OFFICIAL REPORT
AITHISG OIFIGEIL

Environment, Climate Change and Land Reform Committee

Tuesday 25 February 2020

Session 5

The Scottish Parliament
Pàrlamaid na h-Alba

Tuesday 25 February 2020

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ENVIRONMENT, CLIMATE CHANGE AND LAND REFORM COMMITTEE
6th Meeting 2020, Session 5

CONVENER

*Gillian Martin (Aberdeenshire East) (SNP)

DEPUTY CONVENER

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

COMMITTEE MEMBERS

*Claudia Beamish (South Scotland) (Lab)
*Rachael Hamilton (Ettrick, Roxburgh and Berwickshire) (Con)
Angus MacDonald (Falkirk East) (SNP)
*Mark Ruskell (Mid Scotland and Fife) (Green)
Stewart Stevenson (Banffshire and Buchan Coast) (SNP)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Tom Andrew (Committee on Climate Change)
Professor Keith Bell (Committee on Climate Change)
Douglas Millican (Scottish Water)
Professor Simon Parsons (Scottish Water)
Dame Susan Rice (Scottish Water)
Chris Stark (Committee on Climate Change)

CLERK TO THE COMMITTEE

Lynn Tullis

LOCATION

The Robert Burns Room (CR1)

Scottish Parliament

Environment, Climate Change and Land Reform Committee

Tuesday 25 February 2020

[The Convener opened the meeting at 09:32]

Decision on Taking Business in Private

The Convener (Gillian Martin): Welcome to the Environment, Climate Change and Land Reform Committee's sixth meeting in 2020. I remind everyone to switch off their mobile phones or to put them in silent mode, because they might affect the broadcasting system.

Agenda item 1 is to decide whether to take in private agenda items 4 and 5—consideration of the evidence on the Committee on Climate Change's annual progress report and consideration of Scottish Water's investment plan. Do members agree to do so?

Members *indicated agreement.*

Committee on Climate Change (Annual Progress Report)

09:32

The Convener: Item 2 on the agenda is to hear from the Committee on Climate Change on its annual progress report. I am delighted to welcome our three colleagues from the Committee on Climate Change: Chris Stark is its chief executive, Professor Keith Bell is a member, and Tom Andrew is a senior analyst. Good morning to you all. We have 90 minutes, which, as I said to my colleagues earlier, seems like a lot, but we have a lot to cover. We will ask you lots of questions and get your feedback on things, but there will be a lot that we will not manage to cover. Based on how the conversation goes, we will follow up with questions after the meeting. I am sure that you are prepared for that.

What is your assessment of the direction of travel and the progress that Scotland has made to date? Perhaps you could include the signifiers in the budget for addressing emissions.

Chris Stark (Committee on Climate Change): Good morning, and thank you for having us.

As you suggest, Scotland is now making good efforts to do the things that need to be done in order to get to net zero emissions. That is to be celebrated, although we have not yet seen that in the numbers. Tom Andrew will give a quick update on the numbers; we can then reflect on the actions that lie underneath them.

Tom Andrew (Committee on Climate Change): The latest data that we have for Scotland is from 2017 because a two-year lag is built in to the process of collection of the statistics. In that year, emissions were roughly half what they had been in 1990—they were 47 per cent lower than 1990 levels, at 40.5 megatons—and there was a 3 per cent fall in the year.

The trend over the past decade is positive. Scotland has made a big reduction it its annual emissions, but almost all of that is to do with the power sector, in which there has been more or less an entire fade-out of fossil-fuel-fired power generation. That is excellent, but if Scotland is to continue to make progress, that transition needs to happen in other sectors across the economy.

Transport in particular is a sector that we see going the wrong way: its emissions have increased year on year for the past four years. When aviation and shipping are included, transport accounts for nearly two fifths of emissions in Scotland today.

Chris Stark: The story that that tells is that Scotland is slightly ahead of the rest of the United Kingdom and has completed the first chapter on what needs to be done—in particular, in the power sector, with coal. That is reflected in the statistics that we use in the report.

Now we need to look at a different set of stories. From my perspective, that is why the recent budget is a good development; we are now moving on to the stories in all the other sectors. However, we have not seen the update to the climate change plan, which will be the really big moment this year.

It feels like our report from last year was a staging post for us. We are reflecting on the story that Tom Andrew told about the closure of coal-fired power and the really positive story about the power sector, and we are trying to tee up what needs to happen in the other sectors. The budget was part 1 of that, but I am excited about what might come next.

The Convener: We will move on, but later we will ask for your views on what should be in the climate change plan.

Finlay Carson (Galloway and West Dumfries) (Con): It is great to have really ambitious targets and to celebrate them. They are what everybody would want. However, being realistic, I note that greenhouse gas emissions have fallen by only 3 per cent while the net amount that was measured has actually increased by 4 per cent. That is in comparison with a 10 per cent fall in 2016. You have already said that Scotland's emissions reductions are mostly down to the closure of coal-fired electricity generation, so are we hearing a bit of bravado here? Is Scotland really doing as well as we are led to believe, when the figures suggest that it is going to be incredibly difficult to reach the targets for 2020, never mind the 75 per cent reduction by 2030?

Chris Stark: I have been called many things, but I am not sure that I have been accused of bravado.

Finlay Carson: I do not mean only you.

Chris Stark: Scotland is doing well, but the premise of the question is right: we cannot rely on one sector if we are to keep delivering emissions reductions. What will come next will be really hard.

A set of challenging questions that are related to policies beyond those on the power sector will be difficult for Scotland to address alone, given that some of the relevant powers are reserved. However, even with the level of ambition that we are happy to have seen in the recent budget, we are not yet in a place where we can say that we have the right prescription for net zero emissions overall in Scotland. I do not know whether Keith Bell agrees.

Professor Keith Bell (Committee on Climate Change): It is clear that we banked the emissions reductions from the closure of coal-fired power generation, but we cannot close it again. That does not mean that emissions reduction in the power sector is finished; a big contribution to the whole UK's reduction will still come from that sector.

Buildings and transport are big areas, though, as Tom Andrew highlighted. Transport emissions have gone up, so there are major things to be addressed there. Energy use in buildings is another of the big things, as is land use. We published "Land use: Policies for a Net Zero UK" not long ago, which raises some big questions. This is a good time to raise them, as we reflect on what will come after the common agricultural policy and as we think about land providing public goods, as well as private goods such as crops and so on. The subject has to be seen in the round. It offers major opportunities to reform policy, not just in respect of greenhouse gas emissions reduction, but on biodiversity and on how good land management is funded.

The Convener: The budget contained a big announcement about peatlands restoration. If you saw the evidence from the Cabinet Secretary for Environment, Climate Change and Land Reform last week, you will know that she is tremendously excited about it. How significant is that?

Chris Stark: Peatlands restoration is significant. It alone will not get us to net zero emissions, but it is an area in which we can get a quick win, so it is very good to see the Scottish Government funding it. It is something that we have been talking about for a long time in my appearances before the committee.

The announcement should be celebrated. I would like to see more such announcements because they have a strongly positive impact—and not just on the climate. They show the kind of ambition that we need throughout the Scottish Government's programme if we are to achieve net zero emissions. There are always opportunities to go further; the peatland restoration programme that was announced in the budget is one of them.

The Convener: We are going to address the net zero emissions target. Mark Ruskell has questions on that. Then, we will talk about the climate change plan.

Mark Ruskell (Mid Scotland and Fife) (Green): On the radio a few weeks ago, Chris Stark said that

"Talk of world-leading targets is cheap".

Could you expand on that?

Chris Stark: I stand by what I said. To put it simply, it is easy to set a target but hard to meet it. The 2045 net zero emissions target is, in effect, the same as the UK's 2050 target; it is just a measure of the progress that Scotland needs to make if the UK as a whole is to meet net zero emissions by 2050. I am delighted that we have net zero emissions targets across the UK and I am very pleased that the target is for 2045 in Scotland, but we now need actions that will move us swiftly towards achieving the targets. In the end, that is all that matters.

I am content that the Scottish Government uses the target as a measure of its ambition, but I expect the UK Committee on Climate Change to look increasingly at progress towards the target, rather than at the target itself. That was what I was trying to emphasise when I said that talk of world-leading targets is cheap.

Mark Ruskell: There will be all-important action that we need to take in the next 10 years. In which areas are we currently not on the right trajectory to meeting the 2030 targets, and where do we need to increase ambition? In which areas will we, with continued progress, meet the 2030 targets, which we can then use as a springboard to 2045?

Chris Stark: There are examples in every sector and there is a different story in each sector about what needs to happen. I do not want to give the impression that the power sector has no more work to do. We have significantly decarbonised it, but we now need to increase the amount of electricity that is generated without carbon.

Keith Bell has highlighted land use and the agriculture sector, which is an area in which most policies are devolved, so responsibilities lie with the Scottish Parliament. Scotland needs to pick up the pace of emissions reduction in that sector, and has the capacity to do so.

Tom Andrew mentioned transport. There is a fundamental question about what we will do about surface transport. We have options for replacing the petrol and diesel vehicles on our roads, but it is not right to focus only on that strategy. We must think about how we can cut demand for car transport. At the moment, there is excessive driving on our roads.

The biggest and hardest challenge of all is in domestic heat, which is still largely fossil fuelled. We have a good set of options for how we can decarbonise the housing stock in Scotland and across the UK, but we do not have a comprehensive plan that will get us there. I will say a bit more about that.

Scotland is setting the template for the rest of the UK on what to do about domestic heat—specifically, how to address and improve the energy efficiency of housing stock. That is fantastic. We need a comprehensive strategy alongside that for decarbonising heat in buildings because we have not seen enough progress there. That is something for the Scottish and UK Governments to worry about.

Mark Ruskell: Is the balance between investment in energy efficiency and decarbonisation of fuel sources right?

Chris Stark: That is a very good question, but I am not sure that I can answer it. Through the devolved levers that are available to the Scottish Government and Parliament, we are now rightly seeing emphasis on energy-efficiency needs, which we have been making a lot of down south because we can point to the Scottish prescription for improving energy efficiency of the building stock and say that it looks like a really good recipe for the whole UK.

We are not nearly close to having the right kind of investment in decarbonised heat that we will need. There is a window to address that and to put in place good plans that I hope we take.

09:45

Mark Ruskell: Is the £50 million that was announced in the draft budget enough to get us there?

Chris Stark: No. Again, it is a good start, but it is not enough. The amount is not the right sort of scale.

Mark Ruskell: Is there a risk that we will not meet the 2020 target?

Chris Stark: There is, of course, a risk that we will not meet that target. I think that we are sitting at a 51 per cent reduction from 1990 levels at the moment. Tom Andrew will comment on that.

Tom Andrew: The target is measured against an adjusted inventory. To account for year-on-year changes to the methodology, the target year is compared with the inventory that was present in the year in which the target was set, which makes Scotland's target progress a little more resilient. In real terms, the most recent picture of what we think is happening on emissions in Scotland is that there has been a 47 per cent reduction from 1990 levels. Against the target-setting inventory, that means a 51 per cent reduction, which means that, between 2017 and 2020, it is necessary to find five percentage points of additional reduction.

That timescale means that things that are happening in this year are more likely to have an impact on whether the target is met than big structural change. For example, the mild winter weather at the start of 2020 will have an impact, as will economic output and the amount that people fly this year. Those kinds of things will

determine whether the target is met. Although the 2020 target is important—we will report on it and we hope that it is met—the long-term focus is the crucial thing, because that will allow us to measure whether real progress is being made.

Mark Ruskell: I understand that the target of a 75 per cent reduction by 2030 will be closer to 83 per cent, because of the revisions in the inventory relating to wetlands. Is that right?

Tom Andrew: The 75 per cent will already account for those things. In our report "Net Zero: The UK's contribution to stopping global warming", we recommended a 70 per cent target for 2030. That was based on a trajectory that included those inventory revisions, which accounted for things such as peatlands and global warming potentials being updated in line with Intergovernmental Panel on Climate Change guidance. The peatlands issue will undoubtedly make the target look harder, because in effect it is a block of emissions that are not currently on the inventory but will be added, and you will then need to start doing additional abatement on top of that. It will be a challenging target to meet.

Chris Stark: Meeting the target will be very challenging. I cannot emphasise too much that the target of a 75 per cent reduction by 2030 is extremely challenging. Scotland has halved its emissions in the past 30 years, which has been a slog, but the new target requires us to halve them again in the next decade.

As Tom Andrew said, in the "Net Zero" report, we mentioned a 70 per cent target, which was based on a straight-line pathway from now to net zero. We need to consider what the whole pathway will look like. It might end up being a straight line, but it might not. That will depend on the extent to which emissions reduction can be front loaded. The front-loading options that we had 30 years ago are not available now. As Keith Bell said, power sector emissions are not going to fall again. Therefore, achieving the 75 per cent target will be really extremely difficult. Parliament set the target, but it was not done on the basis of detailed technical advice. We will return to that when we offer advice on the full UK pathway later this year.

Mark Ruskell: Will that look at individual sectors and the changing emissions inventories?

Chris Stark: It is my ambition that this year, for the first time, we will build a set of sectoral pathways right out to net zero. We have not been able to do that yet, but it will allow us to look at the sectoral pathways here in Scotland. In the work that we have done to date, at UK level the pathway looks like a straight line, but beneath that is a set of much more interesting sectoral pathways. It is simply that the law of large numbers gets us to a straight line overall. Looking forward, I do not know whether that will be the case; frankly, I am excited to find out. It is something that we are looking at now.

Mark Ruskell: Thanks. We are excited to find out, too. That is great.

The Convener: People need to brace themselves for the outcome of that, because—as Chris Stark said—a 70 per cent reduction was the recommendation that was given.

Chris Stark: Yes.

The Convener: The conversation will have to turn away from targets and on to what achieving them translates into.

Chris Stark: Targets keep us on track. What matters between now and achieving net zero emissions is the area under the curve. The quicker we can bring it down, the better for the climate.

The interim targets in Scotland and the carbon budgets—as they are known at UK level—are your guide. They present the glide path to overall net zero emissions. They should be set on the right path to make them achievable, feasible and ambitious. That requires us—this is why you have a CCC—to look carefully at what needs to be done in each sector and to build the sectoral pathways that allow us to set the overall target.

As the convener said, what really matters are the actions to deliver the target, and not the target itself. I think that this will be the year when the CCC as an institution will move beyond looking at the targets as our major focus and towards delivery and action. It follows that we should be moving away from the targets and on to the actions themselves, and becoming—if we can—the independent experts on what works.

Claudia Beamish (South Scotland) (Lab): I will push a bit further into the discussion about the 2030 interim target. I hold up my hands as being the person in whose name the stage 3 amendment to the Climate Change (Emissions Reduction Targets) (Scotland) Bill happened to be lodged, although it was agreed to across the parties.

I am absolutely clear that I greatly respect the work of the CCC. In the balance when thinking about pushing for the interim target to be 75 per cent there was also the IPCC's recommendation that there should be rapid transformational change. A number of other reports—such as the Vivid Economics report—and developing research came out.

I am a layperson, but beyond the technicalities, I believe in political drive and in the possibilities in all sectors to inspire and oblige. I think that Chris Stark said that it will be "extremely difficult", or even more—

Chris Stark: I said “really extremely”—it was a terrible contortion of words.

Claudia Beamish: I am interested to know how soon—or, indeed, whether—you will be able to help us with sectoral targets and behaviour change proposals for meeting the 2030 interim target. When might that help be available?

Chris Stark: There are lots of things to say about that. My worry about the target is not that we should not have ambitious targets but that we should have targets that can be meaningfully achieved. There are a number of factors in that. The quicker that we cut emissions, the better it is for the climate. The obvious point is that having an ambitious target helps with that—at least, it should do.

My worry is that the target might be a bridge too far—that is the concern. I say that not because I feel that we should not have a drive towards cutting emissions as quickly as possible but because some of the elements of achieving that target do not sit with the Scottish Government. Therefore, if it is vastly out of kilter with what the UK as a whole is trying to achieve—in particular, if the big energy infrastructure questions will not keep pace with it—you may well get to the point where, to meet that target, you have to do what economists might call “suboptimal” things that might not stick and they might not be the right actions overall.

My main plea to the whole Scottish Parliament is that you wait and see what this looks like. You can expect from the CCC—as you should—a huge amount of ambition around what needs to happen over the next three decades and, in particular, around the steps that need to be put in place over the next decade.

Some of that will have deep connotations for what can be achieved in Scotland. The future of the gas grid, for example, is an obvious place in which to look for an opportunity to cut emissions. I do not know what the UK strategy as a whole will be for closing or keeping open the gas grid over the next 10 to 20 years, but I know that it will be significant in the Scottish story. My worry is that you have a target that cannot be met and that that undermines the framework in Scotland for cutting emissions overall.

Professor Bell: We are either setting up for failure and the political disadvantages that that would bring or, in striving so hard to meet the target, we are closing off options that might be better for the longer term. As Chris said, there are particular questions about the future for gas and the extent to which hydrogen will replace methane in meeting energy needs, whether in fuel cells in heavy goods vehicles—it seems that that must happen at some point—or in heating buildings. In certain locations where there is an ability to manufacture hydrogen in a blue or green way, that might be achievable in the late 2030s or the 2040s. Looking at it from the 2050s, that might look like the best way to go. However, if in order to meet the 2030 target there is even more electrification—there has been a lot of electrification anyway—we might regret doing that. Hybrid solutions in the interim might well be the way to get through that situation, although a further replacement of capital stock would be associated with that. As Chris said, there are big questions about what happens to the gas network or, rather, gas networks, because we could see different solutions in different places.

Claudia Beamish: We are where we are. I take it that your recommendations will help us to assess what actions would be suboptimal if we are looking beyond 2030 at the whole trajectory, as well as how we arrive at the 2030 target.

Chris Stark: The next decade is the most important decade, because it is when we have to put the right conditions in place to deliver on the targets. I would love Scotland to be as ambitious as it can be over the next 10 years. Some of those decisions lie firmly in the gift of the Scottish Parliament, but some lie elsewhere. It is perfectly acceptable for Scotland to have as ambitious an emissions-cutting plan as it can, as well as to have a position on what it would like to happen at Westminster. However, some of that will depend on decisions that are taken outside Scotland, so that must be measured and balanced out.

My interest is in providing the committee with as much clarity as possible about what needs to be done, particularly over the next 10 years. In the work that we are doing at the moment, we are looking at the sixth carbon budget for the UK, which takes us into the period of 2033 to 2037. It is an important moment for us as a committee and in setting the target, because it will be the first of the interim targets at UK level to be set after the net zero goal was set, and it is the major UK-wide target that will determine the path of UK emissions between now and 2050. That will have implications for Scotland, too.

It would be fine for us to simply recommend a level for the sixth carbon budget in September, but that is not very interesting. I am much more interested in spelling out the conditions that will need to be in place to achieve it, which we are looking at through a scenario-based exercise. We look at the mixture of behaviours and technologies that will be necessary to cut emissions as quickly as possible, and we can draw from that what the Scottish story will look like. We can even play around with that, with Scotland starting earlier on some of those elements. We will be able to

provide a great deal of detail at the end of the exercise, which should be helpful, I hope.

The Convener: We have alluded to the climate change plan many times throughout the conversation that we have had with you. It is obvious that the climate change plan, as it is now, is not sufficient in terms of our new targets. We do not have to go over that.

You mentioned the priorities for action—transport and the heating of homes, in particular—and the difficulties that exist due to the reserved areas that will impact on those two priorities. Thinking about what we can do in the Scottish Government and in the Scottish Parliament, I would like to ask you to help us, in a way. We have made it clear in our recommendations that considerations around net zero should not just lie in silos such as this committee and this Government portfolio. What is your view on how we can embed net zero across portfolios in terms of Government action and parliamentary scrutiny? How important is that to realising some of our ambition?

10:00

Chris Stark: I will kick off, and Keith Bell can chip in with his reflections.

One of the most interesting things that has happened since last year's net zero report led to the target that Scotland now has is something that I had not predicted: the signalling impact of net zero. Scotland used to have an 80 per cent target, which left open the question, "Am I in the 20 per cent?" Last year, when we recommended the net zero target, we were clear that it was the right target but we underestimated the impact that it might have as a signal or call to arms, if you like. I think that everyone in the system now recognises that they have a part to play in reducing emissions, which is fantastic.

However, I agree with the way that you framed that question. Net zero will not be achieved if we look at the problem as a set of siloed questions about how to cut emissions. Some of the steps to achieving net zero overall are what we might call system-wide challenges. We have talked about domestic heat a lot, and it is a good example of such a challenge. It needs a good, strong housing policy and a set of energy policies to get there. Crucially, it will also need a set of steps to keep the consumer or the citizen informed about what will happen and to keep them engaged with the process of delivering it. That will not happen through the Scottish Government housing directorate setting a policy; it will happen through strong leadership from our politicians here, in the UK, and strong policies right across the system.

We see those system-wide challenges everywhere. One that is particularly important is the land use challenge. We know that, to get to net zero, we have to change the use of land across the UK and here, in Scotland. Interestingly enough, that rests on diet, which is a fascinating question from my perspective. The extent to which we can shift the use of traditional agricultural land to something else rests, in large part, on what we consume.

System-wide challenges need to be viewed as such. We need an integrated plan that looks right across all sectors, picks out these things, and makes good, strong plans for the next 25 years, not just for the next parliamentary session. That is the opportunity in the coming update to the climate change plan and the eventual new climate change plan that we will see thereafter. The legislation in Scotland and across the UK requires those long-term systemic plans to be put in place, and they will need to look beyond any one parliamentary session.

I suppose I am going back to my earlier point in saying that this is the opportunity to put those conditions in place so that we get the right outcome.

Professor Bell: Absolutely. In some ways, the sectoral pathways do not necessarily help to make these interactions clear. They are really important reference points that help us to see what is going on and what the outcomes of policies need to be.

To deliver those outcomes, a different set of combinations will be needed. Chris Stark mentioned a whole bunch of things to do with reducing the greenhouse gas emissions that are associated with the use of heat. I would add another important point to that list: skills. We are talking about installing a lot of heat pumps, for example. Unlike a lot of the global market for air-to-air heat pumps, we are talking about air-to-water heat pumps to fit in with existing heating systems in buildings. In turn, that will require the right kind of specification and setting up of the systems so that they can be installed in the right way.

A body of expertise therefore has to be in place to install those systems, and it has to be in place from the beginning, otherwise consumer confidence will not be built up. Once people see these systems and get used to using them, and once word spreads about how it all happens, we can establish a momentum.

Setting an ambitious target helps to set the momentum that we want to achieve, but that must be backed up by appropriate budgets in all those areas.

There is a cost element in ensuring that those things are provided, but the teaching has to be

right and the curriculum has to include the right things. To a large extent, that is in further education colleges, which are a slightly Cinderella sector of education.

That the installations have worked also has to be checked. There is a cost in supporting and in evaluating that things have been installed in the right way. A major part of the CCC's advice recently has been to have no new homes on the gas grid from 2025. Here, we are talking about 2024, which is very good. Members can imagine that the big housing developers will build things for the least cost. The regulations therefore have to be appropriate, but whether they have met the regulations must be tested. That means random sampling rather than someone just being led to one demo house and saying, "Oh yeah, everything looks fine."

Such things have to be embedded across different policy areas. I am not sure about how the approach should be structured in respect of committees and Government departments looking at this, that and the other. At least the Government departments in Scotland have the opportunity to talk to one another more than Government departments in Whitehall do. That should be of great benefit, but the importance of the resources to see that the policy is delivered and to verify cannot be overestimated.

The Convener: That leads on to how specific the recommendations in the climate change plan should be. If they are too high level, we have to ensure that they filter down through the system. Chris Stark was involved in the previous climate change plan in the Scottish Government.

Chris Stark: It was an excellent plan. [*Laughter.*]

The Convener: How can the plan be meaningful and actionable?

Chris Stark: Doing the job that I do is fabulous for many reasons. One reason why I like it so much is that we have a pretty unique role. People think that we forecast, but we do not: we hindcast. We stand in the future and look back. On what people get from the CCC, by law the requirement is for us to look at the world in which we have achieved the net zero target, look back to where are today and spell out what looks like the path of least resistance to achieving the target. When we do that, it is not as complicated as it might appear. Getting to the goal of net zero overall involves a fairly clear set of steps in every sector. The interesting question is how we achieve those steps but, broadly, in almost every sector—bar aviation and agriculture—it is about getting to zero emissions. That clarity of thought should be driven right through the climate change plan.

I would look for something that sets out how we will get from here to there in each sector with a genuinely integrated view. We can play around with the dates by which some of the zero emissions goals should be achieved and we can certainly play around with the actions that are necessary to achieve them, but we have to get there in the end. The central point that I am trying to make is that the clarity that comes with net zero emissions should make it easier to make a plan.

The Convener: So, the linkages between the sectors and the impacts of one sector on another happen in the background, but we have to be quite specific to have an actionable plan.

Chris Stark: We do. It is worth saying that the 2018 plan went into a really good level of detail. That is necessary, and it certainly helps us in the task of appraising the plan.

I make the point again that net zero is a more fundamental target, and it means that we need to lean more heavily on the big system challenges. I am pleased that Keith Bell raised the issue of skills, because skills are a really good example of something that would not jump out at us if we looked only at emission reductions in isolation. There are big, system-wide challenges that need to be viewed in that way. Skills provision, how we use land, and engaging with the public are challenges. There is a whole set of economic and just transition challenges. I would like the plan to look at those things alongside that specific level of detail.

The Convener: I thank Keith Bell for giving some grist to my mill. As a former FE lecturer, I have said for decades that the college sector is the most important sector.

Claudia Beamish: I have a couple of brief questions about the updated climate change plan. I had intended to ask whether you will do a skills assessment strategy, which would perhaps be broader in scope than the updated climate change plan, but given what you have mentioned about system-wide analysis across all sectors, will you do something in that area?

Chris Stark: I do not want to overcommit, but that is something that we are definitely thinking about now. I will expand a bit on what I said earlier. This is probably one of the last moments when setting a target will have a really big impact—we are thinking a lot about that in the Committee on Climate Change, too. As we move beyond setting targets and into what drives action, the barriers to action jump out at us, and skills provision is definitely one of the barriers.

We have seen some bad examples, particularly at the UK level, of pulling away from policies, with a resultant hugely damaging impact. The most obvious one is the UK-level net zero homes

commitment that the then UK secretary of state for housing pulled at the very last minute. That was damaging not just because we no longer had the target, but because the industry that was being built up to deliver it disappeared almost overnight.

I would like my committee to look more at those issues and to present advice on what needs to be done to build the capacity to deliver net zero; necessarily, some of that will be cross sectoral.

Professor Bell: That will also involve different layers of government. We have talked about how, to a large extent, the Scottish targets are dependent on UK actions. The Scottish Government can do a lot. However, other aspects are the local authorities and their interactions, the clarity of policies and where the actions sit—and funding underpins all that. It is a challenge to get right those interactions, but they must be got right.

Claudia Beamish: I have two more questions, which I will ask together, because I know that other members have questions on this and other issues.

First, Chris Stark will know that progress has been made with peatlands—we are in a very good place compared with where we were. I will put my question in a positive way rather than a negative way. Will you be looking at the opportunities to include blue carbon and marine issues as part of the updated climate change plan, or, indeed, as part of future plans?

Secondly, we will get an updated plan. We have a budget to which we are working before we get that plan. I am confused about what will happen if we say that there should be more money for heat—you have said that the £50 million heat network fund is not enough. How will those aspects interrelate? Will you be recommending that that should be for the next budget? Will we wait until the next budget? Do you get the drift of what I am asking?

Chris Stark: Absolutely. You are quite right to ask about blue carbon. Every time you ask me about it, I feel humble, but I do not have the answer. I would like to do something on blue carbon, which is not something that my committee has offered much advice on. We looked at it briefly and considered whether we would include it in our recent land use report, but we felt that we did not have enough evidence. I think that we will probably have to do some specific work on that. I want to manage your expectations, because we are unlikely to make lots of recommendations about it this year.

It is an exciting area. I am always drawn to things on which we do not have good evidence. I think that we can do something on blue carbon, but I do not have a date in mind.

On your broader question, things are really difficult. In one sense, I feel privileged not to be in Government any more, because those are definitely issues on which it will have to grapple with more than we will. We are not here to offer detailed recommendations for what needs to be in every single fiscal event, but it is absolutely true to say that each time Scotland has a budget, and each time the UK sets a budget, those are opportunities to put in place an ambitious set of spending priorities.

However, it is not all about public spending. The more that we look at the issue overall, the more that we think that it is the non-spending levers that matter. Last year, we did a report on net zero. A really great report was done alongside that for us by an advisory group on policy that we formed. It did some great work on non-spend or non-tax levers—we might think of those as regulatory or standard-setting measures—and their overall role. It turns out that those matter more and more.

10:15

It matters immensely that Scotland has set a date of 2032 for phasing out petrol and diesel vehicles and that the UK has recently upped its ambition to phase those out by 2035—or possibly earlier—because the companies that make cars see that and make provision for it.

Those are the kind of announcements—if I can put it that way—that Scotland can make that fit well with the system view that we have talked about and do not require lots of public spending. Even in between the big fiscal public spending events, there are lots of opportunities to set the right laws and make the right regulations to steer us towards net zero.

Professor Bell: The Government sets the context in which private investment happens, whether that is by companies, financial institutions or individuals. That context includes regulations and policy directions. The important thing is that there is a clear direction. As Chris Stark said, step changes are really bad, because the change tends to be sudden and it takes everyone time to gear up and get their heads around it. Also, if the step change is in an adverse direction, confidence in the overall direction is undermined.

As we have said, we have to do a hell of a lot in the next decade, so private investment, on every scale, is crucial. The Government's ability to set that framework, or the constraints in which that investment happens, has a big part to play. For example, we can expect consumer behaviour to adapt to the availability of electric vehicles and electric vehicles will become available because the market is demanding it—the two things go together in the policy ambition that sets the

direction. There is an international dimension to some of those products and markets.

The Convener: There seems to be a narrative around such changes that suggests that they will be painful, but there are many opportunities for individuals if they get the right signals in advance.

Chris Stark: Absolutely. So far, the lesson from cutting emissions in Scotland, and across the UK, has been the lack of pain felt in doing that. It is a remarkable thing that has been pulled off. We would say that it is not enough—but that is what you would expect from the Committee on Climate Change. It has been hard fought, but it has not turned us to penury, so why would we think that it will be different in the future?

I am keen to make the point that, once we have got to net zero, that is it—once we achieve that, it is highly unlikely that we would turn back to using fossil fuels. This is the moment to get that done. That sets us up to be the modern player in the modern economy that we need to be.

The steps ahead of us are not something that we should be afraid of at all. They are worth taking, because the science says so and because a whole host of wider societal benefits will come with them.

Tom Andrew: We have talked about making sure that addressing climate change is everyone's job, across portfolios. A crucial way of securing buy-in for that is to realise that the benefits of acting on climate change also translate across portfolios. Take what has happened to diet and air quality, and with people having more energy-efficient homes and new skills and jobs. Other parts of Government will capture the benefits of all those things, so it is in their interest to take action.

The Convener: Not least in public health.

Mark Ruskell: I am sitting here thinking about infrastructure. The Infrastructure Commission for Scotland has just published a report. It is quite clear that, if we are going to build more road capacity, we need to reduce it elsewhere in the system. It is also clear that we need to focus more on repairing the road capacity that we have. Do you agree with that? It seems to go beyond the advice that you have given previously, which is more about decarbonising cars, rather than about behavioural change and the potential impact of increasing infrastructure.

Chris Stark: There is a really important point hidden in your question. The answer is that we cannot look at infrastructure provision alone. I do not mind admitting that we struggle a bit with the roads question because we are advocating the transition of surface transport to electric vehicles. As I said earlier, if that is all that we do, it will not be a successful transition. We should be looking at the behaviours beneath that.

Surface transport emissions are going up because we are driving more and we are not using public transport as much. We need roads; there is no question about that. However, my advice to the Scottish Government, as it considers its infrastructure strategy, is to look across the piece and ask whether it is allocating the capital investment in the right places, so that it brings about the right outcomes. I would rather that we make even more ambitious provision for charging infrastructure for the cars that might go on those roads, for example.

Mark Ruskell: You talked earlier about hindcasting—seeing the vision and working back. What is your vision for Scotland's road infrastructure by 2030? Do we have more roads? Are they better? Are the potholes filled in? Are we driving more and more miles each year but doing so in electric vehicles?

Chris Stark: I can say with certainty that we are not driving more.

Mark Ruskell: What does it look like?

Chris Stark: We will not directly address the question of which roads go where but, in a net zero world, we will need the road network that we have at the moment. I do not have the answer to whether the network will be expanded or contracted, but it needs to be well maintained.

Mark Ruskell: Would it make a difference?

Chris Stark: Of course it can make a difference.

Mark Ruskell: In that case, why can you not offer advice?

Chris Stark: The specific provision of how much road we require does not jump out of the numbers on what we need to do to cut emissions.

Mark Ruskell: A political decision was made to construct the Queensferry crossing. Obviously, there were important considerations relating to the economy, but that has resulted in a million extra vehicle journeys every year across the Forth, and that is one small piece of road infrastructure. How should we assess the impact of such projects? There is a balance for the Government to achieve when it makes these decisions, but if we are not transparent about how projects might lock in emissions, they could take us in a radically different direction.

Chris Stark: That is one of the reasons why you cannot get a definitive answer on that from the Committee on Climate Change. The answer to those questions is always, "It depends." If we have a rock-solid strategy for decarbonising the vehicles on our roads, then, when it comes to overall infrastructure provision, the question of what road

provision we have naturally falls down our priority list.

Professor Bell: There are massive interactions. A few minutes ago, Mark Ruskell made a point about economic impact, access to workplaces and other facilities, and supporting particular localities relative to others. Those are political judgments on how we balance one area against another and what kinds of investment we make. There are different options for how we support a particular local economy; road transport is one of them. It is difficult for the Committee on Climate Change to get into that level.

However, Mark Ruskell made an important point in asking the question about the transparency of the impacts of the different policy options on greenhouse gas emissions. There are difficult judgments, but the transparency of the greenhouse gas emissions impacts has to be involved in every significant Government decision. That is the important point to come out of the discussion.

Chris Stark: We are looking at three scenarios for achieving net zero, which will form the basis of the advice that we give on the pathway. One of those is an infrastructure-led scenario, which is similar to what we said last year, in which the Government makes provision for infrastructure and big capital assets, such as energy networks. We will also look at two other scenarios: one is a world in which there are more rapid technology developments and there is more rapid adoption of those developments; and another is where there is a more rapid or ambitious behavioural response from the people who live in this country.

We will use those three scenarios to pull out what look like the key conditions of achieving net zero—in particular, over the next decade. We do not want to present options, to which you can say, "I will have that one, please." In the behaviour scenario, we will look more actively at what would be necessary for us to stop using cars, for example, in the short term. What harder-edged things would nudge us towards getting people out of their cars and into public transport? However, we will have to be able to substantiate and evidence that. Often, the behavioural scenarios look appealing because they are cheaper. From my perspective, that would be great, because the cheaper the overall transition is, the more likely it is to succeed. However, it has to be something that we can evidence; you can expect that from us in the next year.

The Convener: We will talk about behaviour change in a minute. Before we do, Finlay Carson has a final question on the climate change plan.

Finlay Carson: Professor Bell, you mentioned the importance of everyone working together because, obviously, the UK Government's objective of reaching net zero in 2050 relies on the Scottish Government delivering strong policies in its devolved areas, and the Scottish Government will also rely on local authorities doing their bit.

We always hear that we must go further and faster. We have 10 years to deliver a 75 per cent reduction. That is ambitious but, as we keep on saying, such goals also need to be achievable. How detailed and specific does the climate change plan that is coming up in April need to be—with regard to directing local authorities and so on—compared with what we had in 2018?

Professor Bell: As your question implies, having that level of detail is important. Different areas have different opportunities, of course. Densely populated areas look like better candidates for district heating. However, district heating is not a solution in and of itself. It enables a more efficient use of energy, but a low-carbon source of energy must be available, too.

Local plans are important for the provision of electric vehicle infrastructure—we just talked about transport, investment in roads and so on.

There are a lot of good intentions around local energy planning, but different areas are starting from different points and are in different circumstances. Access to data and people's expertise in using that data are particular challenges. Who is responsible for developing a plan and have they got access to the data that will tell them whether the plan is a good one? Various people are involved in that area. For example, Energy Systems Catapult provides a service that helps local authorities do that kind of thing. However, that service is incredibly intensive and requires a lot of data to be gathered and detailed modelling to be done. That takes a long time and, when the plan comes out, people cannot understand what it means and cannot say how sensitive it is to different factors.

Work is going on across the sector to get the right level of support and tools to inform all that. Of course, that plays into the issue of what is available to civil servants in the Scottish Government who are trying to put together the climate change plan. What do they have access to that will enable them to understand the various circumstances? The situation is better than it was. As I said, the tools and the data that are needed in order to firm up some of the assumptions that will inevitably have to be made must be put in place, too.

Rachael Hamilton (Ettrick, Roxburgh and Berwickshire) (Con): You have touched on a number of behavioural changes that people will have to enact over the next decade. What do you think will be the most significant changes that

people will face, and what challenges will that present in their daily lives? How will you engage with people to win their hearts and minds?

Chris Stark: That is probably the most important question overall. To be humble for a second, I do not feel that we have all the answers to that. It is something that I would like us to be increasingly better informed on. The question of how to engage citizens in what needs to be done to get to net zero lies at the heart of whether we will have a successful transition. We have seen a great deal of progress so far in cutting emissions, but we have not seen a lot of that kind of engagement.

It does not matter to the average citizen that, this year, half of the electrons that they receive through their plug are zero carbon; what they care about is that the kettle still boils. What lies ahead will involve a fundamentally different approach in that regard.

I would like us to have a proper and open discussion of the issues. There is a citizens assembly happening in Scotland, and I am sure that that provides a good way into that discussion. I am also pleased that the just transition commission, chaired by Jim Skea, is considering the fundamental questions about what we do in relation to employment and the transition that is necessary for us to get to net zero. Both of those processes will give us new evidence that our committee can use in our assessments.

What is fundamentally true is that an element of behaviour change runs through everything that we are doing. Actually, I do not like the term "behaviour change", because it implies that there is poor behaviour. Behaviour just is—it is what we do. I would like us to be more creative in thinking about the ways in which we push people towards outcomes that benefit the climate and away from those that do not.

10:30

A philosophical point here is that this is the only big system change that I am aware of for which we think the answer is to tell every actor in the system about the overall goal. You would not find that in health provision, for example. If you cared about the productivity of the national health service, you would not go to people in every layer of it and ask them to be more productive. Climate is a bit like that, too. We need to break it into the meaningful things that will get us to the goal, and then consider what motivations are necessary to deliver it.

When we look at what we need to do, a whole host of things jump out as being important. One that I have mentioned is diet. Diet is important because it is also linked to health, which is a good thing to think about. We do not really have good evidence on what changes people's diets. You may think that, in the age of the vegetarian, which we are in at the moment, we have seen big changes in diet, but we have not. The land use report that we published recently had in it a core scenario of a 20 per cent reduction in the consumption of red meat and dairy. We were hauled over the coals by some of the environmental community for being unambitious in that regard. However, over the past 20 years, there has been a 6 per cent fall. It is such an important element of the overall strategy for land use that we need to think about what policies will get us to that outcome. It requires active thought, and it is not a popular thing to discuss if you are a politician.

You can find behaviour changes in all the other sectors, too, and it is worth saying that some are easier than others. People might not be filling up their car at the pump but plugging it in instead. That is a behaviour change, but I do not think that we should be too afraid of it, as long as the infrastructure provision is there. People's homes are still going to be warm; it might just be that it is a heat pump rather than a gas boiler that heats them. That is a behaviour change, but it does not seem as difficult as shifting national-scale patterns of diet.

My other point is that we should try to pick out the things that we see as critical to the overall transition. Keith Bell made a good point about skills provision, which I see as a key condition of successfully achieving net zero. We need to focus on those things and think about what shifts in behaviour will be necessary overall.

Professor Bell: The linkage with skills is that, for users of services, such as the installation or maintenance of their heating system or having someone look after their car, or for those buying farmers' produce off supermarket shelves, if the right skills are in place, the changes become quite easy. The aim is to make it as easy as possible, so that people are not frightened by the changes. Any change can look scary at the beginning, but we can also underestimate our ability to adapt. Maybe one of the tricks is to be conscious of segments of society for whom change actually is very difficult, such as people who are in vulnerable situations, people who do not have much spare money to adapt to different things, and people for whom it is challenging to get to their workplace.

Most of us can probably make the changes if they are made easy. If the installers of a heat pump know how to do it right and people are warm without having to think about it, that is good. If the EV charging infrastructure is there, it will be easy for people. The people who do not have EVs still have to get around, so we have to make the

transport provision as good as possible, so that people do not have to think about it. There is no reason why software cannot be written in a way that makes smart controls for heating and lighting a building easy to use. Most of us are used to using mobile phones now, but there is still a small segment of society who do not use them and who do not have access to the internet or certain services. A key societal challenge is to make sure that we bring everybody along.

Rachael Hamilton: That is one of the observations that have been made.

Chris Stark gave a very full answer, which answered lots of the questions that I was going to lead on to. He talked about making the changes affordable. It is about making sure that the cost of meeting the climate change targets is spread out across not only cities but rural areas. We know that people in rural areas use fossil fuels more—they use their cars more. They perhaps have access to beef, lamb and dairy products, like to support their local farmers and are interested in the provenance of the produce. I am not sure whether this will make it more difficult or more costly but, given that I, like many other members of the committee, represent a rural constituency, I think that we need to ensure that there is rural proofing and that the costs of decarbonisation are spread across the whole UK.

Chris Stark: I could not agree more. The postscript to that is that we can absolutely do that. We have not yet stepped back and asked the fundamental questions about how we achieve net zero fairly. I think that Scotland is further ahead than the rest of the UK in considering those questions, particularly because of the establishment of the just transition commission.

I am delighted that the Treasury is undertaking work this year on how we fund net zero and, crucially, how that is done fairly. That needs to reflect a whole host of fairness dimensions. One of the things that are often lost is a discussion about rural and urban areas. Too often, we assume that everyone lives in cities, which is not the case. There is a valid and important reason for the use of fossil fuels in rural communities that are not connected to our big cities, which necessarily means that we need to think more carefully.

I want to put some numbers around an earlier question that I was asked. One of the great things that we did last year was stepping back and asking what behavioural change needs to deliver. I have UK-wide stats, but they will hold up in Scotland, too. We looked at how we get from where we are today to net zero, at what proportion of the necessary emissions reductions will be due to technological improvements alone, and at what behavioural change is necessary overall. Thirty-eight per cent—let us call it 40 per cent—of emissions reductions to get to net zero involve low-carbon technologies or fuels alone, and the rest involve elements of societal behavioural shifts.

The more we promote positive climate behaviours, the cheaper the costs will be overall. That is a good clue that what comes next will be as much about the challenge of developing, rolling out and using new technologies as it will be about behavioural shifts. The lesson of history is that we are less good at engineering behavioural shifts through policy than we are at adopting new technology.

Professor Bell: It is, of course, important to recognise the differences between rural and urban areas. That links back to the need for local policies to be appropriate for particular areas. We have talked about transport quite a bit. In cities, to a large extent, we should encourage people to come out of their cars and on to public transport, and to walk for shorter journeys, whereas EVs will have an important part to play in more rural areas, and we need to have the infrastructure to support that.

It is great if people in rural areas are concerned about the provenance of the food that they eat. That sets a good example that we should all follow. Although the central scenario that we have drawn up in the net zero advice and the land use report talk about a relatively modest shift in diet, that has to translate to the land use of this country. We should not use imports as replacements, because that might make the situation worse. Provenance is important and links to modest or, possibly, greater shifts. As we touched on earlier, we need to look at the totality of policy on land use, so that public goods more broadly, not just food production, can be considered and rewarded appropriately.

The Convener: We have been talking about the challenges that all sectors face, but members have questions about the challenges that particular sectors face. Finlay Carson will talk about agriculture and land use.

Finlay Carson: I am going to contradict myself. All agriculture activity results in only 9 per cent of emissions, beef and other meat production contributes only 3 per cent to output and the total emissions from agriculture and land use have fallen by 75 per cent since 1990. I cannot understand why we are talking about agriculture so much.

I am concerned about the emphasis on diet change, given the low figures that are attributed to food production and given that, each year, 1 million tonnes of food and drink are wasted in Scotland. I think that the emphasis is in the wrong place.

I think that where we are with agriculture has a lot to do with the common agricultural policy. We have crops and agricultural production in places that are not best suited to that.

Public money for public good is important. Our land use strategy must be for the public good. Where is Scotland in relation to public money for public good, compared with elsewhere in the UK? If I remember correctly, that was a concern last year. Have we moved forwards in addressing that issue?

Chris Stark: No, I think that we still have the same concerns. I definitely consider that we are having a discussion about that, which is a good development.

I do not recognise some of the statistics that you mentioned. There is an issue with agricultural emissions—they are flatlining and not falling as they are in other sectors. That is largely to do with livestock.

You are absolutely right to pull out some of the wider factors; indeed, that is the basis of the advice that we gave in the land use report and the net zero report before that.

There needs to be a fundamental shift in land use—we need to have a change in land use at the heart of the policy prescription in Scotland and across the UK. I am afraid that we do need to reduce the numbers of livestock, but we do not need to do very much of that if we do it properly.

From my perspective, it would be a disaster if we start importing from places that have even higher greenhouse gas emissions. We have goods stats on land use support. Those show that, in places such as Indonesia and Brazil, where is the scope to deforest more and create new areas to graze cattle, doing that has a catastrophic impact on greenhouse gas emissions.

On the importance of diet, as Keith Brown said, a 20 per cent shift would be modest. We have not engineered that in the past 20 years. If we were to pull that off, overall, that would give us enough scope to turn over the agricultural land for natural carbon storage, especially through growing trees.

Finlay Carson: We are sitting at about only 75 per cent self-sufficiency in meat production in Scotland, but we are talking about diet change that will be very difficult to achieve—and which we will not achieve over the short term. You have already said, even though there is—apparently—a growing movement towards veganism and vegetarianism, which is widely reported in the media, would it not be better to ensure that, when people make dietary choices, they buy local? People should choose to buy beef and lamb that is produced in Scotland. The effect of that could be felt far more rapidly.

We are looking for quick changes over a much shorter time. Would it not be better to put in place policies that ensure that people eat locally produced products, rather than requiring a dietary change? Consider just transition, people's incomes and so on. We could find that the price of locally produced food goes up, leading to an increase in cheaper imports, which have a far higher carbon impact. We cannot offload matters; we cannot look at the issues in silos.

Chris Stark: The short answer to your question is yes, you are right, but we still must have a reduction in methane emissions. That is necessary if Scotland is to achieve its net zero goal.

Most of the meat that we eat is processed. Eating good-quality meat is absolutely in line with what we are proposing. This is not a prescription for radical vegetarianism; this is about cutting back a little bit. As I have said, Scottish beef and lamb produce among the lowest greenhouse gas emissions intensity of any meat reared anywhere in the world. Therefore, it follows that you can eat local. However, we still have to eat a little bit less meat, which is a key condition of freeing up the land for the alternative uses that I have mentioned.

To return to your earlier question, an improvement in agriculture is fundamental to our advice. That is about having more productive agricultural practice, which is usually low carbon. A set of other things underneath that will be necessary—the most obvious is turning over that land to alternative uses. We do not have a policy prescription that will achieve that in Scotland, nor do we have as principled a basis for doing it as the Department for Environment, Food and Rural Affairs has introduced at UK level. It has introduced the idea of public money for public goods, but I understand that Fergus Ewing is not keen on that. We can shoehorn the environmental objectives into the existing system of agricultural payments in Scotland, but that is hard, so the sooner we understand how it will be done, the better.

10:45

Professor Bell: I re-emphasise that net zero in 2050 means that every sector has to make big shifts. Although agriculture might look small as a proportion now, by the time that we get to 2050, it will be a very large proportion. With the policy options that Finlay Carson set out, it is not a question of either/or—we need both. On the provenance question, people should absolutely buy local, but we also need relatively modest shifts in diet. It is not radical stuff. Years ago, when I was finished being a student, I moved into a house where the rule was that everyone was vegetarian, which was a bit of a shock to me. There is not much of me to start with but, within six months, I

had to pull my belt in two notches. I would not advocate that kind of thing, but the shift is still good for us.

Finlay Carson: We welcome the agricultural transformation fund of £40 million in the budget. We also had a big announcement on peatland restoration, which the cabinet secretary was very excited about, and we have planting targets. Is the £40 million enough for the transition in agriculture? Are we ambitious enough with our peatland restoration? Your report suggests that we need between 15,000 and 24,000 hectares of new tree planting, but the Scottish Government is looking to plant only 12,000 hectares. Are those measures sufficient if we are to achieve the 75 per cent reduction in 10 years' time?

Chris Stark: I will ask Tom Andrew to run through some of the statistics on that in a moment. The agricultural transformation fund is a good development and is a clue that things are moving on the issue. It is a positive step, but it is not the systemic and systematic shift that we need. It is a good start, but we need more. You would expect us to say that, but the issue is particularly important because, if we do not have the underlying shift in land use, net zero will quickly be out of sight, as it takes time to grow a tree. This is pretty important stuff, and if we do not get it right in the next five to 10 years, we will not be able to use our land in the right ways to get to net zero overall.

The key priorities include tree planting, upland peat and bioenergy crops. Tom Andrew can through the numbers that we have.

Tom Andrew: We welcome the money that has been announced on peatlands and the long-term framing of that. As a minimum, Scotland needs to restore about 18,000 hectares of peatland a year. If the funding can deliver that restoration, that is excellent; if it can deliver even more, that is even better. To an extent, the more peat that is restored, the better, so it is very scalable in that sense. That restoration also has large co-benefits for things such as water quality.

As Finlay Carson said, we have a modelled set of scenarios that look at Scotland planting between 15,000 and 24,000 hectares of new trees every year between now and 2045. I think that the figure of 12,000 that Mr Carson mentioned is for the next calendar year. In our scenarios, we have allowed for a steady ramp up to that level, because we know that the market for afforestation will not just happen overnight. The 12,000 figure is a good first step on the way to increased afforestation. The 15,000 hectares should be considered to be the bare minimum. Again, it is scalable in the sense that, the more we do, the more carbon is sequestered now and in every year between now and 2045.

As Chris Stark said, the £40 million being diverted towards decarbonising agriculture is welcome. We have estimated the cost of delivering land transformation at the UK level at around £1.4 billion a year. The figure that you talked about for peatland, trees and agriculture looks like being £100 million or £200 million a year. If we consider orders of magnitude, that will not be enough in the long term.

Mark Ruskell: I want to go back to consider the decarbonisation of buildings and heat. I am concerned about that. I got a letter a few days ago from the Energy Savings Trust encouraging me to connect to the gas grid. That was ironic, as I already have a renewable biomass system using locally-supplied wood, but it poses a question, which is, where are we going with heat, and are we going there quickly enough?

You said earlier that there are two options. One is to have green or blue hydrogen in the gas grid. The other option is further electrification with air to water source heat pumps and other similar technology. We need a huge amount of work on skills to get us to that point. Are we almost beyond the point of no return on making a decision that will have an impact within the next nine years?

Professor Bell: We must make it easy for people to make a low carbon heating decision when their heating systems reach the end of their life and need to be replaced. We must build up skills and access to information now. There may not be a massive skills base, but people should know where to look and who to talk to.

There is an irony that some of the advice might be based simply on the lowest current cost. A gas-based system would appear better now. We have to tackle those questions. It goes back to the idea of a just transition. There are questions of fuel poverty and of what is affordable.

The regulator for the gas and electricity markets, Ofgem, is concerned about short-term affordability. That must be shifted towards a consideration of affordability in the medium to long term, and of where the balance of costs falls. How are different elements of the infrastructure paid for? We must make it easy for people to make low carbon choices.

Mark Ruskell: A lot has to happen if we are to crack hydrogen off methane and capture the carbon.

Professor Bell: Absolutely.

Mark Ruskell: A huge amount has to happen with the North Sea oil and gas sector and in other industries that use the by-products, such as Mossmorran. There is the potential for carbon capture and storage there but, when I visited the plant a few weeks ago, I found that there are no

plans whatsoever for any form of carbon capture technology that could be retro-fitted to what is Scotland's second-biggest polluter. Are we anywhere near being able to implement that huge system change?

Chris Stark: You asked earlier if it is too late. Absolutely not. We need to pull this off in the next 25 to 30 years. That means that we must take decisions in the next five to 10 years about how best to get there. I will make my point again: the biggest single challenge facing Scotland and the UK is what to do about heat, and the time when we could put off that decision has ended.

We must see solid plans for how to get from here to there. They do not need to be implemented today. Some of it will be difficult and will involve big decisions about infrastructure and how that is paid for. We do not have that clarity yet. We could start on heat transition quickly. The Scottish Government has some good plans in place to do that, but that is at the margins. The big question is what we do with properties that are on the gas network. There are big decisions to make about the right choices for those properties. There is still some uncertainty about the right path. I accept that. However, unless we take active steps to resolve that uncertainty, I will worry that we are not on a credible path.

Professor Bell: A lot of the active steps are about ensuring that the options are still available. We have the option of carbon capture and storage, but that means making sure that we are confident of the technology, and that the facilities are investable. We must do the work now to establish that and to make sure that there is a market for hydrogen. We are starting to see that now.

That idea is analogous to the renewables obligation for electricity a few years ago. A certain percentage of supply through the existing gas network would come from hydrogen, which in turn would be under an obligation to come from at least a blue source. The critical path for that is now dependent on the safety and billing standards and how quickly we could resolve the issues around that and get the standards in place, so that a policy could be put in place to develop a market, and so on.

Those steps keep the options alive and start to resolve the uncertainties that Chris Stark spoke about.

Tom Andrew: In the heating world, we talk a lot about low-regrets options. In Mark Ruskell's example about a home that is off the gas grid, I assume that the Energy Saving Trust thought that it had an oil boiler. Moving from an oil boiler to connect to the gas grid to potentially having to disconnect from the gas grid in 20 years' time would not be considered a low-regrets option. There is already a technology solution for such a property—a heat pump. That would save the user of an oil boiler money now and for the next 30 years. You are right to query that example.

Chris Stark: My rule of thumb is that the uncertainties need to be resolved and clear plans made in the next 10 years and that, from 2030 on, we need to be at full-tilt deployment. The challenge is huge. The UK has almost 30 million buildings, and the vast majority use fossil fuels. We have time to make the plans and resolve the uncertainties, but there comes a point when the Government—it has to be the Government—will have to set out its vision for how decarbonisation will be achieved and the policies that will drive the necessary infrastructure change. That is partly why I make the point, whenever I am asked, that that is the hardest of the challenges that lie before us. It is not like the electric vehicle transition—we will not get to the point where straightforward economics will make us want to purchase an electric car rather than a petrol car—because we need a well-unified and integrated approach from industry, the consumer and Government.

Claudia Beamish: I will move seamlessly into more detail about industry—I know that time is short and that other members have questions, too. The circular economy bill, which is coming up imminently in the Scottish Parliament, has all sorts of opportunities in it for remanufacturing and other areas. Is the CCC examining that bill? Do you have any other brief comments about industry, other than what you have stressed about opportunities and signalling to finance?

Chris Stark: I am extremely interested in the circular economy. The CCC struggles with it a bit, because we are driven by carbon targets. We should be better at it, and the same is true about waste, which is a sector that falls between the cracks a little. The strategy on waste is clearer, but you could legitimately accuse us of being overly blunt in the way in which we view the waste challenge. There is a lot more happening than simply removing waste from landfill, and the circular economy is probably the way into that issue. It is another area in which I would like to be better at offering more complicated and adult advice. We have not been able to do as much of that as I would like, but it is something that will follow.

On industry more generally, that is probably the area about which we have developed our understanding of most in the past 18 months or so. That has been achieved by an overall change in the methodology that we use with regard to industrial emissions. We used to say that we could not include an industrial process in the models unless we could be absolutely clear that it could

be decarbonised. Now we say, "Well, if we know it could work elsewhere, why would it not work in industry?" That has opened up a host of opportunities to cut industrial emissions by doing things such as fuel switching—a term that we use a lot—which involves substituting a zero carbon fuel, such as hydrogen, for a fossil fuel.

We are increasingly seeing a world in which there are industrial clusters of activity. There need to be at least two or three of them, if not more, in Scotland. In those places, fuel switching would become easier, because there could be a ready supply of something like hydrogen if it is ready to go, and carbon capture and storage could be done—again, Mr Ruskell is correct that the infrastructure has to be in place and that will not happen by magic. I am speaking beyond anything that we have published so far, but I would like it if that were viewed as something that could be industry led.

11:00

Across the UK, there are five, six or possibly seven areas in which it is sensible to make one of those industrial clusters, and to continue to have industry, but industry that is decarbonised. It would be hugely problematic if Scotland was not one of the parts of the UK that had a significant bit of industry, because of the natural advantages that we have to develop it. Grangemouth is a good place to put a decarbonised industrial cluster. There could also be one in Aberdeen.

It is not typically done but, if we start with industry and work backwards, and we view it as an opportunity instead of a problem to be managed, we can build a much more positive story about the jobs that go with it. My experience is that politicians are much more drawn to things when they can be presented as opportunities. We have got to get over ourselves and stop thinking of industry as a problem and start viewing it as an opportunity for Scotland.

It is true that there are big and important fiscal powers that are reserved to the UK Government. However, there is huge opportunity for the Scottish Government to make good provision for industrial clusters that are decarbonised. The more it does that, the more it will look advantageous for the UK as a whole to have its industrial clusters in Scotland. Professor Bell, do you agree?

Professor Bell: Yes.

The Convener: We are running out of time. However, Finlay Carson is going to ask a quick question and then I am going to ask a final one. However, there are some things that we still want to ask you about, so we will write to you with those questions.

Finlay Carson: I am absolutely delighted because Chris Stark gave me an in when he mentioned decarbonised industry.

What are your thoughts on thinking outside of the box? Dumfries and Galloway has huge potential for wind power. I understand that it is predicted that, to get to net zero emissions, about 80 per cent of electricity production needs to come from solar power or wind power. However, to achieve that, we need to multiply by 10 our electrical storage potential—from 3 gigawatts to about 30.

We have fantastic potential for wind, and for hydro, too. What thoughts do you have on creating industrial clusters in areas where there is fantastic potential for hydro power, wind power and for battery storage of electricity?

Professor Bell: Those are all great things, and there is no question but that they would bring massive advantages. As you said, renewable energy generation capacity has to grow to meet the increasing demand for electricity, and the proportion of that that comes from low-carbon sources also has to grow.

Storage of different forms of energy will be important in managing that kind of electricity system, because of the variability of demand. Storage can take different forms—it is not only a matter of using batteries but, as the cost of batteries continues to come down, they will be enormously valuable to our efforts. Hot water tanks provide cheap heat storage in buildings, provided that you have the space for them. They can be an important buffer if a heat pump is being used.

If there are reservoirs and dams, hydro resources are extremely important and useful. I am not sure how much they would cost, or how much potential there is, and we do not know how much low-hanging fruit there is and how much of it we will need to climb up the tree to get to, but of course there are benefits.

There are questions about how those facilities are financed, especially the large-scale developments such as pumped hydroelectricity storage. They are capital intensive, but they bring benefits over the longer term in terms of the way that the system is managed. The facilities that we have now were developed in state-owned days, and they were financed by the taxpayer.

There are strong analogies with the way that interconnectors are developed, but storage means that energy can be moved through time rather than space, in the way that interconnectors move it. There are particular regulatory arrangements to help with the financing of interconnectors, which will be an important part of the mix. That is done with a cap and floor mechanism, so it limits the

risk to the investor because the risk is shared. There is potential for similar mechanisms to be used for the development of large-scale storage, such as pumped hydro.

The Convener: I will round things off. We have talked about responsibility being shared between the two Governments. The two Parliaments also share a responsibility to examine the strategies that each Government puts in place. I would like to hear your views on how we can improve that collaboration and how necessary it is. As Finlay Carson mentioned, in order for the UK to reach its targets, it is reliant on Scotland reaching its targets, and the same applies the other way round. The most important thing is that we get this done for society, so it is incumbent on the two Governments to work together and on the Parliaments to scrutinise the action that they take. How can that best be achieved? What would you say to both Governments and both Parliaments as we look upon the challenge that they have responsibility for?

Chris Stark: I am going to make a technical point. I think that both Governments are crap at this. We are going to have to be better at it all round. It should not be the case that only the Committee on Climate Change takes an integrated view of the challenges across the UK, yet that is the case. There is no basis for the Scottish Government to raise legitimate concerns with the UK Government about what is happening at the Westminster level and the things that matter for achievement of the Scottish targets, or vice versa.

This year, we will host the world's climate summit in Glasgow. I can tell you now that the climate does not give a monkey's about constitutional or institutional boundaries, so we have to be better at discussing the subject. We must have a place, whether it is a clearing house or something else, where there can be a real discussion about what needs to be done and the overall strategy. We do not have that at present. In constitutional terms, there are various mechanisms that allow the Scottish Government to have discussions with the Westminster Government, but they do not represent a place where we can discuss long-term strategies for decarbonising the economy. I am afraid that we do not have the strong links between departments in Whitehall and the Scottish Government that existed 10 years ago. They need to be reconstituted.

We can pull out some of the key sectoral challenges, and those are the areas where there need to be much stronger links between the Scottish Government and Whitehall. My experience has been that, on leaving the Scottish Government to go into the CCC, I immediately enjoyed a much better relationship with all the departments in Whitehall than I used to have when I was director of energy and climate change in the Scottish Government. It should not be like that. We are an independent body and not part of Government. The situation fundamentally needs attention, and we have to get past it, because it will shortly become a real barrier.

I would like the situation to improve. I am not blaming any one party, but there must be a place to have discussions about the governance issues. As you said, convener, there is a quid pro quo in that we need some elements of the Scottish strategy to deliver for the UK as a whole, and some elements of the UK strategy definitely need to be in place in order for to Scotland to meet its targets. At present, I do not see a place for a sensible discussion about any of that.

Standing back from that, I note that there is a set of governance challenges writ large for the whole of Government—we have talked about some of them in this evidence session—and every layer of Government has a role in the net zero transition. That includes Westminster and the Scottish Government, but it also includes local authorities and even layers below that, because there are hyper-local policies that really matter. However, the way that we co-ordinate all of that so that we can make good decisions is not really a topic that any bit of Government has applied itself to.

I am pleased to hear that the Institute for Government is looking at the governance of climate change in Westminster, and I hope that that will be a long-running programme. We in the Committee on Climate Change are keen to present some evidence on what works at the local level. We will try to do that in the sixth carbon budget advice in September, and the work will continue after that so that we can start to present some better guidance to every layer of Government about what works.

However, I make the point again that we need to extremely rapidly have a proper place where we can set aside the political disagreements—which are all valid—and get into the nitty-gritty of how we are actually going to deliver over the next three decades a strategy that gets the UK as a whole to net zero and gets Scotland to net zero by 2045. Time is running out for that.

The Convener: That is a good point for us to end on. Thank you for your time this morning.

11:09

Meeting suspended.

11:17

On resuming—

Scottish Water Investment Plan

The Convener: Item 3 is an evidence session on Scottish Water's investment plan. I welcome our witnesses, who are representatives of Scottish Water: Dame Susan Rice, chair; Douglas Millican, chief executive; and Professor Simon Parsons, director of strategic customer service planning—that is a bit of a mouthful, but I got there.

I will open up the discussion by asking about the timeline for delivery. How does the 25-year strategy fit in with Scottish Government budgeting, priority setting, price determinations and policy?

Douglas Millican (Scottish Water): I will place the issue in context. For a long time, we have operated in multiyear regulatory periods, with the Scottish Government initiating the process by asking the Water Industry Commission for Scotland to conduct a strategic review of charges. It did that a couple of years ago and produced some updated guidance last year. Although the ask is for investment plans and price setting for the next six years—from 2021 to 2027—behind that was a request for us to set that in a longer-term context. As an industry, we and the regulators looked at developing a long-term vision for the water sector. That vision, which was launched last October, sets the context for the strategic plan. Our strategic plan is rooted in achieving the long-term vision that ministers asked us to achieve.

For the nearer term, the Government set out in a consultation on its objectives and principles of charging for the next six years exactly the sort of financial framework that it would like us to apply. Our plan is absolutely rooted in the requests that Government has made of us, which in turn will be joined up with other aspects of wider Government planning.

The Convener: Claudia Beamish will ask about some of the goals in the plan.

Claudia Beamish: How has alignment to the sustainable development goals influenced the strategic plan, and how will that influence delivery?

Douglas Millican: The water industry vision that I referred to a moment ago is completely aligned to the sustainable development goals—most obviously to SDG 6, with regard to access to water and sanitation for all. When we did the mapping, we reckoned that, actually, we contribute directly or indirectly to 10 of the 17 SDGs, so the vision is absolutely aligned to that and, indeed, to the national performance framework.

Our strategic plan is aligned to ensuring that we are on the right path to achieving the water sector vision. Over the course of this year, we will produce a delivery plan that will set out our key actions and milestones in the next six to 10 years for the delivery of the first part of that strategic plan.

Claudia Beamish: I was also going to ask you about NPF 4. Have you had discussions with the Customer Forum for Water, which we heard from in our previous session on Scottish Water, about your plans in relation to NPF, which is an inclusive structure?

Douglas Millican: Over the past couple of years, we have had extensive discussions with the customer forum. Its role and the challenges that it has presented us with have been highly influential on the form and content of the strategic plan that we published at the beginning of February. Indeed, ahead of that, it agreed that the plan reflected fairly the priorities of customers and citizens across Scotland.

With regard to NPF 4 or, indeed, any other form of guidance or instruction that comes out in the years ahead, our plan will be flexible, so that we can accommodate whatever new expectations are placed on us.

When it comes to NPF 4 specifically, there is a lot in our plan about, for example, trying to encourage a blue-green infrastructure. We do a lot of work in partnership with authorities across Scotland in that regard, and we ensure that, when areas are prioritised for development, land is set aside to ensure that there is sustainable management of drainage. Over time, we will be encouraging the use of water-efficient systems in new houses and renovations and will be promoting other aspects of sustainable drainage. Indeed, our surface water policy is aligned with that, so that we can minimise the risk of flooding from sewers for customers and for the protection of the environment.

Claudia Beamish: Has the climate change plan, which we have had a particular interest in, informed your strategy? Will you be feeding into the updated plan that will be published in April?

Douglas Millican: At the heart of our strategic plan are the two critical dimensions around climate change: adaptation and mitigation. At a high level, we are closely aligned in that regard. Professor Parsons can pick up some of the particulars.

Professor Simon Parsons (Scottish Water): Within our strategic plan, we call out the need to adapt for climate change and to mitigate our impact on climate change. One of the three outcomes in our strategic plan concerns going beyond net zero by 2040, which is five years ahead of the Scottish Government's commitments.

Claudia Beamish: Could you give us a bit of detail about how your strategy is developing in that regard?

Professor Parsons: In our strategic plan, we state that, this year, we will draw on external expertise and expertise within Scottish Water to produce a route map to get to net zero by 2040. That concerns not only our operational activities, on which we have made year-on-year improvements, but our capital activities, which are directly associated with our investment programme. The route map will cover a whole range of different activities, including—for example—our use of renewable energy and the work that we will do on looking at alternative materials and alternative techniques in our capital programme. At a high level, for both our operational and our capital programme, our emissions today are around half a million tonnes a year, so there is significant work for us to do to reduce that.

Claudia Beamish: Will you be able to feed into the updated climate change plan?

Professor Parsons: Yes. The work that we are doing is aligned, and we will be able to enable activities around, for example, blue-green infrastructure and access to our land. There is probably a big theme for us in there around peatland restoration in particular, which has multiple benefits to us in relation to climate change and securing high-quality source water for our treatment works.

Mark Ruskell: The net zero target is the national goal for Scotland. Some sectors will struggle to meet that and will make a smaller contribution; other sectors will go way beyond that and be able to hit net zero earlier and perhaps even become carbon positive through the production of renewable energy or peatland restoration. Where do you sit? Your target is the national target of net zero, which is great. However, we look at your landholdings and at the catchments that drain into your water. I am not denying the fact that you have a lot of challenges in relation to electricity production, but you have a lot of assets as well. There is a sense that you are a highly innovative public company, which is great to see—it is great to see a utility in that space. However, if the economic regulator said that you can put more customer money into that, because climate change is an existential crisis for customers as well, how quickly could you go?

Douglas Millican: We are being hugely ambitious in that area. The mindset that we are trying to create among all our people and our delivery partners is thinking about what is the art of the possible on an end-to-end basis. I hope and believe that we can, ultimately, get into an overall positive position.

Some elements of our emissions will probably be very difficult to completely eliminate, but we will absolutely be able to make a positive contribution in other areas. However, it is complex, because it goes from where raw materials are extracted for the manufacture of steel or pipes, for example, right the way through to the processing of those raw materials into finished goods and their transportation, as well as what we use here in Scotland. We are trying to take a holistic and global perspective, which is about asking what the emissions footprint that is associated with any of our activities is, and doing all that we can on any individual element to get as close to zero as possible, as well as being positive in all the areas where we can be.

Mark Ruskell: So you could meet the target quicker than 2040.

Douglas Millican: I do not want to overcommit. We have made the commitment to Government that we will publish our route map by late summer. We are being highly ambitious, and the challenge that Mr Ruskell just gave me is the challenge that I am sharing with our people internally.

The Convener: There are other challenges, such as those around our exit from the European Union, that you will have factored into your strategic plan. Will you give us an overview of how you have factored those in? There are a lot of things that we do not know about environmental standards and payment regimes, for example. How did you manage to factor into your strategic plans the fact that we do not know what is happening and that there might be a changing landscape? That seems impossible.

Douglas Millican: At one level, it is impossible to do. However, the thrust of our strategic plan is to look at the four fundamental main challenges that are ahead for us. One of those is making sure that we keep delivering excellent services for our customers, particularly in the context of our having to adapt to the changing climate as well as replace our ageing infrastructure. Then there is our commitment to net zero. However, through it all, we have to make sure that we keep the support and trust of our customers, who will, over time, need to pay more for their services. That is at the heart of the challenge that we face.

11:30

Between now and 2040 or 2045, there are clearly lots of uncertainties—things will come along that we cannot envisage. In the same way, we do not know exactly what the post-Brexit implications will be. Therefore, our plan is there to guide us on a direction of travel, but we will need to have lots of flexibility to adapt to challenges or

to take advantage of opportunities that come along in the years ahead.

Specifically on EU environmental regulations and so on, we are assuming that, based on the statements that it has made, the Government is committed to preserving the current standards. Over time, as there are perhaps new insights or research into the environmental or drinking water dimensions, those standards may change and we will need to address whatever changes in standards come down the track.

Finlay Carson: I will ask about charging and investment. Last week, the Water Industry Commission for Scotland published its strategic review of charges. What is your initial reaction to that report?

Douglas Millican: The Water Industry Commission has taken a very courageous position. It has not done what utility regulators typically do, which is just to look at the needs for the next five-year period. It has said that it has a duty to look at the interests of both current and future customers and that, therefore, it is right to look at what the requirements will be over a 20 or 25-year horizon—for example, what the implications will be for the future scope for efficiency in Scottish Water, for investment demands and, ultimately, for customer charges.

It is not easy for an economic regulator to say that, looking at all the facts, the consequence for customers will be slight increases in prices. It is interesting that all the research that we did with customers in producing our plan told us that they want us to be honest about the financial consequences and they do not want us to put off price increases if those are necessary to replace our assets and protect the environment. Against that backdrop, what the Water Industry Commission has come out with will be challenging for us to deliver, but it is acting very much in the interests of future customers as well as today's customers.

Finlay Carson: Do you believe that your model of planning and investment will deliver on a preventative spend model that will give you long-term security to meet those outcomes?

Douglas Millican: It should. It is certainly an improvement on what we have had so far, which has worked well. We have set investment priorities for a five or six-year period, which has given us a lot of clarity in planning. The new model will enable us to take account of emerging priorities and continually to reprioritise, which is one of the most important things to focus on. We will not just be driven by five or six-year periods, which will be good and will enable more effective and efficient delivery.

Finlay Carson: The shared vision that was published in 2019 said:

> "Together we will support the health and wellbeing of the nation ... We will promote access to the natural environment and encourage communities to enjoy ... it."

Is there a shared commitment across other portfolios such as health, the environment, transport and energy, and do your budget allocation and spending plans reflect that?

Douglas Millican: I will answer with reference to the short term and the long term. In the short term, the Water Industry Commission has suggested that the theoretical range for price change would be between 1 and 2 per cent above inflation per year. However, to be prudent, that should probably be between 1.5 and 2 per cent. On top of that, the Government is increasing the amount of borrowing that will be made available in the next period to more than £1 billion. Taken together, that should enable about 10 per cent more investment to be made in the next period than we have delivered in the current one. That is absolutely in line with the sort of investment that it will be sensible for us to make in the next period.

However, when we look towards the middle of the century, there are lots of unknowns, as we say clearly in our strategic plan. We can get a pretty good handle on what it might cost to replace our ageing infrastructure, but I cannot say today that I know exactly what it will cost to adapt to the impacts of our changing climate. There will be impacts right across our systems and we can make an estimate, but it is clear that new factors will be revealed. Equally, we are on a journey to try to work out the cost of getting to net zero. There will be uncertainties there.

We have said that we are committed to engaging with you and our customers, as the costs of delivering the plan become clearer, so that you know what the long-term financial consequences are and so that they can be taken into account in future strategic reviews, such as the one that will happen ahead of 2027.

Finlay Carson: You have ambitious, significant plans to replace old infrastructure. Do you have any contingency budget that will support businesses and communities that will be adversely affected, even just in the short term, by the works that you will carry out? We have talked about this in previous sessions. I believe that Scottish Water has a duty of care: it should be a good community partner when it comes to upgrading infrastructure and the impact of that on communities. Have you factored in any sort of contingency budget to ensure that communities are not disadvantaged?

Douglas Millican: In our plan, we have made a significant commitment to try to empower customers and communities through everything

that we do. One aspect of that will be to involve communities ever more not just in how we deliver investment but in what investment is delivered and when it is delivered.

We recognise that often, when we do investment, it creates inconvenience, and we are committed to minimising any negative impact and, wherever possible, finding positive impacts for communities. If, when we are assessing a particular project, it comes out that the community has a definite ask—with modest financial consequences—that we should take account of, we will do that.

Finlay Carson: The Water Industry Commission suggested

"optimising management of the PFI contracts".

How might that work in practice?

Douglas Millican: We inherited nine private finance initiative projects when we were set up, covering 20 waste water treatment plants and a large sludge treatment centre. When one of those contracts came on to the market last year, we took advantage of that and we brought it back in-house. That is a good example of how we optimise things. If there are other situations where we have a willing seller, we might well take advantage of that and buy the contract back.

We might choose to extend the life of some contracts. A good example of that would be our contract for sludge treatment and disposal at Daldowie. That is due to expire in 2026 and we are actively exploring with the PFI company whether it would be in its interest and ours to extend it. We are considering whether that would be good to do commercially and whether we could choreograph it to expire when other PFI projects expire around 2030.

The Convener: Rachael Hamilton has some questions on flooding.

Rachael Hamilton: Can you set out how the strategic plan and the delivery plan, together with NPF4, will clarify responsibility for flood planning? What benefits will that bring?

Professor Parsons: At the moment, multiple organisations have roles in dealing with flooding. We deal with flooding from the sewerage network, and obviously the Scottish Environment Protection Agency, local authorities and the Scottish Government also have roles. The recent report of the Infrastructure Commission for Scotland called for a bit more clarity on the roles and responsibilities around flooding.

There are some really good examples of where things can work very well. We are in two drainage partnerships with local authorities, SEPA and the Scottish Government, of which one is in Glasgow and the other is here in Edinburgh and the Lothians. Those are really good examples of where we can get true alignment and organisations working closely together to deal with surface water and the multiple causes of flooding. There are examples of really good work that already happens.

The national planning framework calls for proactive management of surface water, and we will see lots of new developments. We are talking more and more about blue and green infrastructure and surface water management. We are seeing lots of very positive action, but there is more that we can do. We hope that the drainage partnerships that we run are good exemplars of how we can get alignment between us and other organisations to help to solve the problems of flooding for communities.

Rachael Hamilton: Do you have any examples of where you have made improvements to the sustainable drainage systems—SUDS—network? How do you view the current efficiency and efficacy of the SUDS network?

Professor Parsons: I will give an example that I mentioned the last time that we were here, which was a while ago: the smart canal system in Glasgow. It is a fantastic example of collaborative working between us, Scottish Canals, Glasgow City Council and other organisations in the metropolitan Glasgow strategic drainage partnership. The smart canal system is an example of clever management of the surface water that means that we can open up areas of north Glasgow for development. What we have put in place there is based on SUDS infrastructure. That is a good example of how collaborative working and a focus on surface water really manage the issue.

The implementation of SUDS has been around in Scotland for a number of years. There are historical issues with the maintenance and design of the SUD systems and we are in the process of vesting significant numbers of those systems. New developments and much clearer guidance and information on the design and maintenance of the systems will make them easier for us to vest and easier to operate and maintain.

There is a legacy of poor design and implementation of SUDS. We now have much clearer guidance, although I am sure that there is more that we can do in terms of clearer shared guidance across Scotland and the UK on the design of SUDS, which will be an important part of our future infrastructure.

Rachael Hamilton: I want to push you a bit on that. With climate change, the threat of flooding and more surface water is imminent. How are you mitigating against the impacts to the environment

and indeed the cost of surface water to businesses, for example?

Professor Parsons: Last year, we launched our surface water strategy, which calls for two things. First, it calls for no more surface water to go into our networks. That is about how we work with businesses—for example, new developments—to make sure that no new surface water enters our sewerage network, to avoid putting additional pressure on our existing assets. There is no doubt that the forecast for climate change, surface water and rainfall will put more and more pressure on our existing assets. We have two phases—one is to make sure that no more surface water goes in and the other is to find opportunities for taking what surface water is going into our networks out of them. Our focus is on no more going in and on getting what is in, out.

Rachael Hamilton: Are the mitigation practices that you use to control surface water in urban and rural areas the same or different?

Professor Parsons: There tend to be more pressures in urban environments where there is hard standing and the green spaces are being reduced. Anything green is pretty good at slowing down the amount of surface water that is going in.

The challenges tend to be in urban environments such as Glasgow, Edinburgh, Aberdeen and Dundee, where hard standing and roof area mean that much more surface water is captured and transferred quickly into the sewer network.

Rachael Hamilton: I will push you on my question regarding the financial pressure on businesses caused by extra surface water. What is in place to help businesses with those increasing costs, particularly in relation to climate change?

Douglas Millican: If you look at our cost base, you will see that over half of our costs are to do with waste water activities, relative to the water side, and the handling of surface water is a massive part of the waste water costs. The size of sewers that are constructed are designed to cope with all the surface water that goes in; foul sewage, in volumetric terms, is a much smaller part of that. Waste water treatment plants are designed to cope with volumes of water up to three times the amount of foul sewage. The transportation and treatment of surface water through the sewerage system is inherently expensive.

11:45

On the specific issue of businesses, the Government sets the charging policy framework, and the way that the policy works at the moment means that if a business does not discharge any surface water into the sewerage system, it does not pay any surface water charges. Clearly, however, if it does discharge surface water, it has to pay surface water charges. We are undertaking exploration with the Government on whether there should be changes to those charging arrangements that might incentivise the removal of surface water from the sewers. We will keep looking at that along with the Government, while recognising that, if it is successful, there is still a substantial cost burden associated with all the surface water infrastructure that needs to be borne by the rest of the customer base. We continue to explore that area, but there are not necessarily any easy answers.

Finlay Carson: There is certainly a grey area over grey water in towns. Do we need clearer lines of responsibility when it comes to surface water and sewerage water? As you know, we have had issues with flooding in towns and fingers being pointed at Scottish Water when it is the local authority's responsibility to look after surface water on roads or whatever. Do we need to see more clearly where responsibility for that falls? Will that become clearer as you upgrade the Scottish water and sewage works?

Douglas Millican: I am not sure that there is such a thing as a perfect framework. Different countries tackle the issue in different ways. The arrangements that we have in Scotland are that Scottish Water, local authorities, landowners and so on have distinct responsibilities. The heart of the approach that is enshrined in the relevant legislation is the whole notion of partnership working. Together with other public bodies, we have got a lot better at that and we need to get better at it in future.

We have done a lot of work in conjunction with local authorities to develop integrated catchment studies on, for example, understanding the flows of water that are unique to local authority or Scottish Water responsibility, and what flows are shared between the two. We also support local authorities in their duties around surface water management plans.

I suspect that the future challenges will be to get ever better at our joint working, and to make sure that, where local authorities have responsibilities, they can access the finance that they need to do upgrade work as well as us doing ours. Equally, when the answer is to do something together, we need to find ways of funding and delivering that work together.

We are in a better place than we were a few years ago, and I hope that, in a few years, we will be better still.

The Convener: We now move on to questions on natural infrastructure.

Mark Ruskell: You have already touched on the role of natural infrastructure, and you will be aware of the Infrastructure Commission for Scotland's report that says that natural infrastructure is not being embedded enough in strategies and investment programmes. Where does that sit within your priorities? Is it at the top of the hierarchy in terms of preventative spend and long-term investment, or does it go into the too-difficult-to-do box in some cases because it is about partnership working and working on a catchment-wide basis?

Professor Parsons: Nature-based solutions have been mentioned a couple of times. They play a huge role in how we produce high-quality drinking water and manage surface water in our daily activity across Scottish Water.

The first step that we will look for around water quality is making sure that we get the best quality of source water that we possibly can. That involves active catchment management, whether of our own catchments or in partnership with others. In our decision-making hierarchy, for example, making sure that we have the best quality source water and managing it are pretty much at the top. Controlling any pollutant at source is far better than having to invest in energy-intensive treatment.

Mark Ruskell: That is the case where the asset is Scottish Water's, such as Loch Katrine, for example.

Professor Parsons: Yes.

Mark Ruskell: What about areas where you do not have control of the surrounding land use?

Professor Parsons: In those areas we can work in partnership with landowners, such as Forestry and Land Scotland, and the people who own the peatland catchments around us, to ensure that there is active management in the area. There are ways in which we work with Forestry and Land Scotland to ensure that the forestry land around our catchment is actively managed and protecting the source water is a key part of any management in and around the catchment.

Mark Ruskell: Are there examples of where you are struggling to bring that partnership approach together, where something like a land use strategy at a regional level might be more effective? Is it all plain sailing? Do you approach landowners and they say, "Oh yes, that's great and it fits our objective, too"?

Professor Parsons: No, there are lots of differences. The vast majority of the time it works very well: catchment owners understand the impact that they have on waters and recognise the importance of that management. SEPA has a key role in that. Sometimes it is complicated. If we take the River Ugie up in the north-east, there are hundreds—or even thousands—of farms and catchment owners who have an impact on that source water. We are going out and being very proactive there in terms of what we can do to protect the source waters. That is a lot more complicated than it is in an area where we own the catchment or work very closely with other Government agencies in managing catchments.

There are some case studies of places where we are being really proactive. For example, at the moment we are working on the Isle of Lewis, where we have a small treatment works at North Lochs. The catchment for that is not owned by us, but we are working with Scottish Natural Heritage and the local catchment to improve it, from both a carbon capture and a water quality perspective. If that work is successful, it may be preventative spend that puts off investment in that treatment works for 10 or 15 years. There are more and more examples of that type of investment.

Mark Ruskell: Are the wider Government objectives for biodiversity directly factored in? Do you build those objectives into the outcomes in the investment strategy and where does that sit? Are there investments that you might make to deliver a climate change objective that would have an impact on biodiversity or is it all win-win?

Professor Parsons: Not quite. We take our biodiversity duties very seriously and we report on them in our sustainability report and show examples of our reporting. In our strategic plan we are setting out changes in our decision making for the future. We had tended to be focused on whole-life costs for investment, but we are now thinking more about the six capitals and the natural and social capital contributions that any investment will also make. That is a growing part of our investment strategy. Peatland and carbon sequestration is a good example of that.

As part of our work with the Customer Forum for Water we have agreed to audit our assets and estate to look at greater opportunities for us to support biodiversity gains. That might mean allowing access to our sites or pathways through them. That kind of natural and social capital will form a much greater part of our decision making.

That is an important part of what the Infrastructure Commission for Scotland has also called for, which is a need for wider ways of thinking about investment decisions. The commission calls that out as a need for better decisions that cover not just costs, but also natural and social capital.

Mark Ruskell: How does that relate to current EU regulations, which relate in part to biodiversity,

and in part to other indicators, such as the bacterial quality of bathing waters and so on. At the moment, the Government wishes to stay broadly aligned to European Union regulations, but is your thinking evolving on how you balance environmental interests in that context?

Professor Parsons: We focus strongly on meeting all our regulatory requirements and all the expectations that are on us, a lot of which are end-of-pipe regulations from an environmental point of view. However, there is much more in terms of our conversations with SEPA, for example, whose water sector plan highlights the wider benefits that can be made from investment in our operations. There are more and more opportunities in looking at the multiple benefits of investment, rather than it being all about end-of-pipe compliance.

Claudia Beamish: I have a fairly targeted supplementary question. Last year, the committee visited Inverness and saw some interesting work in which culverts were removed, leaving what I would describe as a burn, although it was artificial to some degree. Repairing and planting was done and biodiversity was improved, and there was the possibility of a day centre being involved to improve mental and physical wellbeing from being in such surroundings. We also briefly saw an example of controlled flooding in which water could flow into part of a football pitch, meaning that there would be far less flooding further downstream. Are you involved in projects—even those that are not on your land—that provide what I see as positive and semi-nature-based solutions?

Professor Parsons: Very much so.

Douglas Millican: We are involved, but we have to be careful with regard to our responsibilities. On the waste water side, our primary responsibility is sewage and keeping it in the sewer system. From an economic as well as an environmental angle, our big driver in the management of surface water is to ensure that we keep surface water out of and, crucially, sewage in the system. We want sewage to go safely from somebody depositing it in their house right the way to a treatment plant, and we want to ensure that it does not overflow on to a playing field or the like. Our biggest challenge is to reduce the extent of sewage surcharging from sewers, which is an increasing challenge with greater storm intensity.

Returning to the essence of your question, we want to work in whatever ways are appropriate, in partnership with others, to deliver better outcomes for communities. As we adapt the way in which we work at Scottish Water, part of our challenge is to get all the people in Scottish Water who are involved in such matters thinking sufficiently laterally when they are working on projects, so that they take account of all the opportunities that they can contribute to, as well as delivering our narrow objectives.

Claudia Beamish: Do you agree that the type of project that I described might be considered as preventative work for you, as it might be that, in dealing with sewage, you are challenged by surface water?

Douglas Millican: It would depend on the specifics, but that might well be the case. What is key in partnership working is that, just as we make asks of partners, they make asks of us, and it is about how we work together most effectively to deliver the best outcome.

Dame Susan Rice (Scottish Water): Wearing my hat as chair of the board, I note that the board has governance responsibility for the company delivering its strategy, and that the board is tuned into those matters and understands the strategy fully. We have a number of non-executive directors who come from a range of sectors and who have a lot of experience, which is often international. That means that the challenge that our executives receive at the board is strong and informed. I hope that my colleagues would say that they find that helpful. From that end, these are good discussions.

The Convener: I have some questions on the security and quality of supply. What challenges are there in ensuring that the quality of source water is to the same standard across Scotland?

12:00

Douglas Millican: There are significant challenges. At one level, we are fortunate and blessed with our lochs and reservoirs and the soft water that people really enjoy drinking. However, that water can be full of lots of naturally occurring materials that can create by-products when it comes into contact with things that we use in the treatment process. We need to do quite a lot in many catchments from a filtration and treatment angle to remove some of those naturally occurring elements in our source water to make sure that it is always safe to drink. That is the stable state, if you like.

Beyond that, we face some wider long-term challenges—for example, we face more intense storms, which cause greater run-off of material into receiving waters, particularly up in the north-east, where a lot of our water is extracted from rivers. You just need to look at a river to see how the condition of the water can change in a very short period. We need to make sure that our treatment plants are robust enough to cope with that variability.

Occasional hazards can emerge. A live hazard that we are dealing with well is in a catchment

where, yesterday, we discovered some oily substance in the loch that serves a treatment plant. We traced that back to a breakdown related to an oil tank serving somebody's Aga—it had overtopped into the septic tank, which had overflowed into the burn that runs into the loch. The good thing is that we have plenty of days' storage in that supply, so we have turned off the treatment plant. We have contained the issue and we are managing it very well.

That is good example of the sort of left-field hazard that we face all the time. We have an important job to do 24/7 to understand the static environment and all the dynamic changes that can happen.

The Convener: We have talked an awful lot about flooding and you have alluded to some of the issues that can affect the quality of the source water. We have not talked about drought. Not so long ago—it was a couple of years ago—we had that period over the summer that impacted those who rely on water for feeding their animals and so on. How have you factored that such historic events into your future planning to ensure that we have that water supply?

Douglas Millican: That is another element that we need to take into account in our adaptation strategy for climate change. How we deal with potentially more severe and more extended periods of drought, such as the one that we experienced in summer 2018, is built into our assessments of the water supply and demand balance. We look at the likely long-term demand in a particular area and the potential variability in supply—for example, if consecutive dry periods are expected. That will lead us to improve security of supply in particular areas.

There will always be elements where the best and most efficient way of doing things relates to our just responding when the event occurs. It is not all about hard engineering; lots of it is about having good response and recovery plans for when events occur. Nonetheless, because our systems face multiple hazards—whether drought, diesel contamination that might come in from left field or failure of our infrastructure because of a power outage or a major burst pipe—we determined that we needed to build much more resilience into our water supply systems over time.

Our aim—over a significant period—is for all large communities to be dual fed. That means that if something affects the water supply, which usually comes from one source, there will be an alternative supply that the water can come from. However, we have a long journey ahead. We reckon that by the time we have completed the current Ayrshire resilience scheme in two to three years' time, about a third of Scotland will be able to be dual supplied. There is a long way to go to ensure that all major communities are dual supplied, but we will address that in the delivery of our strategic plan.

The Convener: Another issue is capacity of supply, particularly for growing settlements. I see that expansion in Ellon in my area, and you will know about the issues there. Projections show that there will be more of a rise in populations towards the east of Scotland—people have obviously heard how great the east of Scotland is. That will have to be factored into your long-term plan, because quite a lot of the larger towns and cities in the east have only one reservoir. How will you factor that in?

Douglas Millican: We will take a multifaceted approach to addressing that pressure. First, we have to keep bearing down on leakage in our water networks. We are now well into the economic level of leakage, effectively, but we keep driving that down as we get ever more efficient at finding and fixing leaks. We have driven year-on-year reductions in leakage and we need to keep bearing down on that over the years to come.

Secondly, over time, we need to encourage our customers—the people of Scotland—to become ever more efficient in their use of water. Some of that will need to happen upstream, in terms of building standards and the refurbishment of existing properties, but over time we will try to engage folks in the benefits of water efficiency. We held events across Scotland last summer at which we spoke to about 20,000 people. We wondered beforehand how well people would respond to that, given the joke about it forever raining in Scotland, so why would we need to use water wisely? However, we were hugely impressed by how people responded. They remembered the summer of 2018, so they realised that, even when it is chucking it down—as it is in February 2020—we are under water stress at times and might be under more water stress in the future, so they need to play their part in addressing that. We have a big job to encourage that in the years ahead.

No doubt, there will be further discussions over time, particularly with SEPA, around making sure that there is fair use of water that balances the needs of agriculture, business and the public water supply system. We might need to augment supplies in some areas, for example by raising reservoir levels. A scheme that we are likely to launch shortly involves augmenting the water supply for the Inverness area and out along the A96 corridor to the east, because of all the growth there. The two lochs that sit above Loch Ness to the south, which supply Inverness, might not have enough water in a really dry year to cope with huge demand, so the scheme will abstract from Loch Ness to supplement our existing supply. That

is a good example of how we are thinking and planning ahead to ensure that we can support growth, even in the context of a more challenging climate.

The Convener: Thank you.

Finlay Carson: The water network will potentially face more stress and demand in the future. With a view to tackling climate change and ensuring more efficient use of resources, businesses and commercial properties are already metered. If your ambition is to make the public more aware of water wastage, can you see individual metering of water usage happening in the future?

Douglas Millican: That is, for a variety of reasons, very much a policy matter for the Scottish Government. The Government's current policy position is to support household charging being primarily linked to council tax bands. However, if a household wants a water meter, we will supply one—albeit for a charge.

We can never say never to anything that might need to change from the policy angle, particularly when we are looking decades ahead. However, based on current metering infrastructure and costs, providing meters would be an expensive addition to the infrastructure. The regulator in England—Ofwat—did some work a few years ago and reckoned that the cost of installing, maintaining and reading meters worked out at an average of an extra £50 a year for the average household bill. In addition to all the benefits that our charging system in Scotland gives from a social protection angle, it is inherently a lower-cost one for all customers.

Who knows what the future might bring and what technologies might be available? If it is proved that people understanding usage helps to drive down consumption, perhaps we will have meters. However, we are doing work at the moment with the Energy Saving Trust to look at the fact that about a quarter of the energy bill in a home is for heating water. We are trying to raise awareness of the link between the use of water and the use of energy and people's energy bills. If we compare the size of energy bills to that of water bills, we see that driving down energy consumption through smarter use of hot water creates far more savings for households than they will achieve through reducing their water charges, given the fixed-cost nature of our water supply system.

Rachael Hamilton: I go back to Mark Ruskell's point about land use strategy and linking that to water treatment plants. Has any assessment been done of whether planting trees, for example, mitigates acidification and therefore puts less pressure on water treatment plants?

Professor Parsons: There is a trend not just here but across northern Europe regarding de-acidification. Among the benefits of cleaning up the atmosphere are the changes in the pH of raw waters, with more organics coming in. That is a side impact of the investment in the clean-up that took place many years ago. There is not necessarily a link between forestry and acidification; the biggest change is an atmospheric one.

There have been challenges in the past year for our water treatment works and our source water because of wash-off from our catchments—that is, from particles being washed off into our reservoirs. Certain kinds of forestry practice can slow down that process. Good forestry management practices in and around our catchments therefore have benefits. There is not necessarily a direct link with forestry in that way, but we would welcome any good catchment management that is linked to managing the risks for our source waters.

The Convener: Thank you for giving us your time this morning. I think that we have exhausted our lines of questioning.

I neglected to say earlier that we have apologies from Stewart Stevenson and Angus MacDonald, so that is on the record now.

At its next meeting on 3 March, the committee will take evidence on draft regulations establishing a register of persons holding a controlled interest in land and draft regulations on the right to buy land to further sustainable development.

That concludes the committee's business in public and we now move into private session. I ask that the public gallery be cleared.

12:12

Meeting continued in private until 12:46.

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