OFFICIAL REPORT
AITHISG OIFIGEIL

Net Zero, Energy and Transport Committee

Tuesday 21 December 2021

Session 6

The Scottish Parliament
Pàrlamaid na h-Alba

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NET ZERO, ENERGY AND TRANSPORT COMMITTEE
0th Meeting 2021, Session 6

CONVENER

*Dean Lockhart (Mid Scotland and Fife) (Con)

DEPUTY CONVENER

*Fiona Hyslop (Linlithgow) (SNP)

COMMITTEE MEMBERS

Natalie Don (Renfrewshire North and West) (SNP)
*Jackie Dunbar (Aberdeen Donside) (SNP)
*Liam Kerr (North East Scotland) (Con)
*Monica Lennon (Central Scotland) (Lab)
*Mark Ruskell (Mid Scotland and Fife) (Green)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Professor Keith Bell (Climate Change Committee)
Chris Stark (Climate Change Committee)
Collette Stevenson (East Kilbride) (SNP) (Committee Substitute)

CLERK TO THE COMMITTEE

Peter McGrath

LOCATION

Virtual Meeting

Scottish Parliament

Net Zero, Energy and Transport Committee

Tuesday 21 December 2021

[The Convener opened the meeting at 10:00]

Decision on Taking Business in Private

The Convener (Dean Lockhart): Good morning, and welcome to the 15th meeting in 2021 of the Net Zero, Energy and Transport Committee. The meeting this week will be conducted remotely. We have received apologies from Natalie Don, and Collette Stevenson is once again attending as committee substitute.

Agenda item 1 is a decision on taking business in private. Does the committee agree to take in private item 3, which is consideration of the evidence that we will hear this morning, and item 4, which is consideration of the committee's work programme?

Members *indicated agreement.*

Climate Change Committee (Annual Progress Report)

10:01

The Convener: Our main business this morning is agenda item 2, which is an evidence-taking session with the United Kingdom Climate Change Committee on its 10th annual progress report to the Scottish Parliament.

The report, which was published on 7 December, is required under the Climate Change (Scotland) Act 2009. It presents 70 key recommendations to support Scotland's transition to net zero and highlights that the focus in Scotland must now be on

"ensuring that rapid emissions reductions are delivered ... to allow Scotland to meet its legislated 2030 target."

To discuss the report, I welcome to the meeting Chris Stark, chief executive, and Professor Keith Bell, Scottish member, Climate Change Committee. Thank you for accepting our invitation to attend this morning's meeting and for your on-going support to the Scottish Parliament.

Mr Stark, I understand that you would like to make a short opening statement, so I will pass over to you. Your microphone will be enabled by broadcasting staff.

Chris Stark (Climate Change Committee): Thank you convener. It is good to see you all this morning. I am sorry that we have to do this remotely but, sadly, we are where we are.

This is the 10th assessment that we have offered of the Scottish Government's efforts to cut greenhouse gas emissions under the 2009 act, and I am very privileged to be able to continue to provide that service to the Scottish Parliament. Keith Bell and I are with you today, and we will say just a few opening words to set the scene for the report.

Over the years that we have been providing these reports, we have tended to be fairly generous in our assessments of Scottish ministers' climate plans. Around the table at the CCC, we always have a choice about how we describe the state of play and, crucially, about the degree of optimism that we should bring to any chances of future success. In general, we want to try to encourage and highlight the positives, and I do not mind saying that it has always been quite useful to be able to point to the Scottish plans as a spur to other parts of the UK to do similar things.

However, members might have noticed a change of tone in this assessment. That is deliberate. The Scottish Parliament elections this year returned a different sort of Government—one

that contained the Greens and the Scottish National Party—and this is the first time that we have felt that we needed to offer such clear criticism of the state of play of climate policy in Scotland. I just wanted to mention that, because it is not that I or the committee feel that there has been a change in the political commitment to Scotland's climate plans but that we are running out of time to turn ministers' great promises into a real-world change.

I am afraid that that is the reality of the situation that Scotland now faces under the current climate legislation. This is the parliamentary session that will really matter, and this is the Parliament that will, I suppose, have to change the weather with regard to the state of play on climate policy. The next parliamentary session will be too late. As we say in several places in the report, Scotland took 30 years to halve its emissions, and it needs to halve them again in less than 10 years if we are to meet the 2030 target that the Parliament set for the country.

I have talked on record about how hard it is to meet that target. It was not on the path that we advised, and it is more ambitious than any scenario that we have yet created, but the time for questioning it from our perspective is over, because it is now law and it has to be met. At the moment, we have doubts that the target will be met, despite the raft of new policies and strategies that has come from the Scottish Government.

That is the serious point that I wanted to kick off with. All of this will potentially place the Scottish climate change target framework in jeopardy if things do not change, and in our view, most of the levers for making that change now lie with Scottish ministers. Even where they do not, there is a need to find ways of achieving consensus and co-operation with UK ministers to address that matter.

We have therefore made a conscious decision to be tougher in this report about where we need to see progress, but I just wanted to say at the top of the session that it is the numbers rather than any change in political commitment that have led us to change our tone.

The Convener: Many thanks, Chris. Your opening remarks set the scene well, and I am sure that members will have follow-up questions.

As you well know, one of the committee's main responsibilities is to scrutinise the implementation of Scottish Government policy in this area, and it would be very helpful if you could elaborate on some of the Climate Change Committee's observations on the clarity, transparency and detail of policy, which have been lacking. As you have just said, the credibility of the Scottish climate framework is now in jeopardy. A number of headline policy announcements in recent years might well fall into that category, and I am thinking in particular of the announcement of the publicly owned energy company that did not materialise and the public energy agency, which we understand will have only a virtual presence. Moreover, there is concern over the lack of detail in the heat in buildings strategy and the absence of plans surrounding the target to reduce car miles by 20 per cent. Are these the types of policy announcements that you are concerned about with regard to the need for more detail, more specific targets and better implementation? You also raise in the report the critical question of how all of this is going to be financed.

Chris Stark: Keith Bell might want to come in after I make a few opening comments, but they are the types of things that we are concerned about. Broadly speaking, I think that what we have seen in various statements from the Scottish Government—by which I mean the climate change plan update, the programme for government and possibly its most recent draft budget—is a collection of policies, proposals and commitments that, when added up, amount to an incredibly ambitious programme. There is no doubt about that.

Since the publication of the climate change plan update, in particular, a collection of new policies has been announced, but we have not yet been able to match up the numbers with regard to emissions reductions or to understand how the various funding commitments that have been made are tied to those policy commitments. The hardest thing for us, given our statutory role of assessing progress, is that although the climate change plan update sets out a set of sectoral pathways for Scottish emissions across the various sectors of the Scottish economy and although you can see the intended path—which is incredibly ambitious, as it needs to be to meet the statutory targets that I mentioned in my opening statement—we cannot match all of that up with the policies themselves. In other words, we cannot quite see how a pathway will be delivered by the announced policies or whether the delivery of those policies is fully funded.

Furthermore, we know that a lot of this will have to be delivered by the private sector; in fact, we would say that the majority of the progress will have to come through private investment and through individuals and corporates making the decision to invest. It is not entirely clear how that process of change will take place through the policies that I have mentioned.

I am not saying that it cannot be done, and I genuinely admire the ambition of Scottish ministers in the various climate publications that we have seen. Indeed, the climate theme clearly runs through the recent Scottish budget. However,

it is not clear how the pathway for delivering the emissions targets that are now law in Scotland can be delivered through those policies.

I do not know whether Keith Bell wants to add anything.

Professor Keith Bell (Climate Change Committee): Good morning. I think that you are right—this is all about the level of detail with regard to delivery and achieving the promised outcomes. The intended outcomes are fantastic, and we absolutely welcome that level of ambition. The big question, though, is: how do we get from here to there?

As Chris Stark said, there has been a raft of consultations, but we still seem to be largely in that consultation space, rather than at the point of testing out the mechanisms for delivery and achieving outcomes. One of the good things is the greater detail that is now promised in, for example, our annual monitoring reports, which will enable us to achieve some of the oversight that Chris mentioned. However, if you look at the monitoring report now, you will see that, in many places, it says that the data is still to be collected, or that processes are still to be put in place to collect the data. Collecting the data is a boring activity. If you have to do it, you will not be very happy about it. However, it is absolutely crucial to understanding where we are and, as policies begin to be rolled out, whether they are having the impact that we need them to have. That is another illustration of the challenge of getting to the space of delivery.

The Convener: Chris Stark, you mentioned the vital need to finance all the policies. If you look at the heat in buildings strategy, it is clear that the majority of finance will have to come from the private sector. If there is concern over the credibility of the climate framework and policy framework in Scotland, does that lead to a concern that the ability to bring in the necessary huge amounts of private sector finance will also be in jeopardy?

Chris Stark: That is a legitimate criticism. If we talk about the challenge of reaching net zero, and step away from the immediate challenge of the 2030 targets, it is important to say that, in our assessment of Scotland's goal of reaching net zero, we have said that it is mainly an investment challenge. In effect, we are investing in capital assets across the economy in every sector; not only in new wind farms, but in new electric vehicles, heat pumps and plant and machinery in business. Those are the assets that we use presently that burn fossil fuels, which then creates the problem of climate change. Our investment involves turning over the capital stock of the economy to something that is zero carbon. It is a major challenge. Much of that investment will need to be led by the public sector, but most of it will involve investments made by individuals or by corporates, which, over time, will lead us to the goal of net zero.

For the UK, the number that we have put on it is between £50 billion and £60 billion of extra investment each year from about 2030 onwards. For Scotland, the number that we have put on it is between £5 billion and £6 billion. Those are the annual investment requirements to get us to net zero over the course of the next 25 years or so. As I mentioned, much of that will be led by private investment. Crucially—this is the important thing—the work that we and others have done says that there is no shortage of capital and finance out there to allow that to happen. However, we need a path for the wall of capital that is out there to reach the real world. That is about the policy mechanism—we need the policies that allow the finance to flow. Some of the investment will be made directly by the Government, such as the major infrastructure that we might put in place to decarbonise the rail system, but much of it will be made by individuals or by individual corporates.

As an example, if we think about the challenge of decarbonising heat, which the convener mentioned, the Scottish Government has a plan for that. It is talking about installing many hundreds of thousands of heat pumps, which is an electrical technology that allows us to decarbonise the supply of heat, over the course of the next 10, 15 or 20 years. Most of that will be done by individuals, but we have not yet quite understood what combination of regulations, support or even law will allow the finance to flow. I do not doubt that it can be done, but the challenge is to turn the plan into a set of policies that gives me confidence that it will happen.

From my perspective, the importance of the Climate Change (Scotland) Act 2009 is that it gives confidence to the whole collection of actors in the economy that we are on the journey, and that we will deliver. That is the importance of the statutory targets—they are not a guide; they are law. If everyone has confidence that the targets will be met, and if everyone understands that they have a set of roles to play in the process that will take place over the next 20 or 25 years, I am confident that it will be done in a way that is low cost to the economy, and achieves the goals that the 2009 act sets out.

If that framework is loosened—if we start to view these things as more signal than law—all the actors in that process that I have just described will start to have doubts. That is when the costs come in, because, to talk in raw finance terms, that is a cost of capital issue. As the risk increases, so does the cost of financing. It is important to say all that at the moment, because this is the decade in which we must make the big

progress to achieve all that. It really does matter that the overall costs of it will be kept low if we keep the risk of failing to meet those targets low as well.

10:15

The Convener: Yes, absolutely. The numbers that you mentioned for annual expenditure are massively significant. Before I bring in other members, I will follow that up with a brief question on another area. The committee is about to embark on a major inquiry into the role of local government and cross-sector partners in delivering net zero. I am sure that you have heard concerns expressed about whether local government has the necessary resources, budget and expertise to deliver everything that is being asked of it, especially in the context of the latest budget, where we have seen a real-terms decline in the local government settlement. That is in no way a criticism of local government, which has done a great job during the pandemic. However, its resources are stretched. Do you share the concerns about local government's capacity to deliver on all the fronts that it is required to?

Chris Stark: Yes, I share those concerns. "Capacity" is a good word. There are two challenges here: resources, which are typically a financial issue; and the capacity issue. Those are challenges, because what we are asking with regard to the grand design that we are trying to bring together for decarbonising a whole economy is a new set of requirements of local government. From my perspective, some of the most interesting challenges lie at that level. You could think about it this way: every village, town and city in Scotland must have a distinctive plan for decarbonising, because every village, town and city in Scotland is different. I am speaking to you today from my kitchen in Glasgow. All around me are the very distinctive Glasgow tenements—I am in one of them. A city such as Glasgow needs to have a distinctive plan for decarbonising, a plan for transport, and a plan for making these buildings more energy efficient. I could go on. The jobs involved in that will be distinctive as well.

It is really important that local government has some ownership of those issues and some agency to define that plan. That is primarily a capacity issue because, had we been talking about that five or 10 years ago, say, that is not the typical thing that we might have expected local government to do. To me, that is really exciting, because if local government has that agency and capacity, it is probably the key to unlocking a set of meaningful plans that will stick. However, if that capacity is not there and if the resources are not available—the resource question comes in now as well—it becomes hard to push that from the centre. The Scottish Government might well have a plan, but you will be pushing bits of string unless bits of government are ready for that. We have time to fix that, but it is important to say that local government has a very important role in that and needs to be helped and supported to build that capacity.

Professor Bell: May I add to that? I agree totally with everything that Chris Stark has said. That is not to say that local government has to do absolutely everything, but it has a really important role in reconciling different dimensions of the challenge and in co-ordinating and bringing other important actors together. Therefore, I am glad that your inquiry is not about local government only, but local government is a crucial glue, if you like, which, as Chris Stark was saying, takes account of those particular differences in different locations.

The Convener: Those are all issues that we will be exploring in that inquiry, which we will begin early in the new year.

I see that Mark Ruskell has a supplementary question, before I bring in Fiona Hyslop.

Mark Ruskell (Mid Scotland and Fife) (Green): Good morning. On the co-operation agreement between the Greens and the Government, in which areas has substantial progress been made, notwithstanding your comments about the fact that now is the time to build that delivery and ensure that we have the budgets and the detail for delivery? Are there particular themes on which progress is being made?

Chris Stark: I am happy to pick that up, although I am sure that Keith Bell will have his own views.

It is great that there is a Scottish Cabinet with a cabinet secretary for net zero and that there is a set of ministerial portfolios that are very clearly tied to the climate challenge and the transition to net zero. There are the Minister for Green Skills, Circular Economy and Biodiversity, which is a very important title, the Minister for Zero Carbon Buildings, Active Travel and Tenants' Rights and the Minister for Just Transition, Employment and Fair Work. That is a reflection of the change in priorities.

I thought carefully about what to say at the start of the meeting, because I do not want to remove my optimism from the discussion. I think that it is really good that those ministerial portfolios are in place and, from my perspective, it is very clear that that is already having an important impact. That is probably most obvious in the housing and transport spaces. There are now big packages of spending to decarbonise buildings in Scotland,

and priority is being given to things such as active travel for the first time. All of that is great.

The other thing that I will chuck into the mix—I am not sure whether this is a product of the SNP and Green agreement, but it is still worth commenting on—is the commendable focus that has been brought to the just or fair transition and the various aspects of that, but particularly workers and skills. I presume that that is because of the challenge in the oil and gas sector in Scotland. Scotland is now leading on a wider collection of issues, and I would like to see other parts of the UK following suit.

For me, all of that is pointing in a better direction. To go back to my opening comments, that now needs to be turned into real-world change on the ground, and the clock is ticking. I am afraid that we do not have another decade to think about the issue; we have to turn the approach into something that makes real-world progress on emissions in this year. For me, that is the challenge.

It is great to see the shift in focus and emphasis that has come about through the new ministerial positions, and I am sure that the arrangement between the Greens and the SNP will bear fruit, but it must do so very quickly.

Fiona Hyslop (Linlithgow) (SNP): It is good to see both of you. Thank you for joining us.

Given the risks to meeting the tough 75 per cent emissions reduction target by 2030, which was a cross-party, collective decision in the Scottish Parliament, in which sectors are rapid gains still feasible? What needs to change to deliver tangible reductions in those areas? I know that you set that out in detail in your recent report, but I am keen to hear from both of you about the focus and emphasis that you want to give the committee.

Chris Stark: That is a very good question, because we are already in the decade that will matter in determining whether we will meet the 2030 target, which will be really difficult. We have talked about that many times before, but I make the point again that the time for discussing and debating the target has passed, and the challenge now is to meet it.

The target will be tough to meet, because the flexibility that we have is not great. We already have a plan from the Scottish Government that effectively turns the dial up to 11 in a host of areas. There is not much scope to go faster on that plan in most areas.

The big issues that will matter include whether we can still capture some kind of emissions benefit from whatever remains of the pandemic impact. Looking post-pandemic, that probably means trying to reduce our road travel and potentially working from home as much as possible, and capturing the emissions benefit from that.

I am afraid that we have not heard very much at all from the Scottish ministers on whether we can suppress future growth in aviation demand. You could probably go further in a collection of transport areas.

The other area that we have highlighted is still a bit of a mystery to me, as you would expect. The advice that we have given was for a less strenuous target by 2030, and we see that the Scottish Government has gone ahead of the CCC's ambition by 2030 in most areas.

One area in which the Scottish Government has not done that is industry, so there might be scope to raise ambitions further on industrial emissions. A lot of that area—particularly some of the energy policies that will matter for industry—falls under UK-wide policy making, but I still think that there is scope to do more. The committee might want to look further into that.

Professor Bell: It is all a big challenge. Chris has watched "This is Spinal Tap" a few times, so he talks about turning everything up to 11. However, things take time.

We are a little bit behind the curve on defining the mechanisms that would give confidence in relation to the investment that Chris mentioned. For example, when we consider changing heating systems in buildings, one positive that we should recognise and hold on to—again, Chris touched on this—is the diversity of the housing stock. Not all of us live in the same kind of buildings. Just as some buildings will be difficult and expensive to convert in terms of energy efficiency, insulation and the means of getting heat around the building, others will be easier to convert and improving the insulation will be relatively straightforward, as will connecting the building to a low-temperature distribution system. That might mean that bigger radiators are needed, but, when it comes to fitting heat pumps, that is not so bad.

By recognising that diversity across the housing stock, we can in theory get on with the easier stuff. However, doing that still depends on having enough people with the right skills. Another aspect of building things up is that everything must go hand in hand, so the demand for such skills must come along with the provision of those skills. No one will take on the burden of doing a further education college course, which would take time and perhaps limit the amount of time that they could spend on earning money in the short term, unless they are confident that the business will be there in the medium to long term. There is an issue of confidence for individuals in relation to their own career development, just as there is for large-scale investors.

There is a mixture of the positive and the negative. There is harder stuff to do, but there is also easier stuff, relatively speaking, that, in theory, we could be getting on with. However, that must still be facilitated by various other measures.

Fiona Hyslop: With the 2030 target, the original plans had—[*Inaudible*.]—of carbon capture and storage. You might be aware that the committee took evidence on that last week. One of the messages that we got was that, if we want to get on with CCS, we must do so quickly.

Clearly, there are questions about the Acorn project being put on the reserve list. What does that mean for Scotland's target? What needs to be done about CCS in Scotland? If CCS is delayed beyond a meaningful implementation date, is it possible that the emissions removals and reductions that can be achieved through other action on, for example, peatland, diet or aviation could compensate for the lack of progress?

I will go to Chris Stark first, and then to Professor Bell, if he wants to come in.

Chris Stark: CCS is one of the most difficult and controversial areas in Scotland's present plans. The UK Government decided not to award track 1 status to the Acorn carbon capture and storage cluster, on which I am certain that you will already have taken evidence. The Scottish Government's plans for 2030 nevertheless include a lot of what we call engineered greenhouse gas removals, and those rely on CCS being available in Scotland by 2030.

To put it in Alex Ferguson language, we are in squeaky bum time. The decision on whether the CCS facility will go ahead will have a major impact on the achievement of the 2030 target, if the Scottish Government's present plans remain the same. We talk about the issue in our report.

It is important say that the Acorn project is not dead by any stretch of the imagination. It is a really important project that I am sure will have a route to market as soon as that is possible.

The Acorn project was up against two very good projects in the north of England, and the Prime Minister had promised to support two projects. It is on a reserve list, I suppose. It is a very, very good project; the question is not whether it should be developed but whether it will be available on time to have the impact that Scottish ministers would like it to have in the climate change plan update. We need to press all the buttons that we can press to enable that project to join the two projects in the north of England and find its way to financial close. That would be the best outcome.

10:30

However, even if that happens, there is still the question whether greenhouse gas removals will be available in the quantity that the Scottish ministers would like them to be. Even if they are not, we must press on with the approach, but there is a risk that Scotland might not be able to rely on greenhouse gas removals through carbon capture and storage. If that is what happens, we will need a clear decision from ministers. We make that point in our report: we recommend that a cut-off point for a decision be identified, which we say should be 2023 at the very latest.

Beyond that, we have to look to other areas. As you said, Ms Hyslop, those tend to be areas in which we can make a more immediate reduction, such as peatland restoration. Changes in the nation's behaviour or diet can have an impact on emissions reduction. We have talked about other such areas, such as aviation and industry.

It is possible to replace the lost greenhouse gas removals that are in the plan for 2030, but that will be really difficult and we already have a really difficult and challenging plan. Keith Bell talked about inertia; we cannot just turn these things on, we have to scale up to doing them and we are really up against the clock if we are to do that by 2030. Hence the decision point of 2023.

Fiona Hyslop: Do you want to add anything, Professor Bell?

Professor Bell: Everything that Chris Stark said was very sensible. The engineered removals risk is the single most obvious risk. We are talking about a big project with big investment, with a key decision-making process that sits in London, albeit that it also depends on investment from within Scotland—a number of pieces come into play.

The broader point is that there are risks across the whole plan, and it is sensible to have contingency or to ramp up other things, such as the areas that Chris Stark talked about. Those areas should not be neglected.

In the profiling process over time and as activity is ramped up, there is no hard stop when we get to 2030—or there should not and need not be a hard stop. It is a bit of a modelling artefact, but when we look at the profiles that are part of the climate change plan update, we see that reductions in sectors such as transport or buildings suddenly stop in 2028 or 2029. That should not happen in reality. If, by then, you have already built up a sector and a skills base and there is still somewhere else to go, in that there are still a number of buildings to do, we should expect the effort to continue, even if, as you get through the stock, the rate at which you do things gradually slows down.

That is all part of a just transition. It is about enabling people to get into other sectors; it is also about making a graceful exit as need and demand settle down and we get into more of a turnover and maintenance cycle.

The risks are there across the board and need to be carefully managed.

Fiona Hyslop: Thank you.

Finally, I want to ask about cement. The committee was told recently that if cement were a country it would be in third place after the United States and China when it comes to its global emissions. We heard about the potential of carbon capture, utilisation and storage in relation to cement. Should there be more focus on innovation and other aspects in that regard? We know that world capital is interested in the most obvious and exciting investments, particularly in relation to renewable energy generation, but should we be looking at the unsexy subjects, such as cement, given that the message that we are hearing is that we have to do more of everything, rather than just one thing?

I will put that question to Chris Stark, and the convener will let us know whether there is time to bring in Professor Bell, too.

Chris Stark: I find cement tremendously sexy—I have no issue with that, and we should be talking about it. Such topics really do matter, and the point that you raise in your question is absolutely right. Perhaps along with steel, cement is the basis of global infrastructure. Throughout the world, it is a measure of how developed an economy is, and we need it.

There are ways to develop zero-carbon steel and cement. That rests on a combination of things, including a switch in the fuels that we use in industry and probably the use of carbon capture, too. That takes us into a different sort of discussion about how to decarbonise the economy, which, for me, is the next stage in the plan. Over the past 10 to 15 years, we have talked mostly about how to decarbonise the power sector, which is done now in Scotland although we still have a massive task to grow the size of the renewables supply that needs to be generated. The task of decarbonising is done, by and large, but we need to move on to the next set of challenges. Looming large among those challenges is what we call industry emissions, and cement is in there.

To give you a sense of the challenge, every five years we give advice on a new set of climate targets across the whole UK, including Scotland. We did so a year ago, last December, and in that advice we looked hard at the industry questions. To give you a measure of that, we advised a 2030 target five years ago; five years later, we dialled up the ambition because we now have a net zero goal. Therefore, we looked again at the 2030 target, and 75 per cent of the change in the target comes from an outlook on how to decarbonise industry that is different from the CCC's. We see much more opportunity to decarbonise the heavy industries, as they are sometimes called, including cement, than we did in previous assessments, because we can now see a path to fuel switching, using electricity more extensively in those industries, as well as using hydrogen and carbon capture.

I would love to see Scotland take the lead on that, as that would help immensely in the achievement of the targets. Never mind the targets—crucially, that is a source of future industrial success for a country such as Scotland, bringing economic success and jobs. A feature of the fact that Scotland has more ambitious targets in the short term compared with the rest of the UK is that it can specialise in some of those aspects of the transition.

There are places that currently pump out lots of carbon dioxide in the production of cement—I believe that there is a cement facility in Dunbar, for example. They can be decarbonised, and it is really important that they are. For me, that is exciting stuff, and I would like us to talk more about it. That is one reason why, a few times now, I have raised what we think is a lack of ambition in the Scottish Government's industry plans.

Fiona Hyslop: Thank you. I now hand back to the convener.

The Convener: Thank you. I will now bring in Liam Kerr, to be followed by Mark Ruskell.

Liam Kerr (North East Scotland) (Con): I am very grateful, convener. Good morning, gentlemen.

I will pick up on your progress report, in which you say, about the climate change plan update, that you

"have not been able to establish whether and how policies and proposals add up to the required emissions reductions."

Does the Scottish Government now have the right tools and models to quantify how the policies that you have talked about

"add up to the required emissions reductions"?

Chris Stark: I think that it does have the tools to do that. It was a conscious decision to flag up the difficulty that we have had in understanding the gap between modelled pathways and the policies. The climate change plan update contains a set of modelled sectoral pathways for emissions reduction. We have talked about them a few times already, but I do not mind talking about them again. They are produced by the Scottish

Government using the integrated MARKAL-EFOM system, model, which is known as the TIMES model. It looks to us as if that model has had steam coming out the side in producing the sectoral pathways. It has been unable to produce smooth pathways to the 2030 target and beyond, and lots of off-model adjustments have clearly been made in a range of sectors. There is an issue with the modelling of the pathways and a collection of odd trajectories for the sectoral emissions, which Keith Bell has mentioned, where it appears that the TIMES model has not coped.

We see a sharp decline in the early part of the coming decade, and then a strange plateau, or a straight line, in some of the sectors, where the model has decided that you should switch to another sector to find cheaper emissions reductions somewhere else. That is not the way that the real world works. If you work really hard to decarbonise the buildings sector, for example, you would not stop at some point during the coming decade—you would carry on. Out there in the real world, you would have supply chains that were continuing to do that work. There is a modelling issue there.

Another issue is transparency, if I can put it that way. We have not been able to tie policies that Scottish ministers have announced to the pathways that they published in the climate change plan update document. To a degree, I would always expect to see a slightly incomplete policy package—you want a pathway into the future, and the further out you go, the less sure you are of what policy will deliver. I am perfectly happy with that.

Nonetheless, there is now quite a gap between the stated ambition for policy, as best we can see it, and the modelled pathways. I would like to see that gap closed, and to understand better what the list of announcements that Scottish ministers have made will actually deliver, or what they are expected to deliver, in greenhouse gas terms and, crucially, how those policies will be funded and delivered on the ground. We can then start to wed things together a little more. That was essentially the issue that we flagged up.

I think that the Scottish Government has the tools to do all that, but it has chosen—for whatever reason—not to publish the detail. I am afraid that we have not been able to find that information.

Professor Bell: I reinforce those comments. My understanding is that, over the past year, the Scottish Government has been commissioning work, from various consultants or whoever, to dig into the extra layer of detail that would sit behind what the climate change plan update was suggesting was possible. The word “suggesting” is important, because models are a means to an end—they do not give you the whole answer. There is a classic quote from a statistician, George Box—I feel almost contractually obliged to throw it in at some point—who said:

> “all models are wrong, but some are useful.”

You have to know how to use models. A model helps you to understand the potential answer, but it is not the answer. You have to flesh out and understand the model’s limitations and what it is telling you, and then—as I said—commission more work or do more work internally.

That is another challenge—what is the civil service able to do itself? What expertise does it have in-house, and how does it understand the interaction between different sectors and different issues—for example, the interaction between finance and technology, skills and so on? What expertise does it need to buy in from outside? I believe that the Government has been trying to get some of that extra information and buying in the expertise from outside, but that is taking a bit of time, and the information still needs to be drawn together.

To use another cliché, you would not start from here. I simply encourage the Scottish Government to put in sufficient resource and spend time thinking and drawing all the information together before putting it out for external scrutiny. The Scottish Government would not be so arrogant as to assume that everyone has got it right—that would be the same for us in the CCC. We want to get things out there and say, “This is our line of thinking and this is where it’s come from”, and draw together expertise from the wider world.

Nobody has all the answers, and it is hard to put everything together, so we need on-going discussion in a public forum to enable us to get an extra layer of detail.

Liam Kerr: I will drill down into a specific area. The Scottish Government recently published its catch-up report—“Report on proposals and policies to reduce greenhouse gas emissions following annual target for 2019 not being met”—in which it set out various proposals and policies to compensate for the excess emissions as a result of the missed target in 2019. Yesterday, I got a letter from the Cabinet Secretary for Net Zero, Energy and Transport—I appreciate that you will not have seen it—in which he said:

> “We are also confident that the additional policies included in our ... Catch-Up Report will more than exceed the 2.7Mt from the missed annual target”.

Does the catch-up report contain adequate policies to mitigate 2.7 metric tonnes of CO_2 equivalent? Even if the policies are there, will they deliver?

Chris Stark: I am certain that the 2.7 metric tonnes can be recovered, but there is a wider

issue around the extent of change that is necessary to keep on meeting the annual targets.

10:45

The Climate Change Committee had a big debate about that very issue, which is very challenging. The targets are all legal targets. The framework in Scotland has a net zero target, a set of interim targets—notably, the 2030 target, which we have talked about a lot—and annual targets. I am as certain as I can be without having the data that the 2020 target will be met. We will not get the data until next year, but we were in the midst of a huge lockdown and a global shutdown that will have suppressed emissions to an extraordinary degree. I am also certain that the infrastructure that causes emissions, which was lying dormant over that period, will have restarted. We can already see on Scottish roads the number of cars that are making journeys, and we can see the reluctance of the Scottish public to use public transport. We are in our homes and heating those homes, rather than being in heated offices.

There will be all sorts of on-going challenges to meeting the annual targets. Those targets will be difficult to meet. In our progress report, we said that, after the 2020 target has been met, the next target will almost certainly be missed. I am afraid that we do not have a great record of meeting the annual targets under the Climate Change (Scotland) Act 2009—more have been missed than have been met.

My view is that we should draw a line under what has happened and focus as much as we can on achieving net zero and the 2030 target, because there is enough time to address the inertia issues and to scale up the policies and the supply chains that will be necessary to reduce emissions in the real world. Now is the time for us to make the conscious move to focus on what we can achieve. The 2009 act requires there to be catch-up plans, and I am sure that we will continue to have such plans, but let us collectively focus on what really matters, which is cutting emissions as much and as quickly as we can over the next nine years. I do not know whether Keith Bell agrees with that.

Professor Bell: I agree with what you have said. There is an on-going challenge. As we said, the more we get behind the curve, the more we challenge the overall credibility of the forward-looking curve that we are trying to achieve. There will have been a reduction in emissions as a result of the continued tragedy of the pandemic. The travel rebound in car use is very worrying—it is a poor signal for what we can achieve in the future. We hope that we will not be in the position of assuming that there will be only pandemic-related emissions reductions; there have to be underlying changes in how we do things across the whole economy. Longer-term structural changes are needed to deliver emissions reductions.

Liam Kerr: I will drive down into those answers. In your 2020 report, you provided 30 recommendations that were expected to be achieved by 2021, but only nine of them have been achieved. In relation to the recommendations that have not been achieved, such as those on buildings performance, sustainable diets and agriculture policy, and the ones that have been partly achieved, such as those on adaptations, training and skills, and active travel, where does your greatest concern lie? If transport, which has been mentioned, is the greatest concern, what do we need to do to get back on track?

Chris Stark: My greatest concern probably lies in agriculture. In most areas, we have plans in outline that at least have the capacity to deliver the emissions reductions that are required, so we could say that the ambition is there. Very recently, we have changed our ambition in agriculture, but I do not have a sense of how that ambition will be translated through policy. I am afraid that, in the 10 reports that we have provided to the Scottish Parliament, we have consistently raised agriculture as an issue.

If we look at the history of agriculture emissions, we see that, recently, there is what looks like a straight line in relation to those emissions. There is no reason to think that we will deliver the sharp reductions that the Scottish Government is aiming for without some sort of policy shift. I know that a lot is happening in that area and that we have a new ministerial team on agriculture and land use, but I want to see more progress in that area, and I do not mind saying that. We need to see progress across the board, but it looks as though agriculture is the area that is least developed when it comes to emissions reductions.

Agriculture is important for a host of reasons. It supplies the nation's diet. It has a set of other interactions with the natural world. There are biodiversity and natural capital issues. There are all sorts of things going on—a high degree of land use change is required as well—but the policies that we have at the moment, even in outline, and the processes and consultations that are in place do not look to me as though they will deliver the kind of emissions reductions that are being projected in the climate change plan update from Scottish ministers. There is an element of magical thinking going on. There is no reason to think that that line will be achieved without some real focus over the next months and years to deliver that outcome. For me, therefore, that looks like the biggest area of progress that is needed.

Professor Bell: I agree with Chris Stark in policy terms. There is also a big challenge in

societal terms, which we have touched on already. A lot of the emissions reductions that we have achieved so far have been on the supply and production side—for example, through electricity production. We have more than halved the emissions intensity of electricity production. It has cost a bit of money to get the renewables sector going, but that has had the benefit of massively reducing the cost. The cost of energy from renewables is much lower than it was when we started and, depending on what the price of gas is, it is lower than the cost of new production from gas.

That change has been achieved with a bit of an uplift on our bills, but pretty much without anybody noticing. Storms still happen and we need to manage those correctly and get the resilience right, but the change to the supply of electricity has been achieved without us noticing. However, when we come to changing heating systems in buildings, the way we move around—how much we travel, where we are travelling to—or our diets, that will engage everybody.

On the positive side, leading up to the 26th United Nations climate change conference of the parties—COP26—we saw a lot of interest in climate change, emissions reductions and what we can do. To be fair, the Scottish Government has got a good campaign going with lots of publicity around it. The sense that I got from a lot of people and, for example, from seeing the participation in the marches during the COP is that there is a lot of support for that kind of thing. We see that from the climate assemblies and all of that. That is the positive—there is a lot of appetite across society as a whole to embrace the challenge—but getting the extensive change is still a challenge.

To link back to agriculture, the land is managed by farmers and all the people who work on the land. The policies have to be defined with the support of those people, because we depend on them to deliver the policies. It has to be a combined effort. Again, there are a lot of positive things coming from the farming sector, so it is a shame that we have not yet had the policy progress that Chris Stark and the rest of us in the CCC are looking for.

Mark Ruskell: I go back to some of the previous comments about carbon capture and storage. The committee heard some evidence last week that raised concern that CCS could be deployed in a way that, in effect, builds in dependence on fossil fuels. What are your thoughts on that? Do you see a case for separating out the function of something like the Acorn project as a carbon storage system for cement and other hard-to-abate sectors from the industry desire to increase the market for blue hydrogen? Is that something that you have considered? Are there risks in terms of how CCS could be used and deployed, and any unintended consequences from that?

Chris Stark: There are those risks. It has not been our assessment that we need to separate those out and treat the issue in the way you described, but that is an option for the Scottish ministers. You flagged the use of fossil fuels, which is clearly an important issue. We will need some fossil fuels during the transition, but we want to move away from them as quickly as we can. A key bridging technology will be carbon capture. The reason why we like carbon capture is not that we want to use fossil fuels; it is because using carbon capture gives us options that we would not have otherwise, including the production of hydrogen through the use of fossil fuels.

Hydrogen is another bridging energy technology that I would rather we did not have to use but, to be realistic about it, if we want to get by 2045 to a world where we use hydrogen as a supplement to decarbonised electricity in the economy, we have to build the supply of that low or zero-carbon hydrogen in lockstep with demand. If we produce that only through what we call green hydrogen—that is, electrolysing water using renewable electricity—we will not get there as quickly as we would if we used carbon capture. There is a penalty for the climate to that: we will produce more emissions over the transition if we do not use carbon capture than we will if we do. That is the key point in our assessment.

The challenge of blue hydrogen versus green hydrogen faces us in the transition across the piece. We need to think of it not in static terms but as a fluid topic in which we use the blue hydrogen as a bridge to the green hydrogen, which is where we want to be once we have built out the extensive power system and ability to generate electricity that we will need to generate all that extra hydrogen. At that point, we will be able to start decreasing the production of blue hydrogen.

That is exactly what you see in the CCC's plans. We have laid out our assessment of how the UK can reach net zero. In that assessment, we have blue hydrogen growing until the end of the 2030s and then declining again as we grow out the infrastructure that we need in the power system to generate green hydrogen.

I know that that use of carbon capture is controversial, but we are thinking about limiting the overall amount of emissions that we produce over the transition, which is what climate care is about. Using carbon capture in the way I have described minimises cumulative emissions and gives us options to do lots of things that we could not do, such as continue to produce cement, as Ms Hyslop mentioned.

Carbon capture has a role. From our perspective, the key point is that we have to think carefully and in a clear-sighted way about how we use it, where we use it and whether there is a better alternative. That story keeps changing each year with technological development.

Mark Ruskell: I will move on to questions about transport. The Scottish Government has a challenging trajectory on that. It is dependent on a lot of behavioural change. Are the right tools in the box at the moment? Do you have advice on how the Government should approach demand management, for example, as a tool to nail the 20 per cent reduction in vehicle mileage?

Chris Stark: That is a fascinating area, because the ambition that is in the Scottish Government's plans for transport is wonderful to see. They are really ambitious plans, notably on reducing car miles travelled by a fifth by the end of this decade. I would love that to be delivered, but it is way beyond what we have advised in our essential pathway, which is about a third of that. Therefore, you need to work extra hard on some of those issues.

You mentioned demand management in your question. It is one way into that. I admire the focus on 20-minute neighbourhoods and the idea of working local. Promoting modal shift will clearly be a big part of that. The package on active travel that was announced and confirmed in the recent budget will help with that. However, whether it will deliver the 20 per cent reduction in car miles travelled is under question. One of the reasons for that is that, as we come out of the pandemic, people with cars are naturally using them more frequently when they want to travel than they did prior to the pandemic, when they might have used public transport.

Given that we are still under some form of restriction, especially now as we are working from home, there is still an opportunity to drive home the message that we need to reduce car miles and to use active travel and public transport as much as possible. We will have to work doubly hard at that when we finally come out of the pandemic to avoid increasing the car miles travelled.

A set of policies that would allow that is before the Scottish ministers. They include congestion charging and excluding cars from city centres. So far, we have not seen a willingness to use such levers, but I think that they have to be in the mix. I admire the ambition on transport, and it would be amazing for Scotland to deliver on that. However, at the moment, we do not quite have the set of policies in place that would give me confidence that it can be delivered.

11:00

Mark Ruskell: One element of the issue is capital investment in infrastructure. We have the strategic transport projects review coming up in the new year. In the past, the CCC has perhaps been a little reluctant to offer advice to Governments about road building. Where are you on that now? Given the state of the emergency and the challenge that you have laid out in meeting the 2030 targets, how has your thinking evolved over time on capital investment in road infrastructure, induced demand and where we should draw the line on some of that?

Chris Stark: You are right that we have been reluctant. That is because every Government has choices. I do not want the CCC to say that there is only one pathway to achieving the targets. We need roads. I know that there has been a lively discussion on that issue, not least in the Scottish Parliament, where a former minister, Fergus Ewing, has made some strident comments about it. Fergus is right that we need roads, but we have the issue of induced demand running alongside that. We have good, strong evidence that the building of roads creates new demand pressure to use those roads for private transport.

Clearly, not building more roads will have an impact on emissions, but it is also clear that it is possible to meet the targets that Scotland has set while building those roads and encouraging people to use alternative forms of transport. It is our job to lay out those choices. We have not moved to a more strident position on the road programme, except to say that, if the plan is to build those roads, it is really important that the Scottish ministers are clear with the public about how they see the emissions targets being met and, crucially, how they see targets such as the 20 per cent reduction in the number of car miles travelled being met by 2030.

It can be done. You can do all of this together. However, I think that there is an element of having your cake and eating it. I understand the political priority that is given to roads programmes but, if you want to have that roads programme, you have to work doubly hard somewhere else because of the induced demand that Mark Ruskell mentioned.

We have not changed our position on the issue, but I am more and more suspicious about road building programmes if they are not accompanied by a clear statement on how to manage the major challenges that we have talked about.

Professor Bell: That issue takes us back to the question of how demand is being encouraged or discouraged. In respect of car travel, for example, it is about whether an easy alternative is being provided. There is definitely an important role for Government in that. In respect of not just

investment in roads but any infrastructure investment, we have talked in some of our advice about the need for a net zero test that considers the extent to which a proposed investment is compatible overall with the direction towards net zero emissions. We have not taken the step of saying what that test should look like—that will be a job for policy makers—but its importance cannot be overestimated.

It is about going to another layer of detail to inform policy. In respect of roads and car miles, it is about getting a better understanding of exactly what car miles are being used for, where people are going, where the emissions come from, and what they are being caused by. It is about understanding how much of that travel involves commuting, the parent taxi or people going off on holiday on a long journey once or twice a year. I do not know how many times Chris Stark goes on a long holiday. He does not have a car any more, so I think that he travels by other means.

That is the sort of thing that you have to understand. When you think about an intervention to change the nature of demand and what the alternatives might be, it is not enough just to think about an average car, person or journey. Different journeys have different purposes.

My final point relates to the 20 per cent reduction. The UK Energy Research Centre, which is a consortium of academics across the UK that is concerned with energy transition, published its annual review of energy policy last week. It said:

> "Analysis using the UKERC developed Transport, Energy and Air Pollution Model (TEAM) has shown that a 30-50% reduction in car kilometres is needed by 2030, relative to 2020, to meet the UK's 6th Carbon Budget."

It suggests that we need to go even further on going less far in car miles.

Mark Ruskell: My last question is about aviation. We are talking about complementary strategies. The Government's current aviation strategy seems to be about increasing aviation, although there was a recent recognition that aviation development needs to drop in order for us to meet the transport carbon targets. What is your advice on the approach that any new strategy needs to adopt? Where should we focus on to reduce emissions? Of course, there are all the unicorn fuels for aircraft but, given the severity of the situation that you laid out at the beginning, I am not convinced that we are going to get there through that alone.

Chris Stark: I firmly agree with the premise of that question. It is important to say that we have often arrived at the discussion of aviation as though it is the answer to tackling climate change, but it is not—aviation emissions are just a small proportion of total emissions. However, they are a proportion of emissions that we expect to remain pretty constant over time as everything else falls, so we should focus on them.

The other aspect of aviation is that it is driven by our use of planes and the fact that we like to fly to places. The turnover of the stock of planes that burn fossil fuels happens very slowly. That means that many outlooks on what to do about aviation focus a lot on the fact that we cannot change the planes and cannot change—apparently—the behaviour of people in the country who want to use those planes, so we had better move towards having some sort of drop-in replacement, such as a zero-carbon fuel. There is scope for some of that, but that will not tackle the issue.

We come back again and again to the issue of aviation demand. We have seen no specific commitment from the Scottish ministers on aviation demand across the various things that have been published. Such a commitment is necessary. We have made that point at the UK level and in the Scottish sphere.

Our central assessment allows for some growth in aviation, but that growth is suppressed. There are other scenarios in which we consider an absolute reduction in aviation demand. As we come out of the pandemic, some of those scenarios could become more achievable than they would have been prior to the pandemic. However, we need to work at that, and there need to be policies to achieve it.

At the moment, we see a policy from the Scottish Government to have fully decarbonised domestic aviation by the time that we reach the net zero target. That is just about achievable through electric planes and potentially through some of those fuels, but I do not know how it will be achieved. A much more sensible policy from the off would be to say that one element is to depress the demand for aviation in the first place. Therefore, the best policy of all is to offer a better alternative to using planes in the first place, which points to better rail travel and the decarbonised road transport that we talked about.

That is the challenge. Given the fact that things move so slowly in relation to the stock of planes in the aviation sector, we have to give people better and cheaper alternative means to make those journeys. We are not seeing too much of that from the Scottish ministers.

Professor Bell: I will reinforce the point about understanding the nature of demand and the different segments of demand. People flying to the continent once a year for a bit of sunshine or flying up and down to London every week or a few times a week is a different issue from people taking transatlantic flights. I do not have all the data on this but, anecdotally, I read an article in the

newspaper a few weeks ago about people who had changed their flying habits since the beginning of the pandemic. Some of those people were taking transatlantic flights a few times a week—it is just extraordinary. They were asked whether they had managed to do their work without taking those flights. The answer was yes, apparently, they had. Who knew that that was possible?

A one-size-fits-all approach is not the right answer. We have to understand the different nature of these things. If we are talking about a small aircraft going to the Scottish islands, doing that sort of thing electrically seems feasible, but it is not really feasible with bigger aircraft. The question is the size of demand in the first place.

Mark Ruskell: Thank you. Back to you, convener.

The Convener: I call Collette Stevenson, to be followed by Jackie Dunbar.

Collette Stevenson (East Kilbride) (SNP): Good morning. You have already touched on the heat in buildings strategy, but I want to ask about the real-world impact of the pathway that has been set out by the committee and the Scottish Government with regard to decarbonising buildings. What will the impact be on, say, householders, the energy industry and even the supply chain? What about the skills development elements and, indeed, the public health benefits?

Professor Bell: All of those things are really important, but you make a good point in highlighting the health benefits. It is very important to have a warm home that does not suffer from damp or whatever.

A couple of years ago, one of my PhD students at the University of Strathclyde did some work to get a better understanding of the whole challenge of decarbonising domestic heating. They did a bit of partitioning, broke down the demand, looked at, for example, different sizes of homes and households in different income brackets, and used publicly available data to see how much energy they were using. We could see that, for those on low incomes in small homes that had direct electric heating, the energy that they were using seemed to be underheating those homes. We did not have any evidence of why that was happening, because that was not the kind of study that we were undertaking, but one hypothesis was the cost. If you can make heating more efficient, you can get health benefits, because people will not need to underheat their homes any more. Of course, work has to be carried out on the fabric of buildings as well as on the heating systems.

That brings us to another really important part of a just or fair transition. A big part of it is about making a graceful exit from some industries, getting people into alternative sources of employment and, as you have suggested, building up their skills, but another part of it is about ensuring that people pay their fair share of costs. Earlier, Chris Stark talked about upgrading a lot of capital stock, including homes, in a timely way with low-carbon appliances, but the question is: how are those costs going to be met? The costs of electricity in future should be modest if there is greater reliance on low-cost renewables, but it cannot be denied that the cost of the transition in, say, converting to heat pumps or upgrading homes is very significant. How can those costs be shared fairly to ensure that we gain those health benefits and improvements?

Chris Stark: We often get lost in talking about how difficult the transition will be with regard to decarbonising heating. I wish that we could be more excited about that, because it seems to me to be a great opportunity. Over the next 10 to 15 years, we could completely turn around people's experience of homes in Scotland by ensuring that those homes are warmer and less draughty places that are heated without using the fossil fuels that create climate change problems. That would be a fundamental shift and a positive improvement that we could make in people's lives.

The supply chain and the jobs necessary to do that would be pretty extensive and domestic, and it is much better that we think about and plan for that now. We could potentially have a supply chain doing that work in every town and city. It is so exciting to think that way. In fact, the ambition that the Scottish Government has laid out in its climate change plan update is absolutely stonking in that area. It talks about cutting emissions by 72 per cent by the end of the decade, which is double our most ambitious assessment. If ever there was a clear statement of intent, it is that.

The heat in buildings strategy lays out how that ambition might be achieved, and there is a big spending pledge as well. Let us now get on with it and turn that into the real-world change that will drive all of that. In the end, it is profoundly positive for the Scottish economy and for people living in homes in Scotland to make that change overall.

Rather than that being discussed in the terms that we usually discuss it—that is, in terms of how difficult it is—I would love to see a more optimistic framing. I know that that will be tricky, but we are talking about the transition that people will notice most. People do not notice the fact that they can boil their kettle now and that, at any moment, they might have fully decarbonised electricity. That is a great achievement, but it does not involve changing lives. This transition does and, unless we frame it in a positive way, it will be really difficult to achieve.

11:15

Collette Stevenson: Those are really interesting comments. On the Scottish Government's proposed policies, the spend of £336 million this year correlates with expected emissions reductions. Is there an adequate methodology to calculate that?

Chris Stark: I do not think that there is. However, again, I do not want to dismiss the fact that that spending has been made. That is a big commitment. There is no question but that spending that amount of money on the challenge is a really substantial thing to do. That will involve a mixture of things. It will be about making homes more energy efficient, improving the insulation of those homes and, ultimately, replacing the heat source for those homes. Doing that stuff tends to be an expensive business, so that kind of public spending commitment is very welcome.

At the risk of my sounding as if I am being dismissive—I am not; it is very impressive that that commitment has been made—we do not have a connection to the emissions reduction. We do not understand what that public spending commitment will achieve in greenhouse gas emissions terms. I would like that, and I think that there are the tools for the Scottish Government to publish that and make that clearer so that we can do our job of assessing it.

Given the size of the spending commitments, I would love to be more positive about them. I would love to assess progress and say that the Scottish Government has got it right. Apart from anything else, that would be a very helpful thing to be able to say to other parts of the UK. A translation of that spending and policy commitment into an emissions saving, and the Scottish Government putting the numbers out there and being clear on how that will be done would really help.

Professor Bell: I do not know whether members of the committee listen to "More or Less" on BBC Radio 4. Often, when a number comes up, the host, Tim Harford—actually, we have gone off Tim Harford since he promoted his own book in one of our CCC webinars—asks the very fair question, "Is that a big number?" In absolute terms, £330 million is a big number but, relative to the challenge of what we are trying to achieve and where we are trying to get to over the next 10 years especially, is it still a big number?

There is something that I try to reinforce with my PhD students and that I tried to reinforce in talking to colleagues when I was in industry. Spending a bit of time and effort and a bit more thinking time on working out the potential solutions to a challenge or how things might go can save a hell of a lot in terms of the investment cost in the medium to long term. Getting that extra layer of analysis and confidence pays back over the medium to long term. You can throw money at something but, if it is not well targeted, there is the risk of that money not being very effective.

Collette Stevenson: I have no further questions.

Jackie Dunbar (Aberdeen Donside) (SNP): Good morning to you both. Are the oil and gas reserves that are currently being exploited enough to meet domestic needs to 2050? If they are, is it important to distinguish between the new reserves and the existing ones?

Chris Stark: If we think about it at a UK level, we are an importing country. At a Scottish level, I am afraid that I do not have the stats in front of me, but we still import. That is particularly true of a lot of the gas that we use, as we have bigger oil reserves. It is really important that we think clearly about the issue. We know that the problem of climate change is being caused by our exploitation and our unabated burning of oil and gas—and sadly, in some places in the world, coal. At some point, we will have to focus on that global issue.

We use projections from the Oil and Gas Authority, which looks across the whole of the UK continental shelf. It provides us with an assessment of the emissions from the sector, which we take as a starting point to assess how emissions from the North Sea can be reduced. I am afraid that I do not know what is in those projections, because the OGA does not provide a breakdown of existing and new fields. For example, on the controversial topic of Cambo, I am afraid that I do not know whether that is in the projection, because we do not get that breakdown.

From our perspective, the important thing is that, in the end, we have to do something about our unabated burning of oil and gas. The discussion has principally been about reducing our demand for oil and gas onshore. More and more, however, we are discussing the global question of whether we should continue to look for oil and gas and bring it out of the ground. We are planning to provide some evidence on that in the new year, and we will try to take a more global outlook on the overall challenge.

We absolutely recognise that there is a transition, that we will need fossil fuels over that transition and that it cannot happen overnight. However, we have said that meeting net zero will entail moving almost entirely away from the unabated use of fossil fuels. By the time we get to net zero, we will really just have jet fuel. We have to match those two things and have a more sensible discussion about the outlook for production in the North Sea.

It is not as simple as saying that we have home-grown supplies and we are therefore insulated

from the recent price fluctuations in, for example, gas. We do not have the domestic supplies that would allow that. We have to recognise and come to terms with the fact that, although we need some fossil fuels during the transition, we should bring them out of the ground only when we absolutely need them, and we should do that in ways that produce the absolute minimum of emissions at source.

From my perspective, when it comes to North Sea production emissions—that is, the emissions that are produced through the production of oil and gas in the North Sea, rather than the emissions that are produced as we burn them—I do not think that the industry has done nearly enough. The North Sea transition deal talks about reducing emissions by 50 per cent. We said that that figure could be much higher—our recommendation was 68 per cent. Until the industry is meeting that ambition, the idea that we can bring more out of the ground is worth questioning.

We will look at the issue in the new year—probably in January, although it might slip into February—through a consultation response to the latest publication from the Department for Business, Energy and Industrial Strategy. It has just published something on what it calls the climate compatibility checkpoints for new oil and gas licences. We want to feed into the consultation on that, so we will do some analysis and publish it in the new year.

Jackie Dunbar: You touched on new licences and climate compatibility checkpoints. Should existing licences that have not been developed also be subject to those checkpoints?

Chris Stark: We will look at that area. My view is that, given that we do not know what is in the baseline, we should be thinking more about the central issue of what is put into the air. In the end, that is what matters—that is the problem.

I do not make much of a distinction between new licences for new fields and licences that have been granted for fields that have not yet been consented. What matters is the greenhouse gas emissions that are produced. We will do more work on the matter but, sadly, we do not have as much transparency on it as I would like to have to allow me to eyeball those projects that have been licensed but are not yet consented.

That is where we are. What matters in the end is not whether a licence is in place, because the climate does not care about that.

Professor Bell: The question about whether domestic production meets domestic demand implied a security of supply issue. As Chris Stark said, domestic gas production does not meet domestic demand. We import about 50 per cent of the gas that we need to meet demand. If our demand was lower, our exposure to whatever is happening on the global market would be lower. However, if we had greater storage capacity, we would also be better protected from global market fluctuations or physical supply issues.

At a UK level, we do not have very much gas storage. There is a certain amount of what we call linepack in the gas network, and there are a couple of liquefied natural gas facilities down south. However, the Rough storage facility was closed a few years ago by the commercial provider of the facility, Centrica, which argued that the earnings that it could get from the facility by buying the gas when it was cheap and selling it when it was expensive were insufficient to cover the costs. I have only had a quick look at the numbers but, although that might have been true in the year or two before Centrica closed the facility, I am not totally convinced that it has been true since then. If it was making the same decision now, that basis for doing so would not look correct. There is a strategic decision to make that involves a role for Government and plays into the security of supply issue.

On the petroleum side, I think that we already export about 80 per cent of our production, and what goes through our refineries is mostly imported. There are different kinds of composition for the crude that is pulled out of the ground, so it is not quite as simple as saying that domestic production meets domestic demand.

Jackie Dunbar: Thank you. My other questions have already been answered.

Monica Lennon (Central Scotland) (Lab): We heard from Chris Stark that the area that is giving him the most concern in relation to reduction of emissions is agriculture, and we know that the CCC has persistently raised concerns about the Scottish Government's agriculture policy. I think that I see some lovely cookbooks on the shelves behind you, Chris, and I have a question about food and diet.

The CCC pathway requires a 20 per cent reduction in the consumption of meat and dairy by the end of the decade. So far, however, the Scottish Government has not made any commitment to reduce meat and dairy consumption at that level, but it might work nicely as a new year's resolution. What action would you like the Government to take in 2022? What about the people in Scotland—what should we be doing?

Chris Stark: There are many ways of answering that but, briefly, we advise that diet should be part of the policy mix in relation to the Scottish Government's objectives, because diet is strongly tied to how we use land. If we see a shift in diet such that we have fewer livestock—particularly sheep and cows—we can reduce

agricultural emissions and, crucially, free up land that is presently farmland for storing more carbon.

There is an interesting interplay between the nation's diet and the extent to which we can change the use of land across the country. The use of land is absolutely central to the achievement of net zero, and we only have a fixed pot of land. That is why we come back to the diet question.

It is really important to say that there is plenty of room to continue with agricultural practice in Scotland. We can still have a nation that consumes meat. There is no question about any of that. However, if we did not use the change of diet as a lever, we would make things much harder somewhere else. We would need to work harder on some of the other elements of the transition, and we have already talked this morning about the extent to which that is possible.

We are trying to do everything at once—that is the challenge. For us, not addressing the nation's diet looks like a gap. Another important reason to address it is that the nation's diet is tied to the nation's health. The guidance on healthier diets already promotes a reduction in the consumption of meat. We are very clear that a shift in diet needs to be part of the mix. My point is that I do not know the extent to which Scottish ministers regard it as part of the mix, because they are silent on it.

We already see a change in diet. When we look at the very limited evidence that is available on diet in this country by age, we see that younger people are eating less meat than older people. It could be that that change will deliver much of the 20 per cent reduction in meat consumption that I said is absent in policy. However, we need to hear from ministers what they think about that. I suspect that change in diet is implied in the plans that we have from the Scottish Government, but it is not written anywhere and there is no number that allows me to understand that.

11:30

In our assessment, we have said that an element of diet change will happen naturally through that shift in the generations, but something over and above that is required. We have stopped well short of proposing anything that you might think of as being punitive policy; we are not proposing things such as meat taxes. We are saying that it is about having better information, setting better standards, giving the country a better sense of what would help overall and pointing towards healthier diets as a key lever. I think that that is missing.

The Scottish Government is silent on diet in the round, and I do not think that it needs to be. Part of the reason why it is is that this is such a politically charged topic, but it will continue to be politically charged unless we confront it, take the sting out of it and understand what is planned in the Scottish Government's climate change plan overall. I am looking for that transparency more than anything else.

Professor Bell: Given the extent of the charge in this as a political topic, maybe we can discharge it somewhat. I hope that, just as there is cross-party agreement on the overall emissions reduction target, there is agreement on the different levers that need to be pulled to reach it. I hope that committee members are willing to engage on the topic. Twenty per cent is a very modest reduction and, as Chris Stark said, that reduction may well happen anyway because of shifts in choices and behaviour across the generations.

A recurring theme in our session this morning has been enabling things, or making things easy to do. We need to make it possible for people, even if they still choose to eat meat, to choose meat that has lower emissions associated with it. How do people know where the meat that they eat comes from or what practices have produced it? I do not have the data on how much of the meat that we consume in Scotland is imported from outside the UK, but I have seen some data that suggests that the emissions that are associated with that production, for example in Latin America, are much higher.

Meat that is produced here might be more expensive per kilogram to buy, but we can talk about its better quality and how it keeps jobs going and helps the management of land in Scotland. If people do not buy as much meat, maybe they will spend the same amount per week but get better quality. That is an easy thing to say, although it might be more difficult to help people to adopt that as a practice.

People are now more interested in the provenance of food, which is good, although it seems to be pockets of people. We need to make it easy for everybody to make those choices. In my experience, it is difficult to find all the ingredients in an Ottolenghi cookbook such as the one on the shelf behind Chris Stark. We want to make it easy for people to find low-emission foods, whether that is a bit of meat that they enjoy a couple of times a week or plant-based products, which also have associated emissions. What easy recipes can we use and adopt to make meals that are satisfying, fun to eat and healthy?

Monica Lennon: Thank you, Professor Bell. We are making everyone hungry, and it is almost lunch time. As someone who has been a vegetarian for almost 30 years, I can say that it is

a lot easier to be a veggie now, but I have not gone fully vegan.

It is very interesting to see some of the recommendations for the Climate Assembly from the Children's Parliament. There is a shift there. Can you say more about what the Scottish Government should and could do to have a more integrated approach to land use, agriculture and forestry? Also, if you have had a look at the draft national planning framework 4, which is out for consultation, do you think that there are opportunities that are not being fully realised in that?

Chris Stark: That is a great question. Our outlook on how we use land, agriculture and nature needs to be more integrated, and that is a challenge that we, in the CCC, recognise. We are tasked with considering not just how we reduce emissions, which we are talking about today, but how well adapted we are to climate change, which is another integrated challenge. When you think about nature and land, it is particularly obvious that we have to address those things together. We are also on a journey to be more integrated in our outlook on those things, and you can throw biodiversity into the mix as well, because there is a ministerial portfolio that explicitly covers biodiversity.

Those are the challenges that we face, which are very unlike the energy challenges. That is not to say that we have solved the energy challenges, but we have a heck of a lot of analysis that points to meaningful strategies for how we can tackle those and, by extension, the transport challenges. All the things in that area tend to be well considered. This is a much more organic—in all senses of the word—and a bigger challenge, and we need to be better at advising on it. Our advice in the past has often foundered politically in relation to lifestyle issues, because we need to understand that there are important lifestyles, trades and skills across the UK, but particularly in Scotland, that are unique to this country, and it is right that we defend them.

My view is that we can do all of that together—there is no barrier to our doing so. For example, in relation to our assessment on achieving net zero, we can maintain the amount of food that is produced across the country; we can just change the mix of food that is produced. You can have more land to store carbon if you have reduced numbers of livestock.

The Scottish Government's policies on agriculture are vague and we have a lot of doubt about whether they will be enough to drive the necessary emissions reduction that we have talked about. I have mentioned this already, but I do not mind saying it again: emissions from agriculture have been pretty stable in Scotland, particularly over the past decade or so. It is a difficult sector to decarbonise. It requires proper forward planning to get the results that we need, and the Scottish ministers now have a much more ambitious pathway. I do not know how those two things will be connected, but at the heart of the issue is a much-needed post-common agricultural policy strategy.

We are now out of the requirement to have CAP govern how we support farmers, which is a big opportunity for change. The climate change plan update does not make any significant advances on that topic and is still a strategy in development. I am sure that that can be addressed, and I get the sense from my engagement with Scottish ministers that they want to address it, which is great, but it will require a lot of change very quickly. The Scottish Government has something called the agricultural transformation programme, which will help, I hope, but it does not look as though it will be there on time. The earliest that the agricultural policy might be reformed is probably 2023, and the earliest that it might be implemented is likely 2025. I do not understand how you connect that to the pathway that the Scottish Government has laid out for agricultural emissions unless you bring in some of the issues that we have talked about, such as low-carbon diets or being more active in pushing the idea of releasing what is presently farmland and moving it into carbon sequestration and agroforestry.

I am afraid that we do not have that kind of clarity, so I am doubtful that that is the plan over the course of the early part of the decade. We may get there in the end, but the targets that have been set are in law and they are relentless. They say that we have to make those emissions reductions by 2030, and we have talked about the annual targets along the way. They will be very difficult to meet, particularly if we do not have a land use and agriculture strategy wedded to them, which we do not.

Overall, the climate change plan is light on intervention in that area and everything looks as though it is in the latter half of the decade. That will not cut it in relation to the emissions targets, so we need a better and more robust plan that provides much more clarity and sooner action. That is the challenge. We have been consistently making that point in all the assessments that we have offered to the Scottish Parliament, but they have not, I am afraid, been acted on.

Professor Bell: I will briefly add one thing. Monica Lennon made a great reference to the national planning framework, which is really important. I am sorry that I have not made time to consider what that looks at and what it will contain. However, it is a very unsexy topic. We talked about subjects that are sexy, and the national

planning framework is probably not, but there is a lot of important detail in it about the way that land is used that underpins many different sectors.

Although Chris Stark touched on it very briefly in his remarks just now, we have not talked much about adaptation to the climate change that is already happening. One possible way of doing that is, when proposals come forward for planning approval, to ask whether the proposed development is well adapted to the climate change that is already happening, such as the weather patterns that we will definitely see in 10 or 20 years' time. If we do not have global action in the right direction, it could be even more extreme than the baseline assumption. Those sorts of considerations could be built into statutory frameworks.

Monica Lennon: Thank you. That has been really clear and helpful.

We are running out of time, so I will squeeze in one final question. The CCC has said that the Scottish Government already has many of the levers. We know that the Scottish Government is a fan of the four-day working week, which the citizens climate assembly recommended, and there is a £10 million fund for pilot schemes on that idea. What is the Climate Change Committee's view of the four-day working week's contribution to our journey to net zero? Is it positive? How should that £10 million be used to demonstrate that the four-day working week could be a game changer?

Chris Stark: It is always best to say these things at the time, so it is important to say that we have not done the analysis on the impact that a four-day week would have, but I am happy to flag the concerns that I have about it by drawing on the lessons from the pandemic and the requirement to work from home.

In one sense, it is appealing to have people at home more often, because they are not, therefore, commuting to work. However, during the pandemic, we have still had to heat the place where we live. I would previously have been in the office, but I am now heating my kitchen. I am in my kitchen because, sadly, my wife has Covid, so she is upstairs. That is one of the challenges that we now have. We have to keep this building warm, and emissions are associated with that.

I am not in a position to do this at the moment, but, during the pandemic, people have used the time that they used to spend on their commute for leisure purposes. Typically, that has meant people getting in the car and driving somewhere. Therefore, it is not entirely clear that there is a direct connection between the number of days worked in the office and emissions reduction, although we might be able to cement that link.

With regard to what the Scottish Government does with that £10 million pilot fund, it might want to make sure that, during those three days when people are not working, there are ways to direct, help and encourage them not to pursue that higher-carbon lifestyle. When we do it in those ways, it tends to be a very positive discussion, and I think that that is what the citizens assembly was considering. A really good use of the £10 million pilot money would be for the Government to focus on a set of ways to encourage people, over those extra days of leisure, to move away from high-carbon services, goods and lifestyles.

Professor Bell: [*Inaudible*.]—days of leisure. There are all sorts of other things connected with that. For example, people who have responsibilities at home, such as caring for children or older people, would have more scope to do that, so there is a connection there. As Chris Stark said, the connection with emissions reduction needs to be clear, but there is the potential for lots of different benefits.

Monica Lennon: Thank you both. Chris, I hope that your wife is on the mend soon. I send my best wishes to all of you.

The Convener: Thank you, Monica—likewise.

We are running slightly behind, but I have one brief, final question, which I think it is important to ask. What will be the on-going role of the Climate Change Committee in monitoring and reporting on emissions in Scotland?

Chris Stark: I hope that we will continue to provide the service that we provide at the moment. The Climate Change (Scotland) Act 2009 makes it clear that there has to be an independent assessment of progress, and we are the body that is tasked with providing it. As a resident of Scotland who worked in the Scottish policy sphere when I was in the Scottish Government, I feel very close to the issues and I want the Scottish assessment to continue to be done by the Climate Change Committee.

11:45

A really important point to make is that the Scottish Government has, on two or three occasions now, announced that it is keen for us to have a formal office in Scotland so that we can have a closer link not just with some of the policy issues but with Scottish stakeholders. That will allow us to have a better and richer discussion about the things that we have talked about this morning. I am super keen for that to happen, and I very much hope that, in the next 12 months or so, the Scottish Government can find the pretty small amount of funding to allow that. It would be my intention to set that office up pretty quickly, and it would allow us to have a richer relationship with

Parliament on the issues that we have talked about and a deeper relationship with the Scottish Government, too.

When we have developed such relationships in Whitehall and London, we have found the approach to work extremely well for us, and we are finding more and more that we have to develop the local knowledge that is needed to give advice on some of the fundamental societal issues that we have talked about today and in our report. If we can get it right, it will set us up very nicely to provide you with this service for the next decade or more.

The Convener: That certainly seems sensible to me.

As we have come to the end of our allotted time, I thank Chris Stark and Professor Bell for their expertise and insights in this area, for their on-going support for the Scottish Parliament and, indeed, for sharing various quotes from “This is Spinal Tap” and Sir Alex Ferguson, to name but two. I wish you both a very happy festive break.

11:46

Meeting continued in private until 12:17.

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