that was a really positive development, but we have seen a backlash—notably in London, but also in Scotland. The rise of the motorist is a new theme in politics, with a backlash against some of the changes to cycle routes and the changes that have happened in towns and cities as a result. I worry about that. People in my circles have occasionally referred to the issue as a new culture war, and I note that, suddenly, Nigel Farage is on the side of the motorists and against cycle routes. Those changes have implications for some of the behavioural shifts that we have been advocating for in the CCC for a while. I see that less in Scotland, but the issue is definitely worth thinking about.

Returning to the point that I made in answer to your previous question, if we are framing everything as climate policies, we are resting a lot on people wanting to act on climate change and feeling that that is the primary motive. A set of wider things are going on that are equally important and that might have the happy benefit of cutting emissions. For example, walking and cycling have all sorts of benefits—they improve air quality and the health of the people who are doing those things—and, to me, those are better motivating factors than the fact that, in doing those things, we are helping the climate.

Again, I would like there to be more focus on the underpinning factors and maybe a more detailed and clever view of what would change motivation.

Liz Smith: That is very interesting.

The Convener: Finlay Carson wants to come in with a supplementary question.

Finlay Carson: [*Inaudible*.] Can you hear me?

The Convener: Yes, we can hear you now.

Finlay Carson: Chris Stark will not be surprised to hear that I am going to bang on about agriculture. However, maybe we should refer to the issue as food production—I think that the public would understand the issue a little bit better if we did that.

You have talked about carrying public support or there being punitive measures, or whatever. What modelling has been done on the CCC's objective of a 20 per cent reduction in the consumption of red meat and dairy and the effort that would have to be put into achieving that? Is that achievable in the short term? We need rapid change. Would we be better investing in farming and agricultural businesses to help them to achieve more of what they are already doing? That would include boosting productivity and, in turn, reducing emissions, maximising carbon capture by improving grassland and using bioenergy carbon capture and storage, which a lot of farmers employ now.

Is any modelling being done on the direction of travel that we should go in? Is it better to persuade people to eat less meat, or would we get a bigger

reduction in emissions by supporting agricultural businesses?

Chris Stark: We must support agricultural businesses. My main point about agricultural businesses—I think that this is inherent in the premise of your question—is that we should be broadening the discussion of the commercial revenues from agriculture and including a set of wider services such as environmental services, which would include carbon sequestration and other things that can be done with agricultural land.

You asked about diet change, which is an important aspect of the work that we have done. In the CCC's scenarios, there are reductions ranging from 20 to 50 per cent in the consumption of all meat and dairy, which would have a big impact on agricultural emissions and on how we use land across Scotland.

I know that NFU Scotland has urged a lot of caution around dietary change projections, and I have a few things to say about that. First, we are recommending only policies that provide information to the consumer in order to deliver that outcome, which we think is possible. We are not recommending things such as a meat tax—referring back to the sort of punitive measures that we were talking about a few minutes ago. We might be able to introduce that, but it is not in any of the recommendations that we have made. We are eating less meat, and we expect that trend to continue. We can see a difference between the older generation and the younger generation. That is happening anyway.

I think that we are deliberately missing the point here. If farmers diversified into other uses of land, I would expect them to be paid for it. We have to get the right policies to reward farmers and landowners for changing. It does not make sense to say that decreasing livestock production would threaten viability in a world in which there are a whole new set of avenues for land managers and farmers to pursue. I would much prefer to discuss the matter in those terms than to have dietary change seen as a threat. There is an opportunity to diversify. Of course, policy must support that, but that is the challenge. We must get the right policies in place so that we get a more harmonious outcome for the climate and the environment more generally.

Finlay Carson: You can achieve that by addressing the supply chain or the demand chain—I suppose that is where it is coming from. You can reduce demand—[*Inaudible*.]

Chris Stark: To be clear, we are not suggesting that all of that is done through changes in demand—it is really important to say that. Many of the changes that we recommend in agriculture are cost-saving measures for the farmer. They are things that would make agricultural production better, through more productive farming, and they would happen to save emissions, too. Through more regulation, alongside the changes in demand and reduced consumption of meat and dairy, we can get a better outcome for the farmer as well as for the climate.

I make the point again that we should be broadening the sources of income for agriculture in the future and encouraging farmers to think of carbon as a crop. That is a term that I use a lot, and that is exactly how we should think about it.

Claudia Beamish: Much of what I was going to ask about has already been explored and described in detail. We heard an interesting comment last week, from Dr Rachel Howell of the University of Edinburgh, highlighting the importance of changing norms as a strong influence on—[*Inaudible*.]—and I wondered whether you are exploring that in the CCC.

Chris Stark: Yes, we are. This is probably the most exciting topic for us, given the uncertainty of it all. We are all rabbits in the headlights when it comes to the pandemic, but we will see big changes after this.

In all the modelling that we have done, we have not assumed big change, and we have been prudent about the kinds of change that will follow, except perhaps in aviation, where we are not expecting a return to the patterns of air travel that we had for several years, which is in line with the industry's own assessments. In every other area, however, we are projecting that things will return to trend. I do not expect that to be the outcome, but I cannot predict with confidence what will happen. If you were to really push me on it, I would say that the interesting stuff is about work and travel—whether there might be a shift in work patterns to a new norm whereby the present style of working is more accepted.

We have a behavioural scientist on the committee, and from the outset he said that the longer things continue in this way, the more we will normalise current forms of work and the less embarrassing it will be—to put it bluntly—to suggest the kind of virtual interaction that is now the norm and that will probably remain a part of how we work. That will have implications for travel patterns, especially for commuting. From my perspective, there is a glimmer of real optimism here. We might have a different way of working, which is sometimes referred to as the hybrid model, that holds within it the potential, at least, for much-reduced carbon emissions from commuting in the future.

I would like to see that happen, but there is the potential for it not to happen. We have seen some

anecdotal evidence that, in the spare time that people have had when they have not been commuting, they have been jumping in their cars and going on leisure trips to far-flung places. It is not obvious to me that everything is going to be tickety-boo and go to plan, but that is definitely something that I am interested in pursuing, so we will look at those things over the next few years.

Finlay Carson: The most recent emissions statistics are based on 2018, and they are used as the baseline for 2020. However, some unprecedented reductions have been assumed for the period from 2018 to 2020—electricity emissions dropping by 23 per cent, buildings emissions dropping by 23 per cent and, probably most surprising, transport emissions dropping by 26 per cent. We understand that, as you have just touched on, our movement patterns have been quite different because of the pandemic, but is it realistic to expect such significant reductions in emissions, particularly when all the trends have been heading in the wrong direction up to now?

Chris Stark: We spotted that, too, and it is difficult to say without the data. There will be an impact from Covid, but, as we have just discussed, it is difficult to predict. The two examples that I would pull out are the emissions from buildings and the emissions from transport, both of which seem to be a quarter lower in those assessments. That does seem heroic, especially given the tendency to move to more car use during the pandemic. We have not been able to use public transport as much, for health reasons, so we have been using our cars more, although we have been travelling less because of the lockdown. The big one is the extra heating requirement in homes. I am speaking from a home that would not otherwise be warm, as I would not have the heating on. I am afraid that I will have to withhold a view for now, except to say that the figures look pretty heroic.

Finlay Carson: That is useful. Is there a reason why emissions from buildings and transport would plateau? We appreciate that there will be advances in technology and that we will see electric or hydrogen vehicles or whatever, as well as, potentially, improvements in the use of timber in buildings and improvements in heating and so on, but why would emissions plateau towards to the end of the CCPU period, and what are the implications of that?

Chris Stark: That is another thing that we spotted. I find that question more interesting than the previous question, because it will be difficult to answer for a couple of years.

It is an oddity. It appears that we will get a strange cessation of emissions reductions in the building sector after 2028, for example. That line falls sharply to 2029, then it is straight after that, and it is difficult to see why that would be the case. It indicates to me that that is a function of the TIMES modelling in that we are not modelling those emissions beyond a certain point. If we are seeing such emissions reductions prior to 2029, why would we assume that they would stop? I assume that those reductions would be the result of the policies that are in place and that we would not remove them at the end of the 2020s, so it may be that there will be greater potential to do more after that.

After 2028, the negative emissions will kick in, and Scottish TIMES—if it is a modelling issue—seems to be saying that no houses are going to be retrofitted after 2029; instead, we will use negative emissions, because they are cheaper. However, that does not stand to reason. I would like to see more information on how the modelling has been done and, crucially, on what the policies are seeking to achieve. My general criticism of the plan is that it is not possible to open it up and look at those things, so we will have to probe those issues with the analysts and officials after this meeting.

Finlay Carson: Is there a failure in the plan being too reliant on TIMES outputs? Is there a question about whether the information that we get from TIMES is valid or fit for purpose? Right through this evidence session and in previous sessions, questions have come up about whether TIMES is fit for purpose, and what you have said suggests that it is not.

11:45

Chris Stark: For me, TIMES has always been advisory. You cannot put ministers in a room with a TIMES model and lock the door until they fight it out. Ultimately, there must be an element of political judgment, and politics has an important role here.

We do not use energy system models such as TIMES as the foremost part of our armoury—we do not use TIMES, but we use something similar. We have a set of bottom-up scenarios in each of the sectors. Over the past 10 years and more, the CCC has developed a rich understanding of the opportunities to cut emissions in each of the sectors. We need something that allows us to understand how those cuts can be achieved in an integrated way, and we use TIMES or another energy system model as a check on that. I would like to see that happen in Scotland, too. We should have a bottom-up understanding of the opportunities.

It is worth saying that we have more and more of that in the draft updated plan. There is more evidence of that happening now in, for example, the transport sector and even in the agriculture

sector, albeit that I am very critical of the fact that we do not have the policies in place yet. We now have more understanding of those bottom-up scenarios, so we should be using TIMES as a check on whether we can do something in an integrated way rather than as a predictive tool. Again, it is difficult for me to know how this is worked out, but it appears that we have been using TIMES more proactively than I would suggest is sensible.

The Convener: We move to questions from Mark Ruskell.

Mark Ruskell: Let us wind us back to the issues of negative emissions technologies and CCS. The draft updated plan shows that there is real ambition in that area, such as in the target to sequester 24 per cent of gross emissions by 2032. What are your reflections on the risks and uncertainties and on who controls that? The Government has put a substantial amount of seedcorn money, as it is being described, into CCS development and innovation, but is there a lot of reliance on corporations and the oil and gas sector to control the pace of the development of those technologies? I am interested on your thoughts on that. Are there alternatives? If we were to put a sizeable amount of public and private investment into climate change mitigation, would CCS be it, or are there more cost-effective investment routes for solutions?

Chris Stark: Those questions are at the heart of the challenge that we have been talking about this morning. It might be worth saying something about the quantum. The amount that is required in the draft update to the plan is almost 6 megatonnes of negative emissions by 2032. In our assessment, that is right on the edge of what we think is possible. As I mentioned, we wrote to Roseanna Cunningham at the end of last year. From what we could scrape up, an earlier start to some of the engineered greenhouse gas removals that are set out in our assessments might give you 3 megatonnes. However, that would involve bringing forward to the late 2020s some of the bioenergy with CCS that we have talked about. In our assessments, that would be done in the 2030s, but doing that early might give you 3 megatonnes of that 6 megatonnes.

Starting to decarbonise Grangemouth early is one of the options, and that might elicit a further 2 megatonnes. Those two things together would give you 5 megatonnes, which is not enough, so we are right on the edge of what we think is possible through negative emissions technologies. I note—as, I am sure, the committee has noted—that Grangemouth does not seem very keen on that idea generally. Therefore, getting the cluster of industries at Grangemouth to engage in carbon capture as an issue and then, in time, achieving negative emissions seems like an uphill task. I understand that, because the market mechanisms are not being put in place yet by the Whitehall ministries that are considering them.

The scale of negative emissions that is being projected by the end of this decade is a tough ask, and you will need to see most of that UK policy being hoovered up in Scotland, if I may put it that way. Most of the beneficiaries of the UK policies that are being constructed and that were promised in the recent energy white paper will need to be in Scotland for many of those policies to work. That sets up the interesting question of whether there can be a competition within the UK for the recipients of the rewards from those policies and whether most of those can be in Scotland. There is big competition for some of those changes in places such as Teesside.

That points to a weakness in the plan in that there may be an over-reliance on those negative emissions technologies. I would love to see them come through—they could become a big industry for Scotland, and it would be great to see that happen, but scaling up negative emissions technologies might not happen at the required pace. We need to believe that everything will be in place to make it work on time, but that is at the edge of what is being planned in London now.

We have looked at some alternatives. We talked about investing more in nature or using more wood in construction. Those things are important. You could grow a bioenergy crop or a tree. It could be used in an energy process or you could let it grow, which would not give you an industry benefit but would still provide carbon sequestration. We could do more forestry. We have been talking a lot in the CCC about using wood more frequently in construction. We know from the history of houses and buildings in the UK that that is a good way of storing carbon for 100 years or more. Using more wood might give us more opportunity to store carbon in the built environment, but that would still create a reduction of less than 1 megatonne.

There is a big, unanswered question about whether we can meet a target on that scale. It is not clear what the alternative would be if we could not achieve that. We would have a very difficult journey to 2030.

Mark Ruskell: In an ideal world we would have 100 per cent blue hydrogen and we would be able to put that into the gas grid. We could decarbonise heating and install CCS. That would be great. Are there uncertainties about that? Are you confident that the oil and gas sector's strategies will mesh with the ambition that is needed to meet targets for 2030 and beyond?

Chris Stark: The strategy that you laid out is not one that we would propose. There are a lot of

risks, not least with carbon capture, which is not a 100 per cent process. All the carbon from natural gas cannot be captured by putting it through that process. You have probably heard about methane reformation in capturing carbon. There is a high yield and a lot of carbon can be captured but not all of it, so hard work has to be done somewhere else to set off the residual carbon.

In our most recent assessment, we came to quite a sophisticated view of how the UK could make the transition. It would start with a lot of production of blue hydrogen, but over time, as we had more supplies of renewable electricity—especially from offshore wind—there would be times when we would have an excess of supply over demand for electricity and we would be able to switch to storing that electricity in an alternative form, as hydrogen. That is a 100 per cent process; it is completely zero carbon. The future economy would support that better.

It is worth starting on blue carbon, because we could build the demand for hydrogen alongside the supply. Over time, we could switch to producing what we call green hydrogen. That would be a good strategy for Scotland. We would establish a low-carbon industrial base—probably at Grangemouth, but possibly in Peterhead or somewhere else—that would stand the test of time as we make that transition.

I do not have a view on whether the oil and gas sector is capable of delivering that outcome. The modelling that we have done points to it being a sensible plan for industry, for hydrogen production and for the production of green hydrogen once we have the extent of renewable supply that we have predicted.

Mark Ruskell: There is a lot of dependence on BECCS in the plan. Can the need for biomass be met from our domestic supply chain, or will we have to start importing forests from overseas and burning them to produce electricity?

Chris Stark: There is definitely a view that we could have an indigenous supply of biomass and manage that sustainably with all the other uses that we have for land. We have made an assessment at UK level. We have not done that for Scotland, but Scotland has even greater potential to grow that biomass. There is plenty of scope for that. In fact, in our latest UK-wide assessments we looked more broadly at diet change—not just red meat consumption, but meat consumption in the round—and they show spare land freed up, which could be turned over to other uses that might include things such as rewilding. That includes the biomass supply that we need in the projections that we have made out to 2045.

Mark Ruskell: Thank you.

Claudia Beamish: Earlier today, Professor Austin highlighted opportunities in relation to blue carbon; in particular the possibility was mentioned that salt marshes could present for carbon sequestration fairly quickly. Can you share with us any of your thoughts on the UK emissions inventory, how quickly we can move on the issue of blue carbon and where we are going on that?

Chris Stark: It has been a long-running theme of my appearances at the committee that I do not have those numbers, and I am shame-faced every time that we talk about it. We still do not have the figures, but I am happy to say that work is now in train that will enable us to start to consider blue carbon properly. I think that it has potential—albeit a niche potential—to bolster the efforts that we have been talking about more generally with regard to changes in the natural environment and land use.

I hope that we will soon have a piece of work that can throw more light on the blue carbon opportunity that exists, because it is clearly there. However, I do not have more to say about it yet. I look forward to the day that I can come to the committee and talk in detail about blue carbon and the policies that we will need to support it.

Claudia Beamish: That is what happened with peatlands. To be frank, things seem to be moving quite slowly with blue carbon. We look forward to that work.

Chris Stark: Me too.

Angus MacDonald: Our sister committee, the Economy, Energy and Fair Work Committee, has covered industrial decarbonisation in detail, but I would like to explore the issue a wee bit further. We know that emissions in the industry sector have fallen by 45 per cent since 1990, but much of that has been due to the disappearance of some major polluting industries. We also know that the draft CCPU aims for a 43 per cent reduction in industrial emissions between 2018 and 2032, which is considerably more than the 21 per cent reduction that was set out in the 2018 climate change plan.

A number of funds to support decarbonisation have been announced. How should industrial decarbonisation be supported so that risks and rewards can be shared and balanced among industry, Government and consumers? Will the funds that have recently been announced be adequate to ensure the necessary investment?

Chris Stark: There has been a remarkable change in the political climate when it comes to decarbonisation and climate policies. If the committee had asked me just a couple years ago what was happening with industry emissions, I would have given a fairly despairing answer. We have seen a massive shift in attitude, and it is

difficult to say why that has happened. I suspect that it is because there has been a change of tune in the Treasury with regard to some of these issues. There is an acceptance that we need to decarbonise the economy more fundamentally and that that will include the steps that need to be taken to decarbonise British industry. An astonishing amount of work on policy is being done to focus on the challenge of industrial decarbonisation.

The CCC has done more on industry decarbonisation, and we have definitely changed our tune on it. In the past couple of years, we have moved from thinking of it as a sort of hard-to-treat sector to thinking that there are lots of opportunities to decarbonise industry fairly quickly in manufacturing, construction and fuel supply.

One condition that we have looked at is asset replacement cycles. Assets tend to be long lived in those sectors, so we have to tackle that early because, when it comes to investing in a new piece of plant or machinery, the conditions need to be right so that the business invests in a zero-carbon piece of plant or machinery as soon as the old piece of high-carbon machinery is ready to be replaced.

12:00

We have moved to thinking that there is a huge opportunity here. Five years ago, we were talking about emissions reductions in 2030, but the latest assessment that we have made has a big shift in what we think we can achieve in 2030 across the economy. A large proportion of that change in our 2030 outlook—something of the order of 40 per cent—is due to industry emissions. We think that there is much more capacity to do more there, through two main strategies—one is what we call fuel switching, which means moving from a fossil fuel to an alternative such as electricity or hydrogen, and the other is carbon capture. Happily, the strategy that the UK Government is coming up with plans to cover those things.

A host of things will come from what has been promised in the recent energy white paper. There is a long list of things that look like new funding mechanisms, new market models, a new emissions trading scheme and operation across the UK post-Brexit, and a real focus on industry decarbonisation. That makes me pretty optimistic at the moment, although I have not seen the detail. I am optimistic that we will have a substantive strategy for industrial decarbonisation, from which Scotland should benefit, as long as the commercial operators are willing to make those investments and benefit from those policies.

There is such a big unanswered question. A few days ago, I noted the coverage of Ineos and its willingness to speak to the Scottish Parliament about those issues. We will need to see Ineos and the other commercial operators at Grangemouth—it is not just Grangemouth, but let us talk about Grangemouth for the moment—being interested in decarbonising in a way that they are not demonstrating at the moment. The policies need to do a lot of gingering up of that commercial interest and they are not doing that yet. We will also need to see much better co-operation between officials in Scotland who are working on policies for industry decarbonisation and officials at Whitehall. We do not see much of that at the moment either.

I would love to see us talking about this as an opportunity for Scotland in a way that we are not doing at the moment. There is still a kind of feeling around that this is a problem to be managed rather than an opportunity for Scottish industry.

Angus MacDonald: As you said, the largest single geographical source of emissions in Scotland sits in my constituency of Falkirk East. The cluster of industry in and around Grangemouth accounts for more than 30 per cent of our industrial emissions.

Ineos would argue that it does engage, although I was critical of the fact that its representatives refused to appear in front of Parliament to give evidence, or even to give a written submission. Falkirk Council would also argue with Ineos that it is actively engaging with the Scottish Government and working in conjunction on the investment zone and carbon capture and utilisation schemes.

Although Scotland has significant advantages in engineering expertise and geological storage for CCS, I am led to believe that there is also competition from Teesside and Humberside. How can Scotland capture the economic and just transition benefits? How do we compete with Humberside and Teesside?

Chris Stark: We have to start with ambition, and we certainly have that in the climate change plan update. It hopes that we will capture 40 per cent of the total storage element projected by the entire CO_2 European management market. That is ambition. If we can pull that off, it will mean a huge new market for Scotland to address.

To go back to the premise of your question, we will need Ineos and other commercial operators that are presently in the oil and gas sector to view CCS as an opportunity in that way. I think that we can do that, but there is the additional factor of competition within the UK; that is a real factor, especially the Teesside competition. In our assessments, and in the recent UK Government energy white paper, we expect to see only one, or possibly two, industrial sites developed and operational for carbon capture and storage in the

next decade, although there will be more after that.

Again, this is an area in which the Scottish Government needs to lean in, if I can use that term. I hope that it is discussing with its Whitehall colleagues the options on how to capture the lion's share of that planned support.

The plan update calculates that if we got 40 per cent of the European CO_2 storage market, that would create more than 100,000 jobs in the CCS market. It would be a great prize for Scotland if we could pull that off, and there is a huge amount of engineering expertise in Scotland, which will help. CCS is a big part of our assessment, because of the optionality that it creates in relation to further decarbonisation and because of the jobs that go with it, which is a crucial point. Scotland really should specialise in CCS. Ultimately, much rests on that happy union of Scottish and London politics and commercial interests.

Angus MacDonald: There are massive opportunities there.

What will be the implications for Scotland's economy and a just transition if the industrial sector is slow to decarbonise? How can the Scottish Government better engage with the sector to ensure that all the potential benefits are captured?

Chris Stark: In the context of a just transition, oil and gas is one of the issues that the UK faces but it is not top of the pile, whereas it is massive for Scotland, because we have such concentrated employment in the sector and it has been such a big part of the Scottish economy's success over the past 30 or 40 years. Scotland really needs to grab the opportunity to decarbonise industry through carbon capture, because that will aid immensely the story of how we move jobs from the high-carbon oil and gas industries to something else.

There are risks if we do not do that in Scotland and act too slowly. Another area might decarbonise faster, so jobs might move elsewhere and there will be a difficult-to-manage impact on places such as Aberdeen, where there is a high concentration of jobs in the oil and gas sector. The biggest concern for me is that there will be competitive job creation outside Scotland entirely, so employment will be entirely lost to another country or part of the UK. That would be a big part of an unsuccessful transition.

Going early on industrial emissions is critical to a successful transition, in the round. Scotland is doing a good thing in having a just transition commission—the commission is chaired by Jim Skea, who used to be on my committee—to look at these issues. I do not know what the commission will conclude but I would be surprised if it did not say that Scotland needs to focus on the issue as a priority.

Angus MacDonald: Okay. That is helpful.

Claudia Beamish: I want to broaden out the discussion by highlighting the just transition commission's advice on a range of sectors, which I think is helpful and robust in offering protection for workers, businesses and communities. For example, the commission talked about retrofitting homes, developing buses and making manufacturing greener. Do you think that the advice is robustly embedded in the updated plan? If so, how will it be realised?

Chris Stark: I think that it is. I made the point about the need for an integrated set of plans; the progress that I see in the update tells me that the Scottish Government is thinking in a more integrated way about the changes ahead. There is acceptance of some advice that we offered earlier in the pandemic, last summer, about the priorities for a resilient recovery. The Scottish Government has been notable in accepting those recommendations and building them into some of the steps that it has taken during the crisis of the pandemic and its impact on the economy.

I see glimmers of a hopeful strategy when it comes to a just transition with a focus on employment. Of course, in the CCC we are less focused on such things because we are driven more by carbon—we bring those issues in for our assessments but they are not so fundamental to the work that we do. We have pointed out that there are huge employment opportunities in some of the new low-carbon sectors. You mentioned one of them: the building retrofits programme, which could create 200,000 new jobs or more. Again, those are UK-wide figures.

Even if Scotland got only 8 or 10 per cent of those jobs, that would represent a significant new employment boom, and the advantages of that would be spread geographically across the country. Every city and town—every village, for that matter—needs to make those retrofit improvements to bring really good benefits to people living in homes and buildings across the country. That is an area in which Scotland can excel, and I look forward to the Scottish ministers' imminent publication of the heat in buildings strategy, which will—I hope—say more about how that particular priority will be supported and what the employment and skills retraining opportunities will look like.

Mark Ruskell: You have said quite a bit about behaviour change, and you mentioned some of the approaches in the public engagement strategy. I want to focus on the infrastructure investment plan. In your view, are we are investing enough in low-carbon infrastructure to create the system

change that will enable people to more easily tackle climate change? Have we got that right yet? Is there enough ambition in the plan? Are we nudging people in the right direction or not?

Chris Stark: I have spoken a bit about that. The engagement plan that was published alongside the update is great, and I am very pleased to see it.

I have not made a full assessment of Scottish infrastructure plans, but I know that there has been a lot of coverage of the fact that not all the infrastructure plans are what we might think of as zero carbon. A lot of that is because of the road-building programme, and I cannot get too excited about that. The general point that runs through all this, which I raised earlier, is that not everything needs to be about climate change.

On behaviour change, we need a set of changes across society. I have mentioned a few times in evidence to Parliament that I do not like the term "behaviour change" because it implies poor behaviour. We need to move people towards a set of positive changes in society that have the happy benefit of cutting emissions as well. That involves a more complicated discussion about what the motivating factors are.

I am less interested in the overall focus of the infrastructure strategy. We need new roads—I understand that; there is a wider set of circumstances that has led to those priorities. I would love us to focus on breaking down the climate strategy into different sets of motivating factors in each sector so that we understand better what will encourage people to make the transition to low-carbon transport, for example, or to invest, as consumers, in alterations to decarbonise their homes and make them less draughty. Those things do not necessarily all have to be about climate change; we need to focus on the wider issues too.

Stewart Stevenson: To what extent are the six principles for a green recovery that the Committee on Climate Change has put forward reflected in the update? On a related point—I will get it all out at once—will the plan get support if it is part of creating new employment? You talked about 100,000 jobs, in a slightly different context.

Chris Stark: It is notable how far the six principles for a green resilient recovery that we passed to the Cabinet Secretary for Environment, Climate Change and Land Reform have been adopted by the Scottish Government. From my perspective, that is great.

It is worth saying what those principles are. We talked about investing in low-carbon and climate resilient infrastructure; reskilling and retraining; research for net zero; upgrades to homes; action to make it easier for people to walk, cycle and work remotely; and tree planting in peatland. The Scottish ministers have definitely responded to those points, as we can see from the actions that we have had from the Scottish Government to date. Those principles have been a much more fundamental part of the recovery plan than we have seen in other parts of the UK, and it is to the credit of the Scottish ministers that they have managed to do that.

We could talk about whether that is sufficient and, of course, I would tell the committee that it is not; we can always do more in that regard. Those are the right themes, but even better responses could be framed to the economic crisis that we now face as we come out of the pandemic, in such a way that we get the green recovery that we have talked about.

12:15

If I could point ministers in a certain direction, it would be to think more about investment generally. In the work that we have done most recently on Scotland's journey to net zero, we considered the total capital expenditure that is required to deliver that, and it is largely a question of capital investment.

The assets that we will use in the future happen to use less fossil fuel and will drive us to net zero. They require capex—capital investment—across the economy, the majority of which is private. Of the order of £5 billion to £6 billion needs to be invested each year in Scotland. We are not investing that now, so we will need to scale up to that over the course of the decade ahead, but that will have an appreciable impact on gross domestic product, especially with spare capacity in the economy.

Rather than using scarce resources for that challenge, given that we now have the resources spare, it makes a huge amount of sense to prioritise those investments that will lead us to net zero, especially in the transport and building sectors and in industry, and to do that as quickly as possible.

We have done some work on the econometrics with Cambridge Econometrics, focusing on the potential GDP impacts of that sort of investment programme over the next 10 years and beyond. We can see a notable uptick in GDP of possibly 2 to 3 per cent, if we are investing at that kind of scale, over the next decade. Suddenly we are getting into an interesting discussion: it is not really a climate investment strategy; it is a straightforward economic recovery plan. I would like to see more of a focus on capex and capital investment.

The Convener: You alluded to the fact that the climate change plan update takes a more

integrated approach across Government portfolios, and I want to pursue you a bit more on that.

The committee has repeatedly made the point over the past few years that there needs to be less of a silo mentality in Government. The challenge can be met only if the actions are delivered across all Government portfolios and in every section of Scottish society. Could you give an assessment of where you think that that has improved and where it still needs to improve?

Chris Stark: It would be easy for me to say something that sounds glib—for instance, that net zero needs to run through all the policies that we make—but that really is the approach that will deliver the outcome that we need to achieve. I have said in other forums that this work needs to be like the letters running through a stick of rock: it must run through all the work that happens across Government. There is no policy area that does not have some relationship with emissions and the challenge of reducing them, even things that we may think of as far-flung, such as health policy. There is still a link.

Reducing emissions needs to be fundamental to how we approach policy making in the round in Scotland and across the UK. There are indeed clues that that is happening. The fact that every cabinet secretary signed the update to the climate change plan is a clue that there has been a proper discussion at Cabinet level, despite the fact that we are in a pandemic. That seems to be great progress.

The Scottish model of Government that has developed over the past 15 to 20 years helps with that. Yes, it is siloed—and I can tell you from experience how siloed it is—but it is not as siloed as Westminster. Here, there is still at least the idea that the cabinet secretaries receive advice from a range of officials who need not solely be in their domain, portfolio or department, as it would be referred to in Whitehall. That more integrated approach can help.

The fact that we cannot say for certain how the policies in the update to the plan are contributing to achieving the 2030 target and net zero by 2045 is the biggest problem. We have had more integration of policy discussion than ever before, and we clearly have a good integrated set of models for the assessment for carbon, but I cannot tell you what contribution each portfolio is making to the overall challenge, except by reference to the set of numbers in annex C to the update to the plan. I am afraid that I do not know whether those numbers are delivered by the policies contained in the update or to what degree they are an undershoot.

For me, that is the bit that is missing. Let us have an open discussion about the extent to which we are on course to deliver the emissions reductions. It is perfectly acceptable for there to be a plan that does not deliver entirely on the statutory targets at this stage. Let us understand what the gap is and what we need to do to plug it.

The Convener: Our scrutiny as a Parliament will be fundamentally important to that. We need to be asking the right questions, not only in this committee but across all the others as well. Obviously, we are asking for your opinion. As a committee, we feel that more attention needs to be given to emissions reduction across different portfolios, but each committee has its priorities and they might not all see net zero as their job. How would you convince them that it is, in fact, everyone's job?

Chris Stark: Although we have done a little bit of work on governance in the CCC, I am very much expressing a personal opinion here, which I do not mind doing. It is great that the Scottish Parliament has various committees scrutinising the plan. That is clearly progress, as we have not had that in the past. Nonetheless, I still feel that it is difficult for your committee to do that well. I certainly think that having a committee in Holyrood that looked specifically at the net zero challenge would really help. That would mirror how the Cabinet in Scotland has been thinking about it.

That pressure is also building in Westminster. There is more of an apparatus in the UK Government, because there is a net zero focused or climate focused set of committees looking at the matter for the UK Cabinet. We already have that apparatus in the Scottish Government and I would like to see the Scottish Parliament get ahead of Westminster by establishing more of a focus on net zero in general and having a single committee that can call for evidence from across the sectors to allow it to do that.

Although I know how difficult that would be, it would help immensely with the scrutiny process, because some of the divides are artificial. For example, the fact that the Rural Economy and Connectivity Committee wants to talk to me about agriculture but not about changes in land use is a problem. We get a divide in the way that the scrutiny is done and, naturally, it would be better to be more integrated in the scrutiny as well as in the assessment that we make. We could provide more clarity if we were speaking to a committee that was as steeped in the issues as ministers are and as the CCC is.

Mark Ruskell: Those are really interesting points for the next Parliament to consider.

I want to ask you about Environmental Standards Scotland, because we now have a kind

of partial replacement for the European Commission. You will have been aware of the debate during the progress of the UK Withdrawal from the European Union (Continuity) (Scotland) Bill about ESS's role in relation to climate change. Have you spoken to the new interim body? Are you working out a way of working that can enhance parliamentary scrutiny of the climate change issue?

Chris Stark: No. I have not spoken to it yet, but I have had various discussions with officials about the set-up. A parallel discussion is happening with the Office for Environmental Protection, which is the mirror body at England level. There are similar discussions about the involvement of the OEP in the climate targets. I am pretty relaxed about it. From my perspective, we are here to offer a service to the Parliament and to the public bodies that are there to work on the environment. Of course, the change after Brexit is enormous; when it comes to oversight, scrutiny and regulation of the environment after Brexit, we are not even at the races in understanding how that will work. The UK Environment Bill has been postponed, so we are in a bit of a hiatus, which is deeply problematic from my perspective.

The CCC is on a list of issues to be resolved, but I would say that we are pretty far down that list. I am confident that we can integrate our work with whoever is providing the regulatory oversight, as long as we are not conflicted in offering our advice freely on the progress that needs to be made on Scottish emissions and, indeed, on responding to climate change itself. That is probably a more problematic overlap, if it is not resolved properly, because the environment itself will be impacted by climate change and we also offer assessments of how that will happen. Almost every bit of environmental policy has to accommodate that change in the climate. However, as long as we are in the position of being the advisory body and offering that advice freely, and as long as it is being used by whichever public body comes into that regulatory role, I am confident that we can make that work.

The Convener: The final question is from Finlay Carson.

Finlay Carson: We have discussed a lot of issues today. One thing that I have picked up is that we have what you describe as potentially unrealistic expectations for reductions in emissions in some sectors, such as transport, buildings, agriculture and electricity. We also have some gaps, which could be because the TIMES model does not address the issue properly. You have suggested that there is an overreliance on negative emissions targets, which could simply be to balance the books. How could the Government improve the layout of the climate change update, in which there are lots of unqualified assumptions, to make it easier for us to scrutinise what the plans actually are?

Chris Stark: I certainly have some thoughts on that. The first thing to say is that I understand the many challenges—and identify with those who have faced them—of pulling together such a plan in an effective way so that people can do the scrutiny and understand what is coming. However, it seems that there is a deficiency, in that there is a gap between what is promised in the numbers and the modelling exercise and what is promised in the policies.

I certainly look at the numbers and think, "Wow! Some amazing decisions have been taken about how to allocate effort across the economy." You mentioned buildings, on which the plan sets out double the cuts in emissions that we project by the end of the decade. The assumption on negative emissions, which are mostly in the power sector, looks pretty bold. I can see that in the numbers and I can do a job on that. However, what I cannot do—I suspect that this is what committee members are struggling with—is understand whether the policies and proposals in the update to the plan deliver those outcomes, or to what degree there is a gap.

That is what I would like to be addressed. Let us have an unqualified and open discussion about the extent to which the policies are expected to deliver emissions reduction. It is okay for there to be a gap, because we can continue to look at and probe that but, at the moment, it is almost as if that issue has been ducked entirely. I would like to see a better plan that explores better the effort overall that is being expected and delivered through policies.

The Convener: That brings us to the end of our questions. Before we let you go, is there anything that you want to add that we perhaps have not covered and that you would like to leave us with?

Chris Stark: Thank you so much for the opportunity to speak to you. I have a few things to say.

A previous Scottish Government programme for government committed to the idea of establishing more of a presence for the CCC in Scotland, to allow us to do more active consideration of Scottish issues and policies. I would love to do that. We have not yet seen anything from the Scottish ministers that helps me to understand whether that office for the CCC can be set up.

I am in Scotland today and of course I am aware of the issues, partly because of my history of working in the Scottish Government. However, a future chief executive might not be in that position. I have no plans to leave, incidentally, but at some point the conditions will change. The discussion of

policy in Scotland is now very distinct from that at Westminster. It would be great if we could support that better with more support from the Scottish Government through the funding that we receive to do our job. I just put that on the record, because it is still my ambition that we establish an office for Scotland.

In general, a lot more scrutiny will be required from the CCC as the plans take shape and, crucially, after the imminent parliamentary elections for Holyrood. I expect that we will want to talk more about that issue in future.

The Convener: Thank you very much for giving us your time today. That takes us to the end of our panel discussions and our public meeting.

At our next meeting, on 9 February, the committee will conclude taking evidence on the updated climate change plan with the Cabinet Secretary for Environment, Climate Change and Land Reform, Roseanna Cunningham. The committee will also hear from the cabinet secretary on the Scottish Government budget, for which Ms Cunningham will be joined by the Cabinet Secretary for Finance, Kate Forbes.

12:29

Meeting continued in private until 12:54.

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