OFFICIAL REPORT
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Environment, Climate Change and Land Reform Committee

Tuesday 14 May 2019

Session 5

The Scottish Parliament
Pàrlamaid na h-Alba

Tuesday 14 May 2019

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ENVIRONMENT, CLIMATE CHANGE AND LAND REFORM COMMITTEE
15th Meeting 2019, Session 5

CONVENER

*Gillian Martin (Aberdeenshire East) (SNP)

DEPUTY CONVENER

John Scott (Ayr) (Con)

COMMITTEE MEMBERS

*Claudia Beamish (South Scotland) (Lab)
*Finlay Carson (Galloway and West Dumfries) (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:

Professor Keith Bell (Committee on Climate Change)
Professor Piers Forster (Committee on Climate Change)
Maurice Golden (West Scotland) (Con) (Committee Substitute)
David Joffe (Committee on Climate Change)
Chris Stark (Committee on Climate Change)

CLERK TO THE COMMITTEE

Lynn Tullis

LOCATION

The David Livingstone Room (CR6)

Scottish Parliament

Environment, Climate Change and Land Reform Committee

Tuesday 14 May 2019

[The Convener opened the meeting at 09:35]

Climate Change (Emissions Reduction Targets) (Scotland) Bill: Stage 2

The Convener (Gillian Martin): Welcome to the Environment, Climate Change and Land Reform Committee's 15th meeting in 2019. I remind everyone to switch off their phones or put them on silent mode, as they might affect the broadcasting system.

Agenda item 1 is for the committee to take further evidence on the Climate Change (Emissions Reduction Targets) (Scotland) Bill at stage 2. This morning, I am delighted to welcome, from the United Kingdom Committee on Climate Change, Chris Stark, chief executive officer; Professor Keith Bell and Professor Piers Forster, committee members; and David Joffe, team leader for economy-wide analysis. I welcome you all. Thank you for coming to see us so quickly after your report, which we have all found interesting, was issued.

I will ask you some questions about how you compiled the report. You had just six months to research and compile the report. In that relatively short space of time, are you confident that you have considered all the available options that are open to the UK and devolved nations?

Chris Stark (Committee on Climate Change): I will start by acknowledging that, as four white men, we are horribly lacking in diversity. I am sorry about that, but it does not reflect the make-up of the committee.

We are confident that we have considered all the available options. It has taken six or seven months of intensive work to produce the recommendations in the report for the Scottish and UK Governments but, of course, there is a lot more behind it than that—if you like, we have been in training for a while, expecting this commission. We draw on a number of pieces of evidence in the report, not least the work of the Intergovernmental Panel on Climate Change last year and its landmark report, "Global Warming of 1.5°C". The basis of our report is the IPCC work, a set of in-depth reports that we produced last year on land use, biomass and hydrogen, which are three essential components of the deep emissions reduction that we have projected in this report, and the body of work that we have put together over the seven or eight months since we received the commission from ministers. When we boil all that up, it allows us to say something that we have not previously been able to say. We now have a set of scenarios that take us out to 2050 and which, for the first time, permit us to talk about the net zero goal. We did not previously have the evidence base to do that.

I am certain that the evidence will get better over the coming months and years, but I am confident about the set of recommendations that we provided to ministers in the report. I am sure that we will want to look further at some of the issues that underpin our recommendations but this is one of the best pieces of work that the committee has ever produced and I think that it will stand the test of time.

The Convener: You mentioned that, as you go into the future, you want to do more in-depth work on some of the pathways. What are your top three priorities for that?

Chris Stark: Necessarily, we have had to do something that, in the main, looks at the UK. I have appeared before this committee many times, so you know that I have a prejudice towards thinking that we should also look closely at the Scottish issues. We have done a good job of that in this report, but some of the pathways to reduce emissions in Scotland will be contingent on things that happen UK-wide. Over the next 12 months, we intend to look closely at some of those things.

There is a requirement in the UK Climate Change Act 2008 for us to give advice on the sixth UK carbon budget next year. A huge amount of work in this report allows us to give an accurate assessment of the sixth carbon budget and the pathways to achieve the long-term target UK-wide. That will also allow us to look in much more detail at the Scottish issues.

Briefly, the kind of things that we will want to consider are the plan for decarbonising heat across the UK and how we approach the challenge of carbon capture and storage in the UK, which is an important issue for Scotland. We also want to consider some of the big issues that there is uncertainty about at the moment, such as what the policy towards land use and agriculture is after we leave the EU, if that happens.

We have made educated guesses about some of those things and have made a good assessment of them, but we want to consider them in more detail over the next 12 months or so.

The Convener: You have hit on another area that I want to ask about, which is equity. Obviously, there are more challenging targets for

Scotland to deliver, but a lot of what can be done is dependent on what happens at a UK level. Is it equitable and realistic to put these challenging targets at the door of the Scottish Government when, as you say, the decarbonisation of the gas network and issues to do with carbon capture and storage involve responsibilities that lie at a UK level?

Chris Stark: I would extend what you say even further. We are talking about a global issue, not just one that is for the UK to deal with. In the end, the world will have to do something about all these issues. We are all going to have to get to net zero or the game's a bogey. We can be pretty clear about the fact that these things will have to be in place or the overall mission will be off track. On that basis, it is fair, at this stage in the passage of the bill, to advise Scottish ministers that they should set the 2045 net zero target now and be confident that there will be a UK framework in place to deliver these things. In fact, I would say that inserting the new target into the bill at this stage creates a strong lever that I hope the Scottish Government will use when the two Governments are co-operating with each other.

I think that it is equitable to set the policy, but it is important that other UK and Scottish policy steps up to the task in a way that has not yet been the case.

Professor Keith Bell (Committee on Climate Change): There is an interdependency between Scotland and the UK as a whole when it comes to reaching the targets that we recommend for Scotland and for the UK. With regard to the electricity decarbonisation that needs to be done, the UK has already benefited from what has been done in Scotland, such as the development of CCS resource, forestation and so on. It is a two-way interdependency. Therefore, as Chris Stark said, there is strong reason to believe that it is right that the recommendations be adopted.

Professor Piers Forster (Committee on Climate Change): If you look at our cost analysis, you can see that the cost falls disproportionately on Scotland. We estimate that about 15 per cent of the overall cost of the UK net zero target falls on this country. That is much higher than your share of population or gross domestic product. Within that, there is an opportunity to send the rest of the UK quite a big bill for your forestation and your CCS work.

Stewart Stevenson (Banffshire and Buchan Coast) (SNP): I want to pick up briefly on what Chris Stark said. I very much welcome the confidence that he has in his report—it would be rather depressing if he had said something different. You talked about further evidence emerging, and I want to ask about that. The implication is that the evidence will reinforce the report—that is what I get from what has been said today and from my independent reading. When do you think it would be appropriate to further revisit the targets for the UK and Scotland in the light of that evidence, so that we might be even more ambitious in future? There are some pressures to consider different targets right now, which I am resisting, because I want to support what the scientists are saying.

Chris Stark: That is an interesting question. The hallmark of the Scottish and UK frameworks, under the respective pieces of legislation, is that, when the evidence supports doing so, we revisit the targets. Of course, it is about 10 years since those frameworks were put in place, so this is the moment to do so.

09:45

In response to your question, I say that, first, it is difficult to be certain what will happen with evidence in the future. Therefore, we have been prudent and cautious in our approach to aspects such as cost reduction and, on that basis, I think that we can be confident that the costs are in the right ball park.

The second thing is that the position is not static. The application of policy has a direct impact, especially on cost. There is an excellent—I would say that, wouldn't I?—section in the report on what happens then, which is that we get a very happy feedback loop. When policy is framed in the right way and markets respond in the right way, there is a remarkable impact on cost. However, we have been prudent. We have not seen those cost falls in all areas—most notably not in nuclear, for example. It is appropriate for us to be prudent and transparent about the way in which we approach these things.

The question of when we might return to the target is difficult. A period of a decade has been useful in allowing us to establish what happens when we have a framework such as this and policy steps up to address the issue. We have had several changes of Government over that period, both in Scotland and at UK level. The key component of the success of this bill when it becomes an act is that it should ride out those kinds of political shifts. I feel that this is the appropriate time for us to revisit the target, but there may well be a time to look at it again in the future.

My last point is that we do not have that much more time to achieve such targets, so the luxury of looking at the issue and thinking that we have decades of time will soon evaporate. Setting such a target at this moment is a fundamental step. I do not expect that we will be revisiting it any time soon. One of the straplines that I was using with

the team when we were putting the report together is that I do not want to do it again. This is the moment for us to do as fundamental a piece of work as we can, so that Parliaments up and down the land can make the right decisions.

The Convener: What was the methodology? Targets are one thing, but pathways are quite another. What model did you use to come up with the pathways? Was it the TIMES model again, or was it something different?

Chris Stark: I will pass over to my colleague David Joffe in a second to say something about the modelling approach. We did not use TIMES. I can speak from the experience of using it in the Scottish Government, of course, but we have a different approach, although we have used TIMES in the past.

David Joffe (Committee on Climate Change): We did not use only one model to come up with our analysis; we used detailed sectoral analysis and constructed an economy-wide scenario based on modelling in the power, building, industry and transport sectors and so on, so that we could get the great detail that sectoral approaches provide. We then combined them in a way that made sense across the economy, based on insights from modelling with not the TIMES model but one that was similar, the energy system modelling environment—ESME—model, which we used last year for our hydrogen and biomass report. We think that we have the underpinnings and insights from that modelling, but we wanted the greatest level of detail possible, which meant doing sectoral analysis rather than using a big TIMES-type model.

Professor Bell: I have come relatively late to the process, but I am very pleased to be part of it. The priority is to identify that there are credible and affordable pathways—multiple possible pathways. That means that there are uncertainties about some of the further ambition options for getting right down to net zero. However, there are options and that was the most important thing to establish from the detailed modelling, rather than doing what the TIMES model tries to do, which is to find a single optimal pathway from the data that are fed into it.

Mark Ruskell (Mid Scotland and Fife) (Green): You mentioned interdependency between Scotland and the UK in terms of policy and the potential for one target to leverage another. What about the European Union? We see a drive there now, with the European Commission wanting to set an EU target of net zero by 2050. How important is that interrelationship in terms of research and innovation, for example in relation to an EU-wide electricity grid? Is there uncertainty about that?

Chris Stark: The short answer is that the EU is not as important as the UK, but it is very important. Some of the strategies to achieve deep emissions reduction in some sectors rely on there being a compatible EU approach. The best example that I can think of is heavy goods vehicles. It is very difficult to conceive of a situation in which the UK alone, and certainly Scotland alone, could have a strategy to get HGVs to zero carbon without there being an EU-wide approach to that. We emphasise the importance of hydrogen in the report. To achieve the outcomes that we are hoping for, we would need an EU-wide system of freight management that used hydrogen infrastructure. We look at alternative options in the report, too, but it is fundamentally an international question.

The other aspect is that, at the moment, as members of the EU, we can sit behind some of the big frameworks, for example the EU renewable energy and energy efficiency frameworks. We need to see what happens after we leave the EU, and see how those frameworks are replaced. In the main, we are well ahead of some of the targets in those frameworks, so we have not had the opportunity to understand what happens when they start to bite on domestic policy. It is more of a theoretical exercise to consider what might happen in future. Europe is, of course, very important.

There is an interesting and important relationship between setting a domestic target for emissions reduction here in Scotland, and the impact that that might have on the UK setting a similar target, and the knock-on impact on other countries around Europe. In the report, we make a lot of the fact that there is a huge and underappreciated leverage role for the UK and Scotland in setting a target such as this, which far outweighs the impact in raw emissions terms. A rich industrialised economy such as Scotland and the rest of the UK setting a target as ambitious as this gives a much stronger platform for the EU to set the target that has been proposed by the Commission. In general, if we approach it that way, we can feel much more confident about the world getting on a better pathway. The counterargument is that, if we do not do it, it will be very easy for other parties, especially the EU, not to do it as well. This is a critical moment to set such a target.

Professor Bell: The other thing to mention is innovation. Chris Stark has talked about the importance of the hydrogen sector. Electricity is not the whole story, but it remains very important. A fair amount of electrification of heat and transport is built into what we see as being the credible pathways. There is an interdependency with the rest of Europe, and that interconnection is

a way of balancing out the surpluses and deficits of renewable energy as they vary through time.

For imports of electrical energy to be genuinely low carbon, rather than a case of us offshoring the carbon problem, depends on the electricity sector in the rest of Europe decarbonising, particularly in Germany and Poland. Again, political leverage is important in helping to move that. The innovation aspect is extremely important—it is clear that there are innovation needs in all sorts of sectors. We have been careful not to make bold or excessive assumptions about what those sectors will deliver. We can never quite predict where the main outcomes will arrive, but I feel quite strongly about the importance of the capacity to do innovation. We pointed in the report to the need for investment in skills, not just in deployment but in innovation.

We could look to the offshore wind sector deal as being an example of that, but it should not be seen on its own. There has to be a wider framework for this. Whether the system works, as an engineering system across the multiple vectors—there are still challenges in the electricity system and how it is operated—depends on the involvement of people with deep knowledge in industry, academia and in consultancies and so on.

There is a set of centres for doctoral training that are really important UK-wide in delivering people with that level of skills, who know how to do research. In February, 75 CDTs were announced by the Engineering and Physical Sciences Research Council. It is disappointing that none of those CDTs is concerned with the energy system, the electricity system or energy storage. A serious trick has been missed there.

The Convener: We will meet a few representatives of various sectors that have been challenged in this area. When you took evidence, were there any particular sectors that were not behind the net zero ambition? Could you outline their reasons for that?

Chris Stark: David Joffe might have better knowledge of that. I am afraid that I have only a summary knowledge of the responses. Most people who responded were advocates for the more ambitious target. From memory, I think that a few were not, but I have to say that I cannot think of a single sectoral representative who argued against it.

However, there was lots of caution about setting a target that could not be met. That is the really important thing for me, and it is one of the messages of our report. This is about much more than a target. It is not credible to have a net zero target unless there is policy to match, and at the moment, we do not have that policy.

Professor Forster: Perhaps I could speak from my experience of the aviation and agricultural sectors. As Chris Stark said, they are cautious because they are the two industries that cannot decarbonise completely. However, they understand that they have to do more than they are doing. They are not completely against the target, but I am almost 100 per cent certain that they will come back to the Government and demand financial support of some kind so that they can get there.

David Joffe: The input that we got from stakeholders came in via the call for evidence and that sort of thing before we had done the analysis. We did not have the opportunity to show the analysis to stakeholders as we might have done if we had had more time. Inevitably, stakeholders will have seen the analysis for the first time on publication and we would expect them to react to it because it is important to their sector. We will see what their reactions are in the coming weeks and months.

Claudia Beamish (South Scotland) (Lab): I would like to look at the committee's evidence on the appropriate contribution from Scotland in relation to capability, equity and, of course, support for the global effort.

I will start by asking Chris Stark and any other witnesses who wish to answer whether, if they are adopted, the Scottish and UK targets will represent the most ambitious targets globally.

Chris Stark: We are clear in the report that our targets are the appropriate contribution to the Paris agreement, one of the stipulations of which is that the countries of the world must offer their highest possible ambition, and we go on to define that.

Since we published the report, the IPCC has often been cited and I regularly hear that, because it has recommended that the world should reach net zero by 2050, we have therefore made an unambitious set of recommendations. It is important to make the point that that IPCC recommendation was for carbon dioxide only. We have offered a recommendation for all greenhouse gases, which is well in advance of the global average that would be necessary for the Paris agreement temperature goals.

We will be straining every sinew in every sector if we approach our targets in the way that we have recommended in the report. We have looked at an earlier date for the UK, and it therefore follows that we have looked at an earlier date for Scotland. It is a judgment, and that is why we have the committee—to offer such a judgment.

Any date prior to 2050 for the UK and prior to 2045 for Scotland carries a huge risk of failure. We can go into more depth on some of the sectoral

strategies that would be necessary to get to the 2045 target in Scotland, but there are physical and other real barriers to achieving it. Those things will not be easily fixed, even over 25 years.

We have looked at a really ambitious overall strategy. We have departed in two ways from the cautious approach that the committee has typically taken during its 10 years of existence. One is that we are now suggesting to the UK and Scottish Governments that our GHG emissions reduction target should go beyond the global average per capita. We have never done that before. Secondly—this is true UK-wide, at least—we cannot get you to net zero; we can get you almost all the way. We are confident enough that a pot of speculative options will then be available to get to net zero, but again, that is a step in advance of where we have typically been as a cautious committee.

I am very happy to defend that and it is a measure of how hard it was for us to put together a set of strategies and scenarios for deep emissions reductions in every sector. The 2045 date is as early as we can confidently predict, given all the other factors that we are required to consider as a committee under the climate change legislation in Scotland.

10:00

Professor Forster: Some other countries are considering quite similar targets, but I think that we can say with confidence that the scale of the 2045 target that we have set for Scotland will be the most ambitious in the whole world if it is adopted, because it is for all greenhouse gases, as Chris Stark said, not just CO_2. International aviation and shipping are also considered as part of the target. The other thing is that we want to achieve it as much as possible without international offset of some kind. With those considerations, we think that it is probably the most ambitious target that we can set up.

Claudia Beamish: How were considerations of global equity factored into the net zero calculations? Was directly tackling consumption emissions considered as part of the equation? Consumption emissions were estimated to be around 70 per cent higher than territorial emissions in 2016. Of course, you will know that, but I wanted to put it on the record.

Chris Stark: We made a transparent and honest appraisal of the equity issues. It is worth saying that on some measures, which we set out clearly in the report, we would see the UK adopting a considerably harder target. I should say that those are UK-wide measures.

In summary, you are right to raise the issue of consumption emissions; it is something that we worry about a lot. The basis of the statutory framework in the UK is territorial emissions, but that did not stop us looking at the issue.

The problem with consumption emissions is that we cannot entirely control their reduction. The first thing to say is that the majority of consumption emissions are what is produced here. Secondly, we know—this is pure science; in fact, it is pure chemistry, never mind science—that if we are going to tackle global warming, we must, as a globe, get to net zero and therefore the consumption emissions line will eventually fall. Thirdly, in achieving a domestic net zero goal, whether that is in Scotland or UK-wide, we will reduce our demand for some of the things that push those consumption emissions as high as they are at the moment.

In summary, the fact that we consume more than other parts of the world is one of the strongest arguments for us to go beyond the global average on territorial emissions and set a net zero target overall.

We have given as thorough a description as possible of what can be done about the consumption emissions problem, including the potential to set new policies that actively tackle it; we explore the option of carbon border taxes in the report, for example. However, it is still appropriate to use territorial emissions as a basis for target setting, given that that is what policy can control directly.

David Joffe: I would add that calculating consumption emissions is complicated; there is a big time lag between the emissions occurring and having the data and there are different ways that you can do it, which will come out with different answers. It is a less transparent framework for measuring emissions. As well as the considerations that Chris Stark has set out, it becomes much more difficult and much less transparent if you do it that way.

Professor Bell: On the international process, as Chris Stark said, it is a global challenge. These things have to be accounted for somewhere, so if the globe is committed to whatever the Paris agreement said, the emissions have to be counted in the global ledger.

Professor Forster: Our report is the first to include accurately calculated consumption emissions. They were calculated by Dr Anne Owen from my department, who did a fantastic job.

In the policy that we advocate for the UK, about 60 per cent of the levers that we want to pull focus on demand or have at least some element of demand reduction, so we can be quite confident that consumption emissions will decline in time.

Claudia Beamish: Thank you. Will you clarify whether the target of net zero emissions by 2045 includes an overshoot scenario?

Chris Stark: I will ask David Joffe whether he wants to say more about this, but the answer is that it does not include that—or, at least, it includes minimal overshoot. We looked at a number of ways of achieving the target and concluded that, again, we should be cautious and prudent about that.

Is there anything that you want to add, David?

David Joffe: No.

Professor Forster: I would just note that, if we move to net zero greenhouse gas targets, we will be in a situation where the country's contribution to temperature change will decline over time, so we will begin to reduce our contribution to that.

Claudia Beamish: Thank you. Lastly, I ask whichever of you feels it is appropriate to respond to say for the record why the rebalancing

"of effort towards existing climate leaders and richer nations"

appeared to you to be

"more plausible"

than increasing the effort of middle income and developing countries.

Chris Stark: That is one of the most important aspects of the report. We were let loose to look at a set of global issues that we would not typically be able to look at, and there is a great deal of new work in the report that you will not find in any other reports.

One of the really good contributions that we are now making to the global discussion is that we are trying to model a different scenario that is much more in line with the goals of the Paris agreement, whereby the richer developed countries go first and take a lead because they can do that and they can afford it. There is great service in them doing so. In Scotland and the UK, we have been doing that very well for the past 10 years.

One of the best expressions of why it is important for us to do that regardless of the fact that we have a relatively small proportion of global emissions is that, with policy, we have been successfully bringing down the costs of some of the key technologies. That is a service that other countries will then benefit from. It is most obvious in Scotland when we look at the offshore wind story, but there are other technologies, too. By supporting and deploying those technologies and bringing the costs down, we will feel more and more confident about their costs coming beneath those of fossil fuels globally, so that those countries that are still developing may never need to use fossil fuels and build the infrastructure. That is essential for us to achieve the goals of the Paris agreement.

It is an important aspect of our report that we look at those global concerns and model something that is more credible overall. I hope that other countries around the world and, indeed, the United Nations will pay attention to that.

The Convener: Is there also economic opportunity in that, given that the pioneers of the technology will be able to export their expertise and that technology?

Chris Stark: Absolutely. Again, this is something that we can be confident will be addressed in other countries. My stock answer to some of the questions that have been asked so far has been that everyone must reach net zero. In the knowledge that that is the case, it is a sensible economic development strategy to develop some of the technologies to do it here in Scotland.

The record of the past decade and more shows that, having had the Climate Change (Scotland) Act 2009 and legislation at the UK level, we have not ruined the economy. Indeed, it is quite the opposite. We have become a strong example of what happens when policy is framed in the right way. The economy has grown while we have successfully cut emissions, and that is exactly what needs to happen in every developed country as a demonstration of how we can achieve reductions overall. I am confident that it can be done if other countries follow this kind of framework.

The Convener: Mark Ruskell has some follow-up questions on that theme.

Mark Ruskell: The big take-home message from the IPCC report was that we need to take action in the next 10 years and that early action is absolutely critical. What research and analysis have you done in relation to the 2030 target? There is much more about what we should do and put in place now.

Chris Stark: I will open up the discussion, but I will first make some introductory comments.

We have necessarily had to look at a UK-wide strategy for net zero emissions, and we have drawn conclusions about how that effort can be achieved in Scotland, Wales and Northern Ireland, but we have not been able to build a detailed pathway in Scotland yet. We acknowledged that in the report, and we intend to do something about it over the next 12 to 18 months or so. That has meant that we have been prudent again and cautious about how to assess the sensible and important need for interim targets under the new Climate Change (Emissions Reduction Targets) (Scotland) Bill. We have used the best evidence

that we have of what the pathway might look like in order to get to the 2045 date, and that has been a straight-line assessment.

I think that we will revisit the matter. I do not know whether that means that we will revisit the 2030 interim target, but I know that we will have better evidence on which to base our assessment when we do that. The key component of our ability to assess the interim targets, especially in 2030, will be the assessment that we make of the UK's sixth carbon budget overall and the pathways to—I hope—achieving a tougher target if Westminster follows Holyrood's example.

Mark Ruskell was absolutely right to refer to the importance of short-term action. The issue is global. In particular, long-lived gases, as they are emitted, add to the global stock of CO_2, which is, after all, what global warming is all about. The more we can cut that in the short term, the better the impact on global warming overall will be.

Members can be assured that the Committee on Climate Change's interest is in seeing as much action as possible as soon as possible to deliver those goals. We will want to look at that in more detail when we have the evidence to do so.

Professor Forster: As Chris Stark said, we have not gone into detail about what to do in the next 10-year timeframe, but some definite key issues come out of the report. We want to bring forward the date for switching to EVs, and we want the Government to ban the sale of new petrol and diesel cars from 2030. We want carbon capture and storage clusters to be developed—they have to be developed in the next five-year timeframe—and we have to change our afforestation target immediately. We must get planting trees, because they take time to grow and suck carbon from the atmosphere. We recommended that Scotland's current forest cover of around 20 per cent ought to be rapidly increased to 30 per cent.

David Joffe: I will add to what needs to be done. With only around 25 years to get to net zero emissions, some of the infrastructure that we will need will require early action. It is not only about CCS, although that is crucial. If we are going to use hydrogen, the infrastructure for hydrogen production and supply will be important for electricity grids. On the softer side, public engagement and skills will be important in ensuring that we are able to deliver those things over the next two decades.

Professor Bell: The infrastructure question is really challenging for policy making. A lot of transport and energy infrastructure was developed quite a while ago, under market or financing arrangements that were completely different from what we have now. What is the right framework within which to develop a hydrogen and carbon capture and storage infrastructure?

The approach in the electricity and gas sector will be sort of incremental, albeit that the increments will have to be big to accommodate repurposing of the gas grid and electrification of at least some part of heat and transport. However, in starting from scratch when we need something that is pretty big, we must decide quickly what the policy levers should be to enable that and how that will be financed and delivered.

10:15

Mark Ruskell: I appreciate that there are big questions and what your report describes as speculative ways of reducing emissions, but it seems odd that you have, in effect, drawn a straight line for the next 10 years. If we adopted your proposed target, that would require an increase in effort by 2030 of 4 percentage points—from 66 to 70 per cent. What would fill the gap? In areas that fall under your previous and current advice, could we ramp up the ambition and go a bit further than 70 per cent, so that there is not necessarily a straight line?

Chris Stark: Absolutely. We acknowledge in the report that it is perfectly possible to go faster on some things, which would make it easier to achieve the net zero target.

I will list the things that need to happen. We are talking about an utterly incredible increase—I will rephrase that; I mean an amazing increase—in electricity production from low-carbon means.

Mark Ruskell: Is that over the next 10 years?

Chris Stark: Yes. That needs to be ramped up. The policies are there to deliver it, but the appropriate ambition is also needed. The report reflects on the UK Government's strategy for producing 30GW of offshore wind energy by 2030. If that target were increased, and if we went faster on electrification from some key technologies, we might get ourselves on to a different trajectory, and we would reduce the risks of not achieving net zero emissions.

Mark Ruskell: So, progress would be steeper than the straight line.

Chris Stark: Yes. We do not yet have the data on which to base a more detailed pathway for Scotland; I am sorry about that, but it is best to acknowledge it. We must understand first what the UK-wide position looks like and then what share Scotland can take.

The electrification strategy is one thing that we could go faster on. We mentioned the EV switchover date. It is indefensible to have a UK-wide switchover date of 2040, which is

incompatible with the 80 per cent target, never mind a net zero target. A car that is bought in 2040 that uses fossil fuels will still be on the roads 15 years later. In one of the best bits of analysis in the report, we show that switching to EVs will be a boon to the economy and that bringing forward the switchover to the earliest possible date—preferably 2030—would also be a boon to the economy.

Mark Ruskell: What about agriculture and land use?

Chris Stark: It is obvious that we must start planting trees, which means changing our approach to agriculture. We have been cautious about what needs to be done, but we must free up agricultural land for natural stores of carbon, which takes time.

We have discussed carbon capture and storage and the related issue of using hydrogen. If that is to play a meaningful role, as we think it should, in the next 25 years, the sooner we start on that, the better. We need a genuinely integrated approach to hydrogen from the Scottish and UK Governments the like of which we have not had in the past 10 years.

If those things are put in place and if they happen sooner, we can be more confident about achieving the net zero target, and we might be able to look at the date again. However, the best assessment now of how quickly the target can be achieved is in the report. Once we understand the UK pathway better, we will look at the 2030 interim date.

Mark Ruskell: Perhaps you can understand our difficulty. The bill that is before us will have gone through stage 3 and will have passed into law by the end of this year. Will we have to wait another two years for you to have more certainty before we set a 2030 target? The IPCC said that we had 10 years at tops. We will now have eight years, so time is running out. We need to decide now what a realistic 2030 target would be.

Chris Stark: We have offered you the best assessment of what is achievable in Scotland. We could not offer the detailed pathway that might inform a different 2030 target, but that does not mean that we will not come back to the question. I am not asking the Parliament to wait; I am asking it to take the advice that we offer in the report, which is very ambitious.

We have referred to UK-wide frameworks, but we should not let the Scottish Government off the hook, because a set of things can be done in Scotland—most notably in relation to agriculture and to housing as part of the built environment. If those things are stacked up in the next 12 months, we can be more ambitious about the interim targets.

Going back to my earlier point, I think that what happens over the next 10 years matters immensely. It is, of course, something that the committee cares deeply about, so you can expect us to look into the matter.

David Joffe: I think that it is really important to distinguish between the actions that we can take over the next 10 years and what those will mean for emissions in 2030. We now have a clear idea of the set of actions that need to happen over the next 10 years, and we have set some of them out; however, what we do not have is an idea of what exactly those actions will mean for emissions in 2030, because we have not been able to do that analysis.

The priority now should be to put in place policies to reduce emissions instead of working out and targeting the exact numbers. We know that we need to get to net zero emissions by 2045 and that there is a set of things that we will need to do in order to get there, but precisely what the emissions reduction needs to be as we move towards 2030 is, we think, less important than putting in place the policies to ensure that we get all the way to net zero. That is why we have focused on the end point and the actions that are required to get there rather than on the percentage reduction. Nonetheless, in the future, we will try to produce something more accurate than that sort of straight-line analysis.

The Convener: We have a lot of ground to cover. I therefore apologise to colleagues who want to ask supplementary questions. I suggest that you wait and ask them when I call you to ask your main questions.

We move on to questions from Maurice Golden.

Maurice Golden (West Scotland) (Con): I wonder whether the panel will reflect on changes to the emissions inventory—specifically the global warming potential methodologies and the inclusion of peat.

Chris Stark: In a second, I will turn to David Joffe to tell you how we approached the issue. Our general approach was, again, to be cautious about such changes. We knew that they were coming and that some of the emissions inventory changes will have a greater impact on Scotland, proportionally, than on the whole of the UK. Some of the changes, such as the peatland revisions, are very big.

The advice that we have offered is based on what would have the maximum impact on the emissions inventory. In other words, we are being conservative in the right way in our assessment of the matter. The global warming potentials and the peatland revisions might turn out to be lower, which would make the targets easier to meet, and we have accommodated that in our assessment.

David Joffe: I echo Chris Stark's point, that we have tried to be conservative. We had the option of making recommendations on the basis of the existing inventory. However, if we had recommended a net zero target that was more ambitious than what we have ended up recommending and, in three years' time, when the inventory changed, we had to say, "Sorry, you can't meet the target any more," that would have been quite damaging to confidence in the legislation. We have therefore been very careful to be conservative, and we are confident that the target can be met with any known forthcoming changes to the inventory. Things might come down the line, in the 2020s or 2030s, that we have not anticipated, but, as far as the known changes are concerned, we are confident that the target can be met.

Professor Forster: Perhaps I can give the committee some idea of the significance of the changes. If you were to make them today, they could increase emissions by an order of magnitude of 15 per cent or so, which comes back to the point that was made about it being quite hard, depending on how the changes go, to set a precise 2030 target.

My advice in that respect is that you really have to be sure about the baseline with which you are comparing your target. For example, as far as peatland is concerned, you would need to be sure about the emissions that you would be comparing and what GWPs you could achieve for your particular target. You need some continuity there.

The changes will have a big effect today, but, after you begin to do lots of peatland restoration and reduce your agricultural emissions, you ought to find that they are not so significant by 2045. Changing the inventories today will have a big effect, but their effect will not be so big as you go further forward in time.

Stewart Stevenson: I was going to ask about peat later, but it has come up now. I presume that the baseline for peatland emissions is 1990 and that the change in methodology has incorporated what has happened between 1990 and the present, which we acknowledge is not very helpful.

My experience is that peatland restoration for environmental reasons—for diversity and so forth—seems to happen extremely rapidly. What does the graph look like, as we move forward, for peatland's impact through reducing methane emissions and absorbing greenhouse gases? It is all very well to talk about peatland restoration, but that is currently being done for environmental reasons as much as to address climate change.

Professor Forster: A simple thing that can be done is blocking up drainage so that there is no draining of peatland. Just that one simple action almost instantly reduces methane emissions from peat. However, the sequestration of carbon dioxide would take more time, because peatland takes thousands of years to regenerate.

Stewart Stevenson: So, let us be clear: peatland restoration reduces emissions. I have seen examples of how quickly blocking drainage works. However, given that it will take a lot longer for the peatland to start to absorb CO_2, is that land intervention the most effective way to ensure that CO_2 is absorbed, or is forestry much more effective and quicker? We could talk about other land interventions that might be more effective, but I do not want to open the discussion up too much at the moment. We have to prioritise what works best and fastest.

Professor Forster: Peat is still very effective for emissions reduction and sequestration, and, because we are not talking about very big areas of land in the UK and Scotland, policies can be concentrated on relatively tiny areas. In targeting afforestation, you would have to engage with many more landowners throughout the country—in towns, cities, parks and all the communities—which would be a much more difficult logistical challenge. That is why, if you delve into the detail of the land use report that we published in December, you will see that we think that peatland restoration is a really effective approach.

David Joffe: Although I completely understand where you are coming from in asking what the priority is—whether it is here or here—the magnitude of our challenge of getting to net zero emissions by 2045 means that we need to do both the afforestation and the peatland restoration—and, and, and.

Stewart Stevenson: Oh yes.

David Joffe: Nevertheless, I understand where you are coming from in asking about priorities.

Angus MacDonald (Falkirk East) (SNP): Staying with the previous discussion, I think it worth pointing out that I hail from the Isle of Lewis, where trees that were planted on peatland 40 years ago are no higher than the desk in front of me. There are challenges for the numbers there, too.

I want to look further at the challenges that we face in realising net zero emissions. The issue has been touched on in response to some of Mark Ruskell's questions, but with regard to our further ambitions on electricity generation, what challenges do we face in increasing renewable generation to four times today's levels?

Chris Stark: That is definitely a question for Keith Bell.

10:30

Professor Bell: One of the major challenges is getting the supply chain and the finance going. At the moment, contracts for difference, which help to manage the risk of the variability of the wholesale price, are being offered only for offshore generation, whether it be generation that is in the middle of the sea or which is island based. We will see what happens with the less developed technologies, but that is the case for the more mature technologies. As Mr MacDonald comes from the Isle of Lewis, island-based generation will be a big topic of interest for him.

The financing for onshore wind remains very important. In my view, there is a lot of uncertainty about whether merchant development of onshore wind will happen in the short or medium term. Some seem to be reasonably confident about that and are developing the power purchase agreements to underpin those investments, while others to whom I have talked say, "No—that's just not going to happen." In the report, we say that some sort of financing mechanism is necessary for onshore wind, and that we need further development of solar photovoltaic energy.

There is also a network investment question, which relates not just to the need to accommodate new developments in generation where they are but to the electrification of demand, which we have talked about. The electrification of heat and transport will grow the electricity demand, which is something that has not happened in this country for years. That, too, must be facilitated by network investment at the right time. In the report, we talk about the need for timely investment.

There is a regulatory role to be played here. At the transmission level, the network companies are putting together their investment plans for 2021 to 2026, and the amount of money that they are allowed by the regulator will be extremely important in how they get delivered. We would expect some of the growth in demand to come through in that period. The distribution plans, which are also for five years, will come the year after that. Up to now, the regulator has been very worried about stranded assets, overinvestment and the risk of things being put in that turn out not to be needed. This is a personal opinion, but given what we have said about the pathways to the electrification of heat and transport, I think that being overly concerned about stranded assets will not be helpful in managing the total cost of facilitating the electrification of heat and transport.

Angus MacDonald: Moving on, we know the Scottish Government's position on nuclear energy, but what role does new nuclear generation play in the CCC's scenarios? Were the current difficulties with the deployment of new nuclear facilities factored into planning?

Chris Stark: David Joffe might want to come in here, but the point is that we need an electricity system that works, and such a system must involve a mixture of things. Renewable electricity production has proved a very useful addition to the energy system overall here in Scotland and in the UK. However, as we explore in the report, there are limits to how far we can go with that unless it is paired up with other technologies. In fact, alongside the report, we have published a separate document on the question of intermittency, which is often a key challenge that is identified.

This is another area where we have been cautious. We have assumed that we will get 60 per cent penetration of renewables in the future, although it will be perfectly possible to go further than that. A mixture of things will need to go alongside that to provide the flexibility needed to manage renewables at that level of penetration. Those things will include either firm nuclear power or firm carbon capture and storage, but we have made no assessment of the choice between those two options because, ultimately, the market will deliver that outcome. Nuclear energy might well have a role to play, but it needs to do so at a price that the market can deliver.

The best way to summarise our position on such matters is that the CCC is agnostic about the technology, but not about the price at which it is developed. That will be the key challenge. If nuclear is to play a meaningful part in the mix by 2050, it will have to do so in competition with other technologies, and a good and cautious assessment has been made of how that could play out in the future.

David Joffe: It is important to recognise that, in our approach, we prioritised looking at how low emissions could go rather than the precise mix of technologies that will be required. Clearly, a mix of technologies different to what we have assumed could achieve a similar level of emissions could be achieved, and it might be more or slightly less expensive.

However, our primary focus was not on that issue but on how low emissions could go and on what timescale that would happen. More or less nuclear power could be used than we have assumed, and that might get you to the same level of emissions, as long as you use the right mix of technologies to achieve the emissions reduction.

Professor Bell: We need to get the right policies to enable us to have the right kind of capabilities. At the moment—and I am talking here about schedulable generation, or the stuff that can be planned days or weeks in advance—the market will, if left to its own devices, deliver unabated combined cycle gas turbines. That sort of thing will not be acceptable very soon, given the lifetime of

such plants, so what are the instruments for ensuring that we have the right kind of capability? Although we are agnostic about the technology that is used, we are aware that its service to the system needs to be enabled.

For example, although the capacity market contributes to meeting the costs of developing new generation and keeping existing generation open, it is pretty crude in what it commissions; it is just about finding the total for the system somewhere. Currently, the market does not think about its ability to flex and help manage intermittency through the use of mid-merit plants. What is more, because it does not think about exactly where it is on the system, issues such as the security of supply in Scotland become really important.

The Department for Business, Energy and Industrial Strategy is reviewing how the capacity market works. It is in abeyance at the moment, but we assume that it will come back at some point, and it is important that we think about the features of the market that will enable the right technical characteristics.

Angus MacDonald: On low-carbon heating—[*Interruption*.] I am sorry, Mr Stevenson—did you want to come in?

Stewart Stevenson: I did, convener, if that would be possible.

The Convener: Please be very brief, because I am conscious of time.

Stewart Stevenson: The network pricing strategy of the Office of Gas and Electricity Markets discriminates against generators that are too distant from consumption. Given that plants that generate renewables are rarely on the doorsteps of our major cities, is it not time to have a network pricing strategy that relates to the climate change efficiency of the generation process rather than one based on the distance between generation and consumption point?

Professor Bell: The CCC has not gone into that level of detail for its net zero report, but perhaps I can respond to the question, given that I happened to work on the issue a few years ago.

The interests of society are served by two things: first, affordable access to electrical energy; and secondly, the decarbonising of the electricity system, which contributes to the overall picture set out by the CCC. Because affordability relates strongly to the minimum total cost of the energy, the issue as far as cost is concerned is that the right technologies need to be developed in the right places.

Clearly, there will be trade-offs. Before building a wind farm, you will want to consider where you can get the most wind and therefore the most energy per unit of investment. However, there is also the cost to the network of accommodating the wind farm. It is important that investors are given signals to allow them to make rational choices, given all the variables. It is really hard to try to intervene by playing games with the detail of various industry mechanisms, other than by setting out, at the highest level, the needs of the system and the decarbonisation needed by society.

We need to develop both offshore and onshore wind. That will come at a cost, but, as Chris Stark has mentioned, such costs have gone down as a result of the support that we have given the industry over the past 10 years. The market will need to ensure that the investment is covered and that investors come forward with business plans that work, including the costs to the network of accommodating the plans. The network's pricing signals need to incentivise the minimum total cost. Those signals are important not just for the development of generation but in how we accommodate demand and the choices that energy users make. That will be really hard. Do we build an electricity network to accommodate his-and-hers Teslas that are fast charging simultaneously, or do we say, "Well, actually, you do not have to fast charge simultaneously. You can do it when you need to—when it's windy or sunny. You don't have to do it just any time"?

Stewart Stevenson: At the moment, we are, because of Ofgem policy, paying Drax to feed Manchester and penalising renewable energy in more distant areas.

Professor Bell: It is about signalling the cost to the network of developments in different places. Many people would argue about the accuracy of those signals. I still believe that, in terms of the overall affordability of energy, it is important to give signals about what the costs are to ensure that investors can make informed, rational choices.

Angus MacDonald: I am conscious of time, but I will try to cram in a couple of questions. Going back to the question of low-carbon heating, what are the challenges in increasing low-carbon heating from the 4.5 per cent level of today to 90 per cent by 2050? For example, are there opportunities to accelerate action to decarbonise the gas grid and to consider the balance of taxes across different heating fuels, to enable affordable low-carbon heating in homes and businesses across Scotland?

Chris Stark: If there is a test of whether we are serious, it is on heating. We have an extraordinarily useful energy system delivering heat to every home in Scotland and the UK at the moment and it works extremely well. Sadly, it is based on fossil fuels in the main. It is not going to be easy to change that, but it is necessary that we

do so. The targets that we already have require that, and a net zero target makes it even more obvious that it needs to be done.

We do not have a strategy across the UK that will deliver a decarbonised heat system. There are big choices to be made about how to do it. The key message from the CCC to Governments in Scotland and the UK is that you have no excuse but to make that plan now. It is essential that that happens. That does not mean that we need to see the exact detail of what the system looks like in 2050, but it does mean that there has to be a clear commitment now, especially from the UK Government, which holds most of the policy levers, to a fully decarbonised heat system by 2050 at the latest, and preferably before.

The key choice is what we do with the gas grid—we are a country that still uses gas, and it is a useful thing. We have a choice of using hydrogen as an alternative, although it is not a case of flicking a switch to achieve that outcome. In the report, we lean heavily on electricity as the basis for heat, using things like heat pumps. It is perfectly possible to have a mixture of outcomes, for example, hydrogen and heat pumps in combination, and there are other alternatives that could get us there. That is one of the key issues that I expect the CCC to consider in more detail over the coming years.

I want to see a UK-wide strategy for domestic heat. We said in the report that the strategy needs to be formed by 2020. The committee may know that there is already a plan for the UK departments—the Treasury and the Department for Business, Energy and Industrial Strategy—to put together a plan to consider what happens after we close the renewable heat incentive. That is not enough—the approach has to be comprehensive. One of its key components should be to address one of the things that Mr MacDonald raised in his question—the in-built penalty around the use of electricity in the system and the in-built incentive to use gas. That has been a sensible policy for a long time on the basis of fuel poverty. It is not a sensible policy for climate change.

I want the strategic question of how we address the imbalance to be one of the key components of the review that we have recommended that the Treasury undertakes. The policies are there to deliver a different outcome, but it must also consider the regressive impacts on vulnerable consumers. There is no easy answer—it is one of the major costs in achieving net zero—but it needs to be addressed.

Professor Forster: Scotland can set a good example to the rest of the UK. Compared to the rest of the UK, a lot of homes in Scotland are not on the gas grid. With those homes not on the gas grid, there is even more of a cost incentive to go over to electricity as fast as possible. They ought to be the first adopters of the new technology.

10:45

On Mr Ruskell's point about the next 10-year timeframe, I think that there will be an opportunity to really go after the parts of the country that are off the gas grid in those first 10 years.

Professor Bell: Another important area in which we have fallen behind is the gathering of evidence to inform the heat strategy, which will need to show flexibility. What exactly the right option will be depends on what the starting point is, as far as location and resources are concerned—for example, whether someone is on the gas grid, and the density of demand. Evidence on that is lacking. Only now are we starting trials to test out how people would respond—for example, how they would interact with hydrogen-based appliances or understand and use air-source or ground-source heat pumps, which would mean that their homes would be heated in a different way.

It is important to note that it is very often state money—for example, through UK research and investment or the Scottish Government—that ensures that the evidence that comes out of the trials is clear. There have been too many such trials. Not long ago, the UK Energy Research Centre published a report that looked into energy system demonstrators and trials that had been going on since 2008. The reporting of such projects has been poor, and some have not produced reports at all. The whole idea of them was that we would get evidence to inform policy by showing us what works and which challenges still need to be met. An element of innovation policy that has been very much lacking is ensuring that we capture the learning and disseminate it properly. As I have said, we are already behind on that, given the urgency, which Chris Stark described, of getting a heat strategy in place.

Angus MacDonald: Okay, thank you. We will all follow that and look for quick progress in the near future.

If we look at the example of off-grid energy—but perhaps do not confine ourselves to that—would you say that members of the public are ready for a net zero target? How can a positive public discourse be built, particularly with hard-to-reach individuals and communities?

Chris Stark: All the evidence suggests that at least the majority of the public want to see a net zero target. In the report, we explain that, in order to get to net zero, we need to do what we have not done for at least the past 10 to 15 years, which is to engage properly with our country's citizens on how we achieve that.

There is nothing to be afraid of in such a target, but it would mean shifts in behaviour and the societal choices that would help to underpin those. One of those is the question of heat, as we could all start heating our homes from sources such as heat pumps. Those work extremely well, but they require consumers to interact with their home energy systems in a different way. I would like us to begin to tackle that issue properly. We cannot keep doing what we have been doing over the past 10 years—decarbonising electricity production very successfully—and expect that to get us all the way. It happens to be the case that, last year, more than half of the electricity supply to UK homes was low carbon, but most people have not noticed that. It has been a remarkable policy success.

The stuff that will come next will involve different types of behaviour. Those will have to be explored properly, with real people, otherwise we will not succeed and, frankly, the whole thing will go off track if we do not manage it in the right way.

My final point is that I do not think that that means that we need to engage everyone in the task of climate change action, although I am sure that we will want to do so as we go along. If we are to use smarter home energy systems and charging systems for cars, for example, those do not necessarily have to be seen as climate change measures. In order to keep the overall mission on track, the approach should be about engaging people in what you have described as a positive discourse about new technologies and new uses of technologies that will come along. We need to get on and do that as soon as possible.

Professor Bell: People worry about whether they will be able to adapt their behaviour, and they tend to say, “Oh, we are going to have do things differently.” Actually, I tend to be a bit more optimistic about that. We might look at the example of how people are now using electric vehicles. There might not be many of them around yet, but the feedback about them is often very positive. People have got used to doing things in a different way, and they really like many of the features that have come through. Therefore, there is a lot to be hopeful about as far as public engagement is concerned, provided that we can keep that momentum going.

The Convener: We will move on to what we might call the other elephant in the room, which is land use. Before I bring in Finlay Carson, I ask committee members to look at the questions that they intend to ask and to check that they have not already been covered, as we are running out of time.

Finlay Carson (Galloway and West Dumfries) (Con): My question is on the thorny subject of agriculture, and I declare an interest as a member of the NFU Scotland and a former dairy and beef farmer. It is suggested that more ambitious uptake of existing measures is needed alongside improvements to livestock breeding and diets. How should the Government ensure that that more ambitious uptake is adopted?

Chris Stark: It starts with having an honest discussion about it, and I am afraid that we have not got to that yet. There seems to be more of an open discussion in Westminster about some of the issues than there is in Scotland at the moment. Perhaps that is not the case, but it certainly seems that way to me. In particular, there is Michael Gove’s interest in public money for public goods—the idea is that there is a set of services that the land delivers. Among those is food production, but there are also others including biodiversity and carbon sequestration.

The agricultural community understands climate change better than any other; it can see the change in growing seasons that is coming. I would love to see us engage properly with that community and not regard it as the enemy, which is how the discussions are sometimes pitched. There are real emissions from agriculture, some of which are perfectly manageable, and if that community is engaged properly it can be a real part of the solution to getting us to the deep emissions reductions that are necessary for net zero.

The agricultural community should expect to be recompensed for that, but we will need to broaden the set of incentives that are provided for agriculture beyond food production to achieve that. In the report, drawing on the work that we did last year on land use, we advocate a set of measures that free up agricultural land to help in the process of storing carbon more actively, which includes forestry, peatland restoration and, possibly, bioenergy crops.

Finlay Carson: On that point, do you believe in a move to a multifunctional land-use scenario, whether that is voluntary or otherwise? Should we look at specific areas’ soil types, soil designations and land use and move to that sort of scenario?

Chris Stark: Yes.

Finlay Carson: That was a nice simple question. The next one might not be so straightforward. There is a suggestion that we should reduce meat consumption by 50 per cent. I suggest that, currently, that would decimate the agriculture industry, particularly in Scotland. Has any thought been given to the rate of culture or behaviour change that we could expect and the potential for displacement of meat production—the fact that more of the meat that is eaten in Scotland might be produced elsewhere in the world and have a bigger impact on the climate?

Chris Stark: To clarify the point, in our scenarios we model a societal shift in which we are consuming 20 per cent less red meat and dairy. In among a set of speculative options to get us all the way to net zero, UK-wide, we consider that one of the things that could be looked at is a bigger shift in diet. It is not something that we are advocating; we are saying that it is there as a potential option.

I believe that a 20 per cent cut in consumption of red meat and dairy is a relatively conservative assessment. If we look at the changes in diet between the younger and older generations, it is broadly in line with that. We looked at some of the public health guidance, which is nothing to do with climate change, and Public Health England has produced a really good assessment of how people's diet needs to shift if they wish to be healthier. The implication of that would be an 86 per cent cut in red meat and dairy, which was a bit racy for us, so we have gone with a 20 per cent cut. Rather than needing a policy for that, it looks very much as though it is broadly in line with social trends and, therefore, would not see us importing lots of meat.

I will make the key point again, which is that the cut would free up land to do a broader set of things and provide a different set of services. The agricultural community—the owners of that land—are in a profession like any other. As long as they are recompensed for doing those different things, I see no reason why we could not achieve something like that.

Professor Forster: I do not think that we will get to net zero without taking the agricultural community with us. It is important that we work together, and that whatever solution we provide works for them and for the country. We are talking about transferring about 20 per cent of pastures into things such as afforestation or bioenergy. We are talking about not bringing about a complete change to the way that agriculture is done, but re-incentivising it to take alternative approaches.

Finlay Carson: That takes me on to my next question, which is about agro-forestry, or forestry. What proportion of new woodland should be coniferous and what proportion should be broad leaf?

Chris Stark: I do not have the numbers in front of me, but we have not just assumed that we will grow conifers. Frankly, the cheapest overall strategy would be to build—no, not build; I am a city boy—to plant lots of conifers. We have been cautious and sensible about that because other things need to be considered alongside it, not least of which is biodiversity. I do not know whether any of the others have any statistics.

Professor Forster: Yes. You have raised an interesting point, because this is where we need the help of the research community. We know more about agro-forestry in tropical countries than we know about it in this country. A lot of the research in this country comes from the Forestry Commission, which has relatively big plantations. We do not have enough research about rewilding and what it does for the soil carbon and things like that. It depends on what you plant in particular locations. You talk about putting trees on the island of Lewis but a tree that you plant there might be different from one that you would plant somewhere else. It becomes a challenging problem for the research community, and we do not have all the answers.

Finlay Carson: Sticking with wood, why is there a presumption of only a 10 per cent increase in the use of wood in construction? What are the barriers to increasing that percentage?

Chris Stark: That seems to be low. We might have said that it should be more for Scotland but perhaps we can come back to that.

Last year, we did some deep research on biomass, and we looked at the question of wood in construction in deep engagement with the construction sector. The scenarios that we have in our report are cautious—a word that I am using a lot today—but many in the construction sector still find it difficult to conceive of them. We have not seen that there are major barriers to using wood in construction, even in high-rise buildings. It is a sensible use of a biomass resource.

I would love to see the kind of assessments that we are making outperformed. It seems to me to be a sensible use of Scottish biomass resource and we have a lot of capacity to grow it here.

Professor Bell: The further ambition assumes that 40 per cent of houses and flats will be built with a timber frame, which will be up from under 30 per cent today.

The Convener: We will move on to talk about obstacles and costs. We have picked up quite a lot of the other issues that we wanted to discuss along the way. Mark Ruskell will start us off.

Mark Ruskell: We live in a fossil fuel economy. The UK is a big oil and gas producer and fossil fuels are cheap. Can we continue to extract oil and gas at the current rate? Can we adopt a policy of maximum resource extraction and still meet a net zero target by 2045?

Chris Stark: This is one of the most difficult areas for us. The short answer is probably that we can, but we will need a set of things that are not yet in place to deliver it. The kind of extractive industries that we have at the moment are not

compatible with an overall net zero future for ever more.

As David Joffe said earlier, in the report, we have focused on the question of whether we can get to net zero, and we have clearly nailed it that the answer is yes. In the report, and again using cautious assessments, we use a lot of fossil CCS, but there are alternatives. At the moment, they look like more expensive alternatives, especially the greater and more extensive use of electricity.

My personal view is that I would love to see that improve. When we come to do the more detailed assessments in the next 12 months or so, we will look at some of the alternatives to that fossil CCS question. However, in the hydrogen-fuelled economy that we have talked about a few times during this discussion, it is likely that some of those alternatives will come from natural gas, for example. There are alternatives to that, but they are more expensive alternatives, although that does not mean that we should not pursue them.

So, there is a world where we continue to extract oil and gas, but it cannot be a world where we burn that oil and gas unabated. That is the key thing. It is another one of those areas where we have to be extremely clear. I would love to see a much clearer strategy from Government on what it intends to do about that overall.

Some of the things that are in the report do not sit well with some of the campaigns by non-governmental organisations. In future, I hope that we can look at more of the options around those.

11:00

Mark Ruskell: What is your view of countries such as New Zealand, which have said that they will draw a line and will not do any more licensing or issue more exploration licences? Even Norway recently said that it would not allow exploration in the Lofoten islands. Countries are considering the demand side, but they are also considering generation by and the extraction of fossil fuels and saying that we need to start transition now.

Professor Forster: I was an author of last year's IPCC report. At the time, we looked at a whole lot of pathways that could get us to 1.5°. As Chris Stark said, there is a clear option in those pathways: either you have the extraction industry continuing, accompanied by huge amounts of carbon capture and storage, or you rapidly phase out the extraction industry. We have a range of pathways that go between those extremes of either phasing out the extraction industry as fast as possible and replacing it with something else, or having to increase your CCS. There is not one perfect way.

Mark Ruskell: Where does your advice sit at the moment on that issue? Do you assume that we will continue with current levels of extraction, or do you assume a certain level of transition because, otherwise, we will be taking a big risk on CCS?

Chris Stark: That is not clear in the report, one way or the other. We have looked at a feasible strategy that could get us to net zero. As I mentioned, we have a lot of fossil CCS in there, which probably amounts to there being a similar size of industry, but a different approach could be taken. You mentioned New Zealand. A political choice has been made there, and it is one that gets us to the net zero target like any other. The Committee on Climate Change's job is to try to avoid the political choice and instead give you the assessment of the implications of such choices when they are taken. I think that the report is as good as any in that regard.

To give my personal view again, I would love us to go harder on some of the options that involve a much reduced use of fossil fuels. At the moment, those look like more expensive options. The Committee on Climate Change is required by the climate change legislation in Scotland and at the UK level to assess the cost-effective path as best we can.

The Convener: I have a question on the oil and gas industry. At current levels, if we moved to a model in which hydrogen was the main fuel for, say, heating and transport and we used the natural gas that is produced in the North Sea and west of Shetland as the feedstock for that, while the oil was used as a feedstock for manufacturing, would that in effect mean that we would be able to manufacture more here, thus reducing the need to import as many goods, which could have a knock-on effect for us in reaching net zero? With all those options, we would still have an oil and gas industry. If we were to shut down that industry tomorrow, that could mean that we would not have a feedstock for hydrogen and that we would have to import a lot of feedstock for the manufacturing and chemicals industry. Do you see where I am going?

Chris Stark: Yes, that is broadly right.

David Joffe: It is important to recognise that, if we do not produce the oil and gas here but still consume it, it will need to be produced somewhere else. The best thing that we can do for the climate is to reduce the amount of fossil fuel that we consume in areas where we can do so, although we will still need it in some areas. The question of the fossil fuel consumption that we end up with, whether it is produced in Scotland or elsewhere, is not a matter for the climate; it is a matter of how the economics play out.

The Convener: We are rapidly running out of time, but I have a question about the modelling that was carried out. Did you consider the projected co-benefits of carbon reduction, such as the long-term benefits in terms of air quality and the impact on health of active travel and healthier diets?

Chris Stark: We did. What we have not done in this report is wash all that together with the overall costs. We wanted to be completely transparent about the reality that there is a cost involved in achieving net zero. We assess that cost on a UK basis as being between 1 and 2 per cent of GDP. That is our best assessment of something that is extremely difficult to assess.

We also considered the co-benefits, not least those of improved health and air quality. If you take the Treasury's green book, which provides a basis on which investments can be appraised, and roll forward some of those benefits—it is worth saying that they are more difficult to assess and monetise—you get to the figure that we set out in the report of about 1.3 per cent of GDP coming from co-benefits around health and air quality. That is a clue that doing all of what we are talking about is much more than just an exercise in addressing climate change. There are real benefits in reducing emissions, particularly in relation to the air quality question, and there are wider benefits in relation to biodiversity overall.

Of course, the biggest benefit of all involves avoiding the huge impact of climate change in the future. That is why we have not tried to give a false prospectus. There are real costs that need to be managed, but I expect the benefits to be enormous, as well.

The Convener: So, basically, early action now is going to prevent the huge cost of climate change in the future.

Chris Stark: Yes.

Professor Forster: I should say that you have to get those early actions correct. That is why it is good that you have a just transition commission. You get the benefits only if you do things in the right way.

Claudia Beamish: I am pleased that you highlight the just transition commission in the context of the fossil fuel industry.

With regard to the extraction industries, what place is there for the circular economy and the remanufacturing of plastics as a consideration alongside carbon capture and storage?

Chris Stark: There is a place for them, but I do not have statistics that I can use to set it out. In the summary of our report, we reflect on the importance of using and reusing the goods that we purchase, and of buying high-quality goods in the first place.

The circular economy involves a wider set of things than just climate change. In our report, we consider the question of waste and the emissions from waste. That is one of the key areas in which the circular economy might result in emissions reductions.

It is hard for us to assess the impact of the circular economy in terms of the overall emissions reduction that we have proposed. However, my point is that we need to throw everything at the net zero challenge, and that includes having a much more circular economy. David Joffe might be able to say more about how we have approached that challenge.

David Joffe: I would add only that, for the first time, our analysis has involved consideration of the potential for resource efficiency and what that can do in terms of reductions in emissions from industry. We have taken our analysis forward in that regard. We have a new evidence base and we have been relatively ambitious, although I am sure that there is more that we can do. However, we have considered the area. In particular, we want to think about the bits of the economy that will be hard to fully decarbonise even by 2045 or 2050, and what we can do on the demand side in that regard. That is an important area for further work.

Mark Ruskell: I want to ask about infrastructure projects. In recent Scottish budgets, we have seen the Government grading its infrastructure investment in terms of investment in high, medium and low-carbon infrastructure. Should we be aiming for a particular target? Obviously, there is a danger that, if we build high-carbon infrastructure, we are locking in emissions by design not only for 10 years but for 20, 30, 40 or 50 years.

Chris Stark: I do not have a strong view on how we approach the infrastructure questions, other than that I believe that we should approach them properly. It is perfectly possible to get to net zero with the kind of costs that we have assessed—indeed, I would say that those costs are relatively small and very manageable—but the costs will be much higher if we do not think about the turnover of capital stock that is necessary to deliver net zero. That involves transport and energy in particular, but also housing stock.

If, at the end of this period, we scrap capital assets, with the costs that we would incur to do that in a market like the one that we have, that is going to be much more expensive than it needs to be. I would like to see decisions about infrastructure provision, here in Scotland and across the UK, made in light of the net zero target. It is interesting that the UK-wide National

Infrastructure Commission said something similar yesterday, I think—it was certainly this week—which was that the Government needs to think in those kind of timescales to deliver the right outcome.

We have a whole section in the report on the infrastructure requirements of net zero. Active thought and planning are needed, or we will not get there at anywhere near the right cost.

Mark Ruskell: What does that mean in practice? Does it mean fewer road-building projects, for example?

Chris Stark: Road building is one of those areas where it is not possible for us to be completely definitive, because if we are all driving electric vehicles, roads will become a much lower-carbon infrastructure asset. I am thinking less about road building and more about the energy questions. We forecast a doubling of electricity demand, which has a big infrastructure requirement.

The biggest infrastructure requirement of all—the hardest one—is housing stock. In Scotland, there is a much better plan for that than there is UK-wide, with the idea of achieving something over 10 or 20 years. It is far more sensible when there is a clear goal in mind and a clear set of policies to deliver it. I would love to see the rest of the UK adopt that approach.

Professor Bell: The timing issue that Chris Stark mentioned is really important. As the capital stock gets replaced—if we know what its lifetime is and whether it is going to be there for 25 years or whatever—it is important to ensure that low-carbon considerations are built in at the beginning. Early asset write-off will not be helpful.

Finlay Carson: I have a very quick question about obstacles and costs. How reliant are your ambitions for 2045 on behavioural change and taking the public with us? What risks are involved in that? On a scale of one to 10, how important is behavioural change?

Chris Stark: I can do better than that. If you bear with me, I will tell you exactly what role behaviour change plays in our assessment, because I have a handy pie chart that I will now bring up on my iPad. We are relying on a mixture of technological change and behaviour change to achieve net zero. I suppose that the key message is that we will not achieve that unless we engage people properly in that challenge. Thirty-eight per cent will be achieved through low-carbon technologies, 9 per cent is largely societal and behaviour change, and the rest is a combination of those two things. It is clearly an art rather than a science, but that gives you a sense of the proportions.

The Convener: I come back to the cost benefit of doing all that work over the next couple of decades. Should the Treasury review be looking at that now?

Chris Stark: Absolutely. We very carefully recommended to the Treasury that it should review it. I do not know whether it will accept that recommendation, but I hope that it does.

I do not think that we will make much further progress if the answer to decarbonising the whole economy is simply to lump more costs on to the electricity bill. There is a real need to look at the issue properly. The key outcome at the end of this is that we need something that delivers net zero in a way that is not regressive—that is, that it does not have a damaging impact on, in particular, vulnerable citizens. It should also not impact regressively on competitiveness—I do not think that that has had nearly enough attention in policy terms.

There are real reasons for the Treasury to look at the issue. The environmental taxes that have delivered very high revenues for a while—fuel duty for example—will not be there in future, as we switch to electric vehicles, so the Treasury will have to think about that, if only in relation to the revenue issues. I would love to see the Treasury approach that work strategically, as it once did with the Nick Stern review. The Treasury commissioned the Stern review, which still provides the basis and economics for a lot of the work that we do, 12 years ago. At that point, the Treasury viewed the review as a big strategic and economics challenge, and I think that now is the moment for the Treasury to re-engage with the issue on that basis. I am optimistic that, if Treasury does so, the whole thing can be managed in a way that is not regressive and does not impact on competitiveness. However, that requires proper thought.

The Convener: It will take political will to look beyond the election cycle.

Chris Stark: Absolutely. In the past, the Treasury has been good at doing that. It generally takes the long view on the UK economy. If we do not take a long view, the transition will not be successful. Piers Forster made a point about the importance of the just transition. The second part of our recommendation to the Treasury was that we should think about not only the fiscal issues and the big, strategic issues but, alongside them, the regional impacts and the impacts on vulnerable communities.

11:15

Mark Ruskell: At this point, we are not fully into stage 2, so it is early days, but do you have any

reflections on the early response from the Scottish Government to your report?

Chris Stark: I am delighted that our recommendation was accepted so early. I think that it was at two minutes past midnight; I will allow them 60 seconds. That was wonderful. Given the stage that the bill is at, in many senses the Government had to respond quickly. However, it matters immensely that it chose to accept the recommendation as quickly as it did, because that gives the rest of the UK a much better lead to follow. It is now much clearer that we need to stop talking about targets and start talking about delivery. To my mind, that is fantastic for Scotland.

Professor Bell: That sends a fantastic signal. It highlights some of the things that we have already talked about this morning—the action that is needed and the interdependency with other actions. We must consider the fact that meeting the proposed and recommended target for Scotland depends on UK-wide action. It also goes the other way—meeting UK-wide targets depends on action in Scotland. We have to get on with it.

How do we prioritise action in the short term? Mark Ruskell has asked fair questions about that and, as we have said, the report will aim to answer them. However, some of the actions will be the political choices that we have talked about.

Mark Ruskell: Ahead of stage 2, what can you do to inform that critical 2030 target? Is there more work that you can supply to the committee?

Chris Stark: No, I do not think that there is.

Mark Ruskell: So, at the end of the day, is it a political choice?

Chris Stark: There is always a political choice to be made about the level at which to set the target, but we do not yet have a basis on which to offer a more comprehensive assessment of that target. I am sorry, but that relies on a set of things for which we do not yet have evidence.

Professor Forster: We pushed everything as far as it could go, so it is not worth going back to do revised modelling. We did that throughout the six months. Time and again, we went back over the figures, but things changed by only 1 or 2 per cent, because we were asking the calculations to do everything. The results do not change hugely.

Mark Ruskell: What chance would meeting the 2045 target that the Government has adopted give us of keeping the world below warming of 1.5°?

Professor Forster: It gives us a really good chance of doing that, because things are now poised internationally. Scotland, as a well-developed economy, is the first such country to set such a strong target. Things are carefully poised in EU countries, so the EU adopting a net zero 2050 target now becomes more credible. When the EU adopts a target, other countries will fall into line. If the UK wants to hold the next conference of the parties—COP—meeting in 2020, what better place to do it than Edinburgh or Glasgow? The opportunity exists; it would be good to set a target for the rest of the world to follow.

Mark Ruskell: I read somewhere that the target gives us a 50 per cent chance of meeting 1.5°. Is that right?

Chris Stark: If the target is replicated across the world and coupled with ambitious near-term reductions, it will deliver a greater than 50 per cent chance of limiting temperature increases to 1.5°.

Mark Ruskell: That is still a big gamble.

Chris Stark: We do not have pathways that would deliver much more than that: we have drawn on the best evidence. We are not conceding and throwing in the towel. At the moment, that target is as good as we can give and is as ambitious as we feel we can be.

Mark Ruskell: There are big risks, however.

Chris Stark: Of course there are risks, and we expect that the committee will be all over that.

Professor Forster: The IPCC has said that we should prevent every bit of warming possible. In June, warming will begin to go up—indeed, it is going to do so from today—which is why it is important that we set the most ambitious targets.

The Convener: Before I bring in Claudia Beamish and Stewart Stevenson, I want to make an early bid for Aberdeen to host the COP.

Stewart Stevenson: I was just going to make an almost frivolous comment. At the COP in Copenhagen, which, if I recall, was COP 15, there were 45,000 people. Is it not time for the COP to start using videoconferencing instead of people being transported all around the world?

Chris Stark: The event is enormous—it is a sort of mini Olympics. It would be much bigger if we were to host it in 2020. As a good Glaswegian, I make a bid for Glasgow to host it.

Claudia Beamish: I was not sure that I would have the time to ask this question, but I want to go back to the 2030 targets. I was very pleased that the CCC acknowledged the UK's historical climate debt. Has equity been, or will it be, factored in to the 2030 interim targets, as well as the 2045 net zero targets and, if so, how?

Chris Stark: When we come to make a more detailed assessment in the light of better information at UK level, we will boil up a number of things, including, I am sure, equity considerations.

The Convener: We have talked about various opportunities in development of technology in various sectors, and the just transition to a carbon-neutral economy. What can Governments do to ensure that all the opportunities for work and industry stay in the countries that take on the challenges early, as Scotland is doing, and as the UK might do?

Chris Stark: It is hard to give a quick answer to that question, except to say that it is important that such strategies be put in place. I suppose that we could just lurch at the targets with policies that get us some of the way there in the short term and which we hope will still be there in the long term, but that is not an effective strategy. It would damage the overall task of reducing emissions. Instead, we need for the whole economy a set of strategies, including for growth and jobs, that are compatible with reaching net zero emissions.

This is just a personal reflection on the story of renewables in Scotland, but if 10 or 15 years ago we had been as ambitious as we are now being about growth of the offshore and onshore renewables sectors, we would have developed a bigger homespun industry for them. Of course, there would have been some parts of the industry that we still would not have developed. The UK and Scotland have been pretty good at catching the high-value bits of those sectors—a topic that is not oft discussed—but we could have had more. The most successful strategies are those that bring everyone along, so I would love it if we were to think about net zero not just as an emissions reduction challenge, and not even just as a whole-economy question, but in terms of how to build in the right jobs and get the right skills to achieve it.

The Convener: I realise that we have asked a lot of questions this morning, but is there anything that we have not covered that you would like to mention in final points? We can give you a good seven minutes.

Chris Stark: With regard to some of the coverage that we have received, I just want to make it clear that we have not been fighting with Nigel Lawson and that we have been having a good discussion with the extinction rebellion movement. That, to me, represents remarkable progress, because it demonstrates that we are discussing climate change in a way that we were not doing 20 years ago. There is now broad consensus that the issue needs to be focused on and fixed.

That said, a parallel point to make is that, although the discussion since our report was published has been good, there is still a feeling that we can do something even more quickly. I would love to see that happening, but I would also love to see us focus on a credible strategy to do that, because we are, in many respects, talking about a set of physical barriers that prevent us from reaching the target sooner. We should not just lurch into considering that we can put a policy in place—we have to think carefully through its implications.

The report is as ambitious as the CCC has ever been, and gives us a platform from which to say credibly that we are among the most ambitious countries in the world when it comes to emissions reduction. We might, in the future, be able to bring forward the target date, but the evidence at the moment does not support that.

I have occasionally seen the strategy being described as “unambitious”. That is very far off the mark, which I want to put on the record here. Were we to deliver the strategy globally, that would be a huge statement. The Scottish Government has done the right thing by setting the 2045 target in the bill. When the UK does the same, we will be in a remarkable position.

However, the task of delivering that is enormous; we have never successfully achieved the kind of transition that is required. The policies to deliver it are not in place at the moment, so we need a different sort of integrated discussion between the UK and Scottish Governments if we are to achieve the target.

Professor Bell: I am an engineer, so I am interested in the system and its elements working. We have to get a much better understanding of the interactions between them and the detailed engineering challenges. As a nation, we are tackling that piecemeal at the moment, so we need to get much more serious about that. A system-level perspective includes understanding how the different investments might happen and how they are influenced by policy levers such as market mechanisms and regulations.

We are very slow in making progress in understanding things at system level, which we really have to do. Any changes in Ofgem are generally about thinking in silos about electricity or gas and are very rarely about the interaction between them, and change seems to take forever. Unfortunately, I do not have a magic wand to wave to speed it all up. We have to take those things much more seriously.

The Convener: Does the same go for Government departments?

Professor Bell: Yes.

Chris Stark: There is a huge integration task. The Scottish Government has a more integrated approach generally, because it does not have the Whitehall system. However, I can say from bitter experience that there are still silos in the Scottish Government. There is, however, a more integrated discussion in Scotland about what needs to be

done. For example, in my former role as director of energy and climate change in the Scottish Government, I was able to make housing policy, which was amazing. We would not find that happening in Whitehall.

I do not underestimate the overall governance challenges. We did not try to draw out that point in the report, but it is definitely an inference that can be drawn. Achievement of net zero emissions requires a level of integration, at every level of the Government and between Government departments, that does not exist at the moment. We say in the report that net zero needs to be among the top priorities in all departments that have key levers, but that is not the case at the moment. Net zero will not be achieved if it is only a second-order priority in BEIS, for example. Good as the stuff that has been coming out of BEIS is, net zero must be given a much more prominent role overall in the Government's mission.

Professor Bell: Can I ask Chris Stark a question?

Professor Forster: I will just make a point. The issue is not just Government integration: we have to get better at taking integration out to the community—the agricultural community, the towns and cities of the UK and even palaces and villages. We have to get better at integrating and communicating opportunities across all levels of the community. It is not a role that is just for central Government. There are also opportunities internationally, which we have talked about. Adoption of a clear target is one thing, but we must also set up the ambition to realise the early opportunities.

The Convener: I am interested to hear Keith Bell's question.

Chris Stark: I am, too.

Professor Bell: Do the Government departments have support behind them in terms of analytical capability and expertise?

Chris Stark: It is so easy for me to sit here and say that they do not. One of the great services that the Committee on Climate Change offers is the integrated view, but it is not acceptable that we are the only people offering that at the moment.

I would love the Government to invest in the analytical underpinning that will deliver net zero emissions. That would mean that we would have to be much more conscious of one Whitehall department's decisions' knock-on impacts on other departments. There needs to be a force in the middle that co-ordinates that properly. It does not need to be the Treasury or number 10, but it needs to be someone who has an interest in each bit and each layer of Government and how they co-operate.

None of that will be achievable unless there are in Scotland and Whitehall fully fledged strategies that work together. Again, I say that I am optimistic about the ability to do that and to bring it all together, but it will require everyone—civic society and Governments—to focus on the overall goal.

The Convener: I thank you for your time this morning.

11:30

Meeting suspended.

11:40

On resuming—

Annual Report 2018-19

The Convener: Item 2 is consideration of the committee's draft annual report for 2018-19. Members have had a good look at the draft; are there any comments?

Stewart Stevenson: This is a very minor issue, and I hope that I am not speaking out of turn on it. I think that Finlay Carson, who is sitting next to me, agrees with me. We are not keen on the colour and intensity of the background for the team photograph.

The Convener: My copy is in black and white. Which photograph are you talking about?

Stewart Stevenson: It is on page 1—

The Convener: Okay. We can adjust that.

Stewart Stevenson: I am not going to direct you to do that—

The Convener: Is it not getting your skin tone right?

Stewart Stevenson: It is just that the background is very intense and of a colour that is not terribly friendly to figures.

The Convener: Okay. We will adjust that.

Finlay Carson: It looks a bit like "Star Trek".

The Convener: Is that not quite cool?

I have a comment. I think that it is important that we consider the gender breakdown of the people who have given evidence to the committee. There is a drive for 50:50 parity and we are improving, year on year, but it is important to be up front about where we are.

Mark Ruskell: I agree. We reported on the matter last year, and we contacted witnesses so that we could incorporate their feedback on the experience of giving evidence and how meetings were run. It would be good to report on the gender breakdown again this year.

The Convener: Yes. If there are no more comments, is the committee content for me to sign off on the final version of the report, with the adjustments that we have just talked about?

Members *indicated agreement.*

The Convener: Thank you. That concludes our business in public. The next meeting will take place on 15 May—tomorrow. We will take evidence via videolink from the Rt Hon Michael Gove MP, the Secretary of State for Environment, Food and Rural Affairs.

11:42

Meeting continued in private until 12:05.

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