TRANSPORT, INFRASTRUCTURE AND CLIMATE CHANGE COMMITTEE

Tuesday 27 January 2009

Session 3

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TRANSPORT, INFRASTRUCTURE AND CLIMATE CHANGE COMMITTEE
4th Meeting 2009, Session 3

CONVENER

*Patrick Harvie (Glasgow) (Green)

DEPUTY CONVENER

Cathy Peattie (Falkirk East) (Lab)

COMMITTEE MEMBERS

*Rob Gibson (Highlands and Islands) (SNP)
Charlie Gordon (Glasgow Cathcart) (Lab)
*Alex Johnstone (North East Scotland) (Con)
*Alison McInnes (North East Scotland) (LD)
*Des McNulty (Clydebank and Milngavie) (Lab)
*Shirley-Anne Somerville (Lothians) (SNP)

COMMITTEE SUBSTITUTES

Alasdair Allan (Western Isles) (SNP)
Gavin Brown (Lothians) (Con)
David Stewart (Highlands and Islands) (Lab)
Jim Tolson (Dunfermline West) (LD)

*attended

THE FOLLOWING GAVE EVIDENCE:

David Kennedy (Committee on Climate Change)
Dr Andy Kerr (University of Edinburgh)
Phil Matthews (Sustainable Development Commission Scotland)
Professor John Mitchell (Met Office)
Professor Peter Smith (University of Aberdeen)
Katherine White (Committee on Climate Change)

CLERK TO THE COMMITTEE

Steve Farrell

SENIOR ASSISTANT CLERK

Alastair Macfie

ASSISTANT CLERK

Clare O'Neill

LOCATION

Committee Room 1

Scottish Parliament

Transport, Infrastructure and Climate Change Committee

Tuesday 27 January 2009

[THE CONVENER *opened the meeting at 14:00*]

Climate Change (Scotland) Bill: Stage 1

The Convener (Patrick Harvie): Good afternoon. Welcome to the fourth meeting this year of the Transport, Infrastructure and Climate Change Committee. I remind everyone present that all mobile devices—phones, BlackBerrys, pagers and so on—should be switched off.

There is just one item on the agenda for today's meeting: continuation of our consideration of the Climate Change (Scotland) Bill at stage 1. This is our second evidence-taking session on the bill. Today, we will hear first from experts in the field from the Met Office, universities and the Sustainable Development Commission Scotland, and then from the United Kingdom Committee on Climate Change. We expect to continue taking evidence until some time in March, at which point we will hear from the Minister for Transport, Infrastructure and Climate Change and publish our report. In addition to taking oral evidence, we have issued a call for views on the bill; the deadline for written responses is 27 February.

Without further ado, I welcome the first of our two panels. We are joined by Professor John Mitchell, director of climate science at the Met Office; Professor Peter Smith, professor of soils and global change at the University of Aberdeen; Phil Matthews, senior policy adviser at the Sustainable Development Commission Scotland; and Dr Andy Kerr of the University of Edinburgh, who is the assistant director of the Scottish alliance for geoscience, environment and society. I invite the witnesses to say some brief words of introduction before we get started with questions.

Dr Andy Kerr (University of Edinburgh): I need to add that currently I am seconded part-time to the Scottish Government's climate change team to work two days a week on its strategic overview project, about which the committee has heard. The project is concerned with delivery of whatever targets are set by the bill.

The Convener: I will kick off the questioning. When considering the bill, we are interested in hearing about the most recent climate science, to enable us to judge whether the approach that is being taken in the bill and by the Government more generally is up to the mark. Could you provide us with a synopsis—it may need to be a brief one, given the complexity of the subject—of how the science has moved on since the 2007 report of the Intergovernmental Panel on Climate Change was published?

Professor John Mitchell (Met Office): The IPCC report came out just over a year ago, by which point the science that it contains was about two years old. The biggest change that has taken place since then is that there is now more emphasis on trying to understand the probability of different levels of climate change. The word "probability" is relevant to the bill. For example, our current understanding is that reducing emissions by 50 per cent by 2050 would give us a 50 per cent chance of keeping warming down to 2°; an 80 per cent reduction in emissions would bring the chance of warming exceeding 2° down to 10 per cent. However, it is necessary to emphasise that this is cutting-edge science, and that both the mean level of change and levels of uncertainty may change. For example, the IPCC included in its report only at a late stage the effects of changes in the carbon cycle, which tend to push temperatures up slightly. When considering legislation, the committee must be aware that, in 10 years' time, the numbers may be different.

My second point, to which we will probably return during the session, is that when considering measures to reduce emissions and to monitor what is happening, we must take into account not only climate change but climate variability in the future. For example, it is proposed to check emission levels every year; a very cold winter will increase space heating, which will push up emissions in that year, but the position may be different in the following year. Therefore, when you are considering measures, you must take into account not only climate change but climate variability.

The Convener: For clarity, are the 50 per cent and 80 per cent reduction figures to which you refer global figures?

Professor Mitchell: Those are global figures.

The Convener: So they are the figures before we get into any policy decision about whether richer countries should make deeper cuts and so on.

Professor Mitchell: Exactly.

Professor Peter Smith (University of Aberdeen): On mitigation, which is my specialist area, the work since the publication of the IPCC's fourth assessment report has focused on identifying and better quantifying the economic costs of mitigation—how much we can do with a given range of measures across all the sectors, what that will cost and how it will play out across

the sectors. Many of the studies that have appeared since the assessment report have drilled down into the individual sectors to look at the measures that are available and to cost those to see how much we can achieve and how much it would cost to get there.

The Convener: The bill uses the IPCC report as its basis and the Government will also use advice from the UK Committee on Climate Change as a basis for determining its approach to the issue. Could the Government incorporate more recent scientific evidence and data into the bill? Is there a more appropriate way in which it could ensure that, once the bill is passed, further scientific developments are brought into Government thinking?

Professor Smith: As I understand it, the Parliament will take advice from the UK Committee on Climate Change and from a Scottish committee on climate change—is that correct?

The Convener: That is one of the possibilities for which the bill allows, although we have heard that the Government does not intend to propose the creation of such a committee in the immediate future.

Professor Smith: Clearly, that would be the main mechanism through which to get such information and to enable cutting-edge scientific understanding to be fed through to inform the passage of the bill and, after the bill has been passed, further decisions on setting and achieving annual targets.

Professor Mitchell: A couple of things are coming up. One is the UK climate impacts programme, which will produce its new scenarios by—I hope—21 April. That will help, perhaps not so much with mitigation as with adaptation. Those scenarios will be quite an advance on UKCIP02 and they cover all the United Kingdom, so they will be of interest.

My organisation provides advice to the Westminster Government through the Department of Energy and Climate Change and the Department for Environment, Food and Rural Affairs, which fund us, but we are able to advise where that is helpful.

The nice thing about the IPCC is that it ensures that there is a consensus. If you are looking for more recent advice, you have to trust the people whom you are asking; it is a matter of judgment.

Dr Kerr: I will add to what Pete Smith said, which is that if you are going to bring in the latest science, all that you need is a repeat cycle so that you keep checking against the latest science that comes out. As long as you have a process for doing that, you can update your targets a few years out. My understanding is that the bill delivers such an approach.

The Convener: Do any of the witnesses want to comment on where we are in the development of a global deal on climate change? The process attracts a certain amount of press attention and it is one in which the Scottish Government has some level of participation, but perhaps less than the Government of an independent country. Without getting into whether that would be desirable, where do you think we stand in relation to that process?

Professor Smith: I guess that you are referring to the Bali road map, which is in place. The meetings that took place in Poznań were to enable the various interested parties to position themselves with respect to the main decisions that will be taken in Copenhagen, so it would be premature to say now what we imagine will be in any agreement that is reached. The really important thing about the Bali road map is that it includes not just the developed countries, as the Kyoto protocol does, but the developing countries. Given that, from an emissions perspective, developing countries such as India and China, the economies of which are in transition, are jumping ahead of some of the formerly industrialised countries that were covered by the Kyoto protocol, it is extremely important to have those countries on board for any meaningful global climate agreement. Whatever agreement we reach, we need to have more global coverage than we had under the Kyoto protocol.

Dr Kerr: I will make two points. It is clear that one of the great sticking points has been that countries such as China and India have required the USA to be involved substantively in delivering emissions reductions, which has not been the case until now. Comments by the new President suggest that the USA will get on board, which might be grounds for optimism, but if one talks, in particular, to businesses and carbon market players in the City of London, it is fair to say that there is a degree of scepticism about whether the Copenhagen talks will deliver a meaningful global deal, as opposed to a series of regional deals, which appears more likely. It is difficult to say; that is just conjecture.

Professor Mitchell: It is too early to say exactly how the US position will change as regards engagement in emissions reductions. We might be optimistic, but we should wait and see what happens. Through the World Meteorological Organization, I have been involved in organising the next world climate conference, and the US has been highly reluctant to engage in anything involving climate change. It is too early to say whether that has changed—the President has just been inaugurated—or in what direction it might

change. It might not change in the direction that we expect.

The Convener: Before we move on to the next set of questions, I should have recorded at the beginning of the meeting that Cathy Peattie and Charlie Gordon have sent their apologies. That is on the record now.

Alex Johnstone (North East Scotland) (Con): As practitioners in the field of climate change science, do you feel that the Scottish Government has properly exploited your expertise in framing the Climate Change (Scotland) Bill and other proposed legislation that might take climate change into account?

Professor Mitchell: From my point of view—this is the second committee that I have appeared before—you have tried to take into account a range of scientific opinion and, so far, that has been done well.

Alex Johnstone: I am trying to get at whether, in this bill and in other proposed legislation, the Scottish Government is up to speed with scientific opinion. Is there any lag? Is more effort required?

Professor Smith: The Government—as in the civil service part of the Government—is consulting and has had a number of meetings. More broadly, outside the Government specifically, the public consultation on the bill has allowed various groups and interested parties to feed in. From my perspective, that process has been completely open and inclusive. The Government has taken the necessary advice and has contacted the main players. As far as I am aware, no one in the scientific community has felt excluded from that process.

Dr Kerr: An issue from my perspective is that all Administrations, certainly in the United Kingdom and in most other European countries—it is not just to do with the Scottish Government or any particular Administration—have had a significant problem with delivery, as opposed to the setting of targets. They might well set targets that are based on science, but it is clear from their emissions inventories that there has been a problem with how those targets are delivered. One of the key issues is delivery rather than the use of science to set targets in the first place.

14:15

Alex Johnstone: The bill consultation stated that one of the reasons for legislating in the first place was

"to create and enable new means of reducing emissions."

Are any of the means in the bill to achieve Scottish targets new? Are any of them world leading?

Professor Smith: I would say that there is nothing new under the sun. We have known for a long time that planting trees will deliver carbon sequestration, for example. Some measures are specific to Scottish circumstances, such as the muirburn provisions, which you will not find in many other places, simply because muirburn is not an issue in many other countries. The bill also covers land use, land use change and forestry emissions that are specific to Scotland.

The targets are ambitious. There are no more ambitious targets anywhere else in the world, although some other countries are also aiming for an 80 per cent reduction in emissions by 2050. The targets are brave, bold and world leading in that respect.

Professor Mitchell: I want to comment on the measures and their relative effectiveness. Carbon credits are a one-off. In a sense, you buy the emissions for the year and that is it. If you want to keep the emissions down to that level, you have to repeat the exercise each year or find a replacement.

Forestation is a fairly short-term measure in terms of the carbon cycle because, after a while, the forest reaches maturity and no more carbon is being fixed. One has to be aware that forestation is not so effective in areas of prolonged snow cover, because there begins to be an albedo effect: the trees make the ground appear black and there is more heat, particularly in spring, when the sun comes up. The main point is that to keep the benefit, the land has to be kept forested—it saturates if it is kept forested. How you frame the conditions on which land is let out to forestry will have to be managed carefully, so that people do not take the money for putting forests in and then take them away again, in which case you would lose the benefit.

I know that in Northern Ireland they have been looking at carbon capture and sequestration in the area between Larne and Portpatrick. I am not sure to what extent you have looked to Northern Ireland or Norway to see what can be done. Scotland has a lot to learn from countries that are in an equivalent geographical position and have similar vegetation. In relation to muirburn, it might help to find out what is happening in similar countries.

Dr Kerr: Can I just clarify your question? Are you talking about measures such as the energy efficiency action plan and the measures in relation to public sector organisations, or are you talking specifically about the natural science?

Alex Johnstone: In effect, I am talking about both, but we are looking primarily at the provisions in the bill. I am interested to know whether you feel that we have achieved anything unique in Scotland, particularly in the bill.

Dr Kerr: I back up Peter Smith's point: I am not aware of any more stringent targets in any other country. On the measures to reduce emissions, it is my understanding that the bill is enabling legislation and that other pieces of work will have to be brought forward.

It is worth flagging up that we have to work within the context of the UK and the European Union when it comes to a number of these measures. For example, we know that the UK Government is going to bring forward the renewable heat obligation. Scotland will need to work within that context. The bill will have to work hand in glove with the legislation that is coming through at Westminster. I imagine that that can be done by providing enabling powers, although you will understand the process better than I do.

The main gaps in terms of economic instruments to reduce emissions will be in the domestic heat sector, so a heat obligation is important. Everyone recognises that energy efficiency is critical, but it is still very hard to achieve. Transport is also important. Some of these things relate to reserved powers, some are EU functions, and others are things that can be done in Scotland by local authorities and local agencies. I suspect that it is difficult to put all that into one bill, rather than saying that you will have enabling powers that will deliver measures elsewhere.

Shirley-Anne Somerville (Lothians) (SNP): Could you explain the importance of cumulative emissions? Is it technologically possible to measure them and, if so, how would that be done?

Professor Smith: If by cumulative emissions you are talking about the emissions that have accumulated since the industrial revolution—

Shirley-Anne Somerville: Sorry—I am talking about what is going to happen. The bill contains annual targets, but it is also concerned with what goes under the graph, if you like, and with cumulative emissions up to 2050.

Professor Smith: I misunderstood. I will pass the question over while I have another think about it.

Dr Kerr: There are two ways of finding out emissions from Scotland, the first of which is the annually published emissions inventory. However, one problem with that is that it is 20 months in arrears. The second way is the allocation of auctioning rights in the traded sector. Using both, you can get a sense of what the net Scottish emissions will be and adding them up over the years will give you a figure for cumulative emissions. In that sense, the information is available if you want to understand what the total emissions block will be up to 2050 and whether we will meet the stretching targets that you set.

Phil Matthews (Sustainable Development Commission Scotland): I also assume that you are referring to the area under the curve of emissions between now and 2050. The bill sets out a broad trajectory of gradual reduction in emissions up to 2020, followed by a 3 per cent reduction per year from 2020 and perhaps a 4.5 per cent cut per year after 2030. The steepness of the curve between now and 2020 is actually quite important to the overall carbon budget to 2050; I believe, for example, that it has been calculated that an additional 200 million tonnes of carbon will be generated by following that path instead of having a linear 3 per cent cut from now onwards.

The commission recognises that, in the immediate term, it is hard to move beyond what we are doing, but we would like to get much closer to 3 per cent per annum before 2020 instead of setting that as the benchmark for the 3 per cent annual cut. That approach will be important to our overall impact on the climate over the 40 years covered by the bill.

Professor Mitchell: The theoretical attraction of using cumulative emissions is that, because carbon dioxide has such a long lifespan, they probably indicate what long-term global climate change will be. However, as far as the bill is concerned, it is less clear how such an approach is relevant to a particular country that is trying to restrict its own emissions.

Dr Kerr: Many of the policy statements that have been made have been about cutting emissions by 3 per cent a year. Of course, 3 per cent of a large number is bigger than 3 per cent of a small number; as a result, there will be a very steep drop to begin with. However, because of the momentum in economies, emissions reduction will almost always take the form of an S-shape; almost all economies will reduce slowly to begin with, sharpen up in the middle and slow down again when they have to deal with the really challenging stuff at the end. I think that, instead of the assumption that emissions will simply drop away to begin with, that is a more pragmatic view of how emissions will be reduced.

Shirley-Anne Somerville: Have any other countries—large states or whatever—set cumulative emissions targets rather than annual targets in their climate change legislation?

Phil Matthews: I am not aware of that. Given that, to my knowledge, the UK and Scottish bills are the first of their kind in the world, we cannot draw on other evidence.

Alison McInnes (North East Scotland) (LD): The fact that, as Dr Kerr pointed out, the emissions inventory runs 20 months in arrears has always concerned me. Has anything been done to

speed up the process? How important is it for such information to be reported sooner?

Professor Smith: The inventory runs behind because the activity data for a given year need to be collected and pulled together. Although one could improve the efficiency of an inventory process, there is only so much that can be done. After all, a certain amount of time will always have to elapse before one can feasibly collect necessary statistics such as livestock numbers, afforestation rates and fuel consumption. Although the delay could be reduced from 20 months, a reduction to 12 months would be the maximum that could be achieved even if there was an instantaneous evaluation.

Alison McInnes: Would it be worth while trying to report within 12 months rather than 20 months?

Professor Smith: Under Kyoto accounting, reporting must be done at the end of the first commitment period, which is in 2012. Reports will be made more or less at the end of that period for the previous five years. Once we reach critical periods such as that, one would hope that annual reporting targets could speed up that process, but we will still be reporting at least one year in the past because that is where the data for the period come from.

Dr Kerr: The international standard is that reports must be made 15 months in arrears of the end of the year, so a 2006 report should be published in March or April of 2008. The Scottish statistics are published five or six months later. Presumably, we could get that back to somewhere closer to the international reporting requirements. However, we are unlikely to beat those requirements, so there will be a limit to how much can be achieved.

On the question whether the delay affects things, the answer is yes. If Scotland does not achieve its 3 per cent cut by 2021, we will find that out only in 2023. By the time that we have done anything about that, it will be 2025 so, yes, you bet it makes a difference. Such delays create all sorts of problems with the whole principle of having annual targets as opposed to carbon budgets.

Shirley-Anne Somerville: Is it feasible to measure and report on the emissions generated anywhere for goods and services that are used in Scotland?

Phil Matthews: That is consumption-based reporting. We support the Government's general approach of using source-based emissions as the basis for the Scottish target. In our view, it would be useful to have an indicator of our wider carbon footprint or wider consumption in parallel with that, given that the two issues have been closely linked over the past 20 years. For example, in closing Ravenscraig and importing steel from the far east, we are still using something that is part of our overall carbon impact on the global economy. I would say that, yes, consumption-based reporting is important and, yes, it can be calculated. Within the national performance framework, the Government already has an environmental footprint indicator from which—as I understand it—our carbon footprint could quite easily be extrapolated.

Dr Kerr: It would be great if such reporting could be done, but it will take a while before the standards of reporting around the world are appropriate. We have global movements of goods, but the standard of reporting for emissions inventories is reasonably good in countries that are liable under the Kyoto target and pretty weak in countries that are not liable under Kyoto. There will always be a challenge in dealing with that sort of trade of goods.

Shirley-Anne Somerville: You suggest that there will be a time lag. When might the reporting be statistically strong enough?

Dr Kerr: I would not like to conjecture, to be honest.

Professor Smith: We are limited by the capacity to collect those sorts of data in the countries from which we import. Whereas many industrialised countries have what the IPCC calls tier 2 or tier 3 methods that use national bases and fairly sophisticated models for calculating emissions, many developing countries use tier 1 methods that just use default emission factors, which are not specific to their region. Generally speaking, I think that there is a greater uncertainty associated with the emissions inventories of developing countries. The only way to improve that would be to increase the capacity within those countries to move from tier 1 reporting to higher tiers of reporting. Perhaps that could be done through capacity building to improve the way that we report globally.

Shirley-Anne Somerville: Do the emission tracks that the Government has outlined—mention was made earlier of the line that the Government is assuming in the bill—reflect any of the global emissions deals that are happening? Are they flexible or stringent or optimistic enough?

14:30

Phil Matthews: The Scottish trajectory is towards a cut of 50 per cent by 2030. The cut that the Committee on Climate Change recommended as a potential target by 2020, which could be a cut of up to 42 per cent from 1990 levels, is a more ambitious target than what we have in Scotland. Obviously, Scotland is part of the wider UK act as well, but I am not sure that our target is as ambitious as the one in the UK act.

Dr Kerr: You will hear from Katherine White later, but the interim target of a reduction by 2020 of just over 34 per cent from 1990 levels, which includes Scottish emissions, was deemed to be done within the UK. The expectation was that a lot of credits would be purchased to help to deliver on the more stringent target of 42 per cent. It is not entirely appropriate to use an identical system to that which is laid out in the Government's technical note, which talks primarily about internal emissions production.

Shirley-Anne Somerville: Based on the current scientific consensus, do you have a view on the 2030 and 2050 targets in the bill?

Phil Matthews: I take on board what Andy Kerr said earlier. Obviously, we cannot turn the economy around overnight. We are likely to see an S shape as we get all the mechanisms in place, proceed to more stringent cuts, and finally, when the low-hanging fruit has gone, complete the last stuff, which will be quite hard to achieve. However, I still think that we can do more between now and 2020 than just move on from the business-as-usual case that we have at present, with cuts in emissions of about 1.25 per cent per annum. I do not know how it could be included in the bill, but it would be good to move more quickly than the bill suggests towards annual cuts of 3 per cent by 2020.

Professor Smith: There are two factors that influence the rate at which we can change. We can change things quickly by taking the easiest and cheapest mitigation options that we can identify. Those are the options that we can adopt fairly quickly. From that perspective, we can make a large cut in emissions relatively quickly. However, there is inertia in some of our systems and institutions. We have to strike the right balance between taking the quick and easy options that we can identify and implement relatively quickly and tackling the inertia that we encounter in the system as we try to change things. Some of the changes that are required involve large changes to infrastructure. Some things will cost more but will be easy to implement once the infrastructure has changed. Some things will be relatively easy and cheap to implement. The target needs to strike a balance between those competing pressures.

However, I agree with Phil Matthews about the interim targets. It is great that we have an 80 per cent target by 2050 and a 50 per cent target by 2030, but it would focus our minds a little more if we had a more stringent target in the nearer future, such as in 2020.

Dr Kerr: I agree that Scotland can do better than scenario 1 in the technical note suggests. I wrote a paper a couple of years ago on the extent to which lots of different industrial countries had reduced their emissions, and not a single country had managed to reduce emissions year on year by more than 1 per cent except those that were going into a major recession or depression, which will deliver reductions quite easily. I impress on members the fact that radical changes will be needed in the next few years in the production and use of energy and the use of land. Whatever the trajectory is over the next 10 years, the key is to put in place the processes and policies that will deliver the cuts of 3 per cent and more that are required thereafter.

I will give an example from transport. Everyone is talking about going electric with hybrid cars. Large-scale commercial production of such cars around the world may start in about 2014, but would you buy a plug-in hybrid car unless there was electrical charging apparatus in every town and city throughout Scotland? Your answer would be no.

Scotland can put in place policies, programmes and infrastructure that will not reduce emissions now but which will enable really radical changes in the future. Regardless of what targets you set, in the next 10 years you can deliver renewable heat and electricity opportunities within the domestic sector—although renewable electricity is tied to the traded sector—and get the transport infrastructure sorted out. Those measures will not necessarily be reflected in the emissions inventory but they are critical to delivering the longer-term radical cuts that we are talking about.

The Convener: There has been some discussion of the annual targets and the trajectory in emissions reductions that are expected from the bill. Professor Smith described the momentum in the system that makes it more likely that the economy would achieve an S-shaped curve in reductions rather than more sudden or stark cuts. We have acknowledged that cumulative emissions over time will determine whether we contribute to dangerous climate change. Is the S sufficiently curvy, if I can put it that way, to avoid that? Do any of the witnesses have a view on the suggestion that the bill's long title should explicitly refer to the Government's contribution to the avoidance of dangerous climate change and include a specific figure for 2050?

Professor Smith: Including "dangerous climate change" in the long title would not add anything other than complexity and lots of argument about what the phrase constitutes. My preference would be to leave it simple, but that is up to you guys.

The less stringent the annual emission reduction targets are now, the more stringent they need to be in future. Andy Kerr commented that the best that has been achieved so far is a 1 per cent year-on-year reduction, so we already have fairly ambitious targets. However, just as we do not

want to load future debt on to our children, we do not want to load future emissions reduction commitments on to them. My preference, not as a Scottish citizen but from a climate change perspective, would be to have a sharper reduction and to try to identify some low-cost or even negative-cost options that could be implemented quickly to put us on the right track. The S-shaped curve could be steeper at the beginning.

The Convener: It could be steeper at the beginning than is suggested by the range of targets that are made possible by the bill.

Professor Smith: That is my opinion. Having said that I do not think that this will be easy. It will be tough to do the job that we are trying to do, and we need to balance out how realistic we are being. However, from the climate change perspective, more radical mitigation early on would be preferable.

The Convener: Some people suggest that, as Dr Kerr perhaps hinted, if an economy experiences a spike in energy prices followed by a recession, its emissions might go down as a result. It is not necessarily simple to predict whether that will happen, but it is a scenario that might occur. Given the situation that we are in, could we not expect more ambitious reductions in the early stages and require that, should the recovery materialise as expected in a couple of years, it must be sustainable in the fullest sense of the word and based on policy changes that we can put in place before then?

Professor Smith: Reduced demand and consumption should reduce emissions, but we must also develop the infrastructure to ensure larger reductions in emissions later on. Although we would rather not be in the current economic situation, it may lead to some short-term windfall benefits through a reduction in greenhouse gas emissions. However, the same economic situation may reduce the opportunities for investment in infrastructure that would lead to larger reductions in emissions later on. Andy Kerr spoke about electric cars and the need to put infrastructure in place for them. Infrastructure is also required to feed the results of microgeneration back into a large electricity grid for distribution, and that will require investment.

The recession—if it is a recession—will work in two ways: there will be a short-term windfall benefit, but there will also be threats to future investment in infrastructure.

Dr Kerr: We should also flag up the difference between the traded sector and the non-traded sector. Emissions from the traded sector are fixed by the number of allowances across the EU. Those are now set until 2020, regardless of whether people use them up or—if there is a recession—do not use them up. If people do not use their allowances this year, they will be able to keep them until 2018 or 2019. As a result, the nominal emissions in Scotland from the traded sector are fixed until 2020, regardless of what happens with end-of-year emissions.

The non-traded sector—for example, domestic heat, agricultural land use and much of transport—is a different issue. Emissions have come down, but can we drive them down further? Yes—absolutely. However, we have to distinguish between what Scotland can deliver and what has already been fixed at international level for the future.

The Convener: Should we simply accept that the traded sector can defer its emissions reductions if it does not use up its allowances, or should we challenge that assumption?

Dr Kerr: You can challenge it, but the place to do so is the European Commission. The challenge will be to get 27 member states to agree.

The Convener: I am told that that can be complicated.

Dr Kerr: Yes.

The Convener: Are there any more comments on the trajectory and on whether we could be more ambitious in the early stages? Would there be value in that? Would it be achievable?

Professor Mitchell: There is an obvious comment: it is a bit like paying off your mortgage. The sooner you start, the easier it is.

Professor Smith: I wish I had thought of that analogy.

The Convener: The Government has said that it will bring forward batches of targets, rather than set targets year by year. What issues should the Government take into account when it determines what the targets in the first batch ought to be?

Phil Matthews: The first batch goes up to 2022, so it covers the period up to and beyond the time when we are definitely aiming for 3 per cent reductions, even based on what is in the bill at the moment.

It is important that a clear steer is given every year to the business sector and the public sector on the reductions in emissions that are expected. However, it is also important that, towards the end of the period, we ensure that the slope in reductions is steeper.

Dr Kerr: If, because of any recession, emissions reduce in the next year or two, we should take that starting point and then consider the non-traded sector's potential for reductions. We should then set targets that are a real challenge, so that the sector delivers right at the limit of what it can

achieve. That is how to push things forward. However, in order to help the sector reach those targets, you will have to vote through the right policies and measures. That may be the most challenging part.

The Convener: So this is about not only achievability but sending a signal. Are we talking about sending a signal that the handle will be turned further each year?

14:45

Dr Kerr: I would have thought so. We need to balance achievability against wanting emissions to be as low as possible. A fair approach would be to set out what is achievable and push it as hard as we can.

Rob Gibson (Highlands and Islands) (SNP): The bill contains no sectoral targets. Would it make sense for specific sectors to be given more scrutiny and policy direction in relation to annual emissions targets?

Dr Kerr: There should certainly be more scrutiny, but I am not sure whether it would be sensible to have specific sectoral targets. The more we salami slice an economy down to specific regional areas or industries, the more costly it is to deliver overall emissions reductions. However, it is clear that certain sectors have not delivered. For example, neither the transport sector nor the residential heating sector has delivered because neither sector has serious economic instruments for reducing emissions. We can pinpoint areas that have not delivered at all over the past eight to 10 years, which we must scrutinise particularly carefully. Given the Committee on Climate Change's figures for the UK as a whole, many sectors will have to deliver dramatically more than they have done in the past few years. If one or two of them do not deliver what is required, it is clear that the overall target will not be hit. There is therefore a requirement on them all to deliver far more than they have done.

Professor Smith: It is useful to maintain the flexibility of not having sectoral targets at the outset because that allows the Government to choose the policy instruments that it feels are appropriate for each sector's prevailing economic situation. If one analyses how much potential different measures can have in a sector and how cheaply that potential can be achieved, one can then assess where to get most bang for our buck across the sectors and implement a range of policies that will influence different sectors in different ways. Having separate sectoral targets at the beginning would be unnecessarily cumbersome and reduce the policy levers' flexibility to influence different sectors at different times.

Rob Gibson: Professor Smith referred to low-cost options for early action in certain areas. Is the domestic heating area one of those areas, given that it has the potential for energy efficiency as well?

Professor Smith: Yes—definitely. On the marginal abatement cost curve, energy efficiency is right down there as cost negative; it saves money and energy, so it makes a huge amount of sense. The question is why it is not happening. One must consider the educational, societal, institutional and economic barriers that prevent it from happening. If energy efficiency is cheaper, why are we not being more energy efficient? There must be barriers in the way. The policy levers ought to try to get in place energy efficiency and other mitigation or abatement options.

Rob Gibson: Given that, for most parts of the UK, winter has been colder this year than in the past 10 years, I wonder whether, despite the economic depression, more domestic heating has been used than before. Does that kind of variable highlight why we should make tackling the domestic heating issue a high priority?

Professor Mitchell: Yes.

Professor Smith: Yes.

Phil Matthews: There has been much discussion at the UK level of a green new deal. It is vital that, in seeking ways to get out of recession, we target investment at areas that are job-creation rich, which the home energy area is. That would create an awful lot of jobs, particularly for lower-skilled people. It would have huge social benefits and provide the carbon and environmental benefits that we want. In the short term, that would help to deliver those benefits and would give us time to wait for the technologies that might take longer to kick in.

Rob Gibson: To sum up, you think that scrutiny is the best way to achieve the aim—you have highlighted that for us. Thank you.

Land use, land use change and forestry are particularly important to Scotland. Will you explain why that sector is important to net greenhouse gas emissions?

Professor Smith: Our country has a large area and a relatively small population of 5 million or so. For an industrialised country, emissions from our land use, land use change and forestry make up a relatively large proportion of our total emissions. That is why the sector is important for Scotland.

As members know, agriculture emits fairly large amounts of greenhouse gases, which could be reduced. Forestry could provide a carbon sink to remove carbon dioxide from the atmosphere. We have a lot of land and quite a lot of forestry, and

the sector is larger in Scotland than it is in most other industrialised countries.

Rob Gibson: Given earlier remarks, are you saying that the best policy now is not clear fell but managed forestry, which will require working in a way that is very different from how the Forestry Commission has operated?

Professor Mitchell: That depends to an extent on what we are trying to achieve. If we are thinking of using wood as a renewable fuel we will continue to keep the carbon sink by deforesting and allowing forests to grow again. Wood is not particularly efficient, and processing and transporting it might involve extra costs. If a forest is used merely as a sink, some management might help as it becomes more mature. However, that is a short-term measure in the life of carbon dioxide, because when a forest eventually matures, respiration and so on will start to occur, which means that the amount of carbon that it can store is saturated.

Rob Gibson: Since the industrial revolution, woodlands in this country have vastly diminished, so it could be argued that it is important for Scotland to restore more woodland. I will leave aside the albedo effect, because it is increasingly the case that Scotland does not have much snow.

Professor Mitchell: A couple of centuries ago, deforestation contributed to early increases in carbon dioxide. Scotland does not have the problem of Brazil or some other tropical countries, which found that when they started to use renewable fuels they were pushing out areas that were used for food production. That is not the case in Scotland, so the measure seems appropriate for Scotland.

Professor Smith: Increasing the area of woodland is a key option. The only point to bear in mind is that there are appropriate and inappropriate sites on which to do that. Deep peats hold huge amounts of carbon, particularly in Scotland, which has massive reserves of carbon stocks. About 50 per cent of all the UK's soil carbon is held in Scottish peats, so we need to protect that resource. We could increase our sequestration by planting more trees, but we would need to do that in appropriate places and to ensure that we do not lose the large carbon stocks in our peatlands.

Rob Gibson: Does that apply to areas such as the east Highlands, where the only food source on the prospective land is grouse?

Professor Smith: We would need to look at the soil carbon map to decide that.

Rob Gibson: We must consider those large areas for such development, given the difference between the minerals in the soils there and those in the deep peat areas in the north and the west.

Professor Smith: One would need to consider the issue case by case.

Dr Kerr: There is a real issue with the emissions inventory in relation to land use, in the sense that landowners can undertake a number of abatement measures that will not get flagged up in the inventory as it currently is. The methods that are used to create the inventory will not necessarily flag up actions that are taken by landowners on a year-to-year basis. Until that is rectified, there is a real problem in using the emissions inventory.

Rob Gibson: For the record, how do you suggest that that be rectified?

Dr Kerr: We need annual surveys of land cover, and we need to change the methodology that is used to create the emissions inventory.

Professor Smith: At the moment, the inventory is too blunt a tool. It picks up land use change, but it does not pick up very well changes in the management of an individual piece of land. For example, if an area of cropland is managed differently from the way in which it was managed 10 years ago, that will not show up very well; however, if the land use changes from cropland to grassland, that will show up. We would need a new level of information and data to enable us to process that. As with all inventories globally, the activity data—the data on what is going on in management terms—are difficult to come by. Therefore, we would need not just a new inventory, but many additional resources to collect the statistics that would be needed to drive that inventory.

Rob Gibson: That is very helpful. Thanks. I have no further comments on that point just now.

Let us turn to international credits. The UK Climate Change Act 2008 places a duty on the Secretary of State for Environment, Food and Rural Affairs to set a limit on international credits on the basis of advice from the UK Committee on Climate Change. The Scottish Government does not intend to prescribe such a limit. Why might those different approaches have been taken?

Professor Smith: I do not know.

Dr Kerr: I do not know.

Rob Gibson: The UK Climate Change Act 2008 provides access to the levers at an international level that the Scottish Government does not have. Is that a reason? Could there be other reasons?

Professor Smith: I cannot comment.

Dr Kerr: The Scottish Administration has argued that it will not use carbon credits to meet its targets but that it is leaving the option open in case it

needs to do so in the future. If there is an international agreement at Copenhagen and the UK then buys in carbon credits to meet the Committee on Climate Change's intended target of 42 per cent, a certain number of those credits will be allocated to Scotland. In that scenario, the Scottish Government will have no choice but to accept a certain number of credits on behalf of the overall UK target. So, in talking about the traded sector credits, there are sometimes unintended consequences of which we must be aware.

I do not know why the Scottish Government has chosen not to set a limit. I cannot answer that.

Rob Gibson: We will have to dig into that a little further.

I will use two value-laden words: George Monbiot. In his critique of Lord Adair Turner's report, he suggests an immediate renegotiation of

"the European Emissions Trading Scheme, imposing a lower cap on carbon pollution and the mandatory sale of all emissions permits to the industries covered by the scheme (currently over 90% are given away)."

We know that the proposal has been watered down, in European terms, even since that report was published because of the fears of industry in Germany and Poland. How do those events bear on the intentions regarding the carbon trading accounts and so on, given the conversation that we have just had?

Dr Kerr: There was a fairly basic misunderstanding among some of the non-governmental organisations after the EU agreement in December. The environmental effectiveness of a trading scheme is set entirely by the number of allowances that are available. Whether those are given out free affects distributional consequences—who has to pay the money. If they are all given out freely to industry, that is fine as long as the cap comes down—the environmental effectiveness is not changed. What that means is that consumers pay more, as industries will pass the cost of the allowances on to consumers. So, there is an economic issue to do with industry in Poland and Germany getting more free allowances over the next few years.

Nevertheless, the original proposal that was laid out by the EU to reduce the number of allowances from 2 billion to 1.7 billion in 2020 is what was agreed, so the environmental effectiveness of the scheme is as it was proposed two years ago.

You need to distinguish between the distributional consequences of the proposal—who pays for it—and its environmental effectiveness, which is set by the cap. The proposal was certainly watered down, and many industries will get windfall profits out of it. However, in December, many NGOs did not pick up on the fact that we are dealing with two very different issues.

15:00

Rob Gibson: Thank you for that helpful explanation.

The Convener: Notwithstanding Dr Kerr's comments about the UK's relationship with the use of international credits, the Scottish ministers have stated publicly their intention to expend most of the effort to reach Scottish targets in Scotland. However, if the bill is passed in its current form, it will allow them to decide on the additional use of credits. If the Parliament wants to hold not just the current Government but future Governments to the pledge to expend the bulk of the effort on Scottish emissions reduction targets in Scotland, would it not be most effective for us to include a cap or limit in the legislation?

Dr Kerr: Yes. Two types of credits may be distinguished. One is an EU allowance within a capped system—many of those are traded and surrendered by Scottish installations. The other is something like a clean development mechanism credit, which is bought in from an outside source. If the committee wants to create a trajectory that guarantees that emissions from Scotland through to 2050 are below the curve and that cumulative emissions are at a set amount, it must impose limits.

The Convener: Would other witnesses like to comment on that issue or on the effectiveness of CDM credits? Are such credits a reliable way of achieving additional emissions reductions?

Phil Matthews: I support what Dr Kerr said. If you want a limit, which is a good way of ensuring that the majority of action is taken at home, you should impose one through the bill.

Professor Smith: I agree. I assumed that the aim was to maintain flexibility, to allow other mechanisms to come into play if there was trouble in meeting targets. Such mechanisms are better than nothing, and it would be difficult not to allow any flexibility. However, placing a limit on their use would be beneficial.

The Convener: How much better than nothing are the other mechanisms outside the EU system?

Professor Smith: It depends. There are all sorts of issues to do with leakage and so on. I do not want to say that the other mechanisms are not credible, but we have less control over their credibility. We have much better control over reductions in domestic emissions.

The Convener: Presumably, we would also have to factor in impacts on aspects of sustainable development and the interests of developing countries, as well as our emissions targets.

Professor Smith: Quite so.

Dr Kerr: Yes. If Scotland meets its 80 per cent target in 2050 and sits there grinning at everyone else, but no one else has got halfway there, we will not have achieved anything. There are mechanisms, such as the CDM, that have the potential to support technology transfer and low-emission routes for other countries. However, whether they achieve that is a moot point—some do and some do not. It is difficult to say in the round whether such mechanisms are good or bad; it is a grey area. Some are very good and some are very poor.

Shirley-Anne Somerville: If we set 10 per cent as the maximum reduction from international credits, is there a danger that future Administrations will use that figure instead of seeing it as the ultimate limit, on the basis that it must be okay because it is set in statute? We have seen that happen in other sectors. Are we in danger of giving future Administrations an easy opt-out by setting the limit in statute, rather than basing it on independent advice and allowing flexibility?

Professor Smith: I suppose that one way round that would be to make the cap more stringent as time goes on—as will happen with the annual targets. The cap could be made more stringent each year.

Dr Kerr: Shirley-Anne Somerville made a good point. I have no doubt that once a figure is put in statute it will be used. There might be an argument for leaving things slightly more ambiguous, while ensuring that there will be a credibility gap for the Government if it has to buy credits. That might be a more powerful tool. If the penalty for missing a target is simply a loss of credibility for the Government, an approach whereby a cap on credits is not set but the Government has to go to the Parliament and say, humbly, "We'll have to buy credits to meet our target," might be better. Shirley-Anne Somerville was quite right to suggest that enshrining a figure in statute would force the issue.

Alison McInnes: It is intended to include international aviation and shipping in the Scottish targets. Why are those sectors often singled out as important?

Professor Smith: It is difficult to attribute emissions from those sectors to individual countries. Such emissions have historically accounted for one of the least tractable aspects of negotiations under the United Nations Framework Convention on Climate Change. That is simply to do with the fact that ships sail all round the world and can be owned in one country and registered in another. There are issues to do with bunker fuels in shipping. Aviation raises similar issues, although they are perhaps slightly less intractable. That is the background to the position that we are in, but it does not excuse the position.

Alison McInnes: Will you talk about the sectors' contribution to emissions?

Professor Smith: Globally, the sectors are relatively small, but, as is often pointed out in the media, they are rapidly growing, so it is right to account for them. Whether it is easy to do so is a different matter.

Alison McInnes: The bill does not set targets for emissions from those sectors, but provides that

"The Scottish Ministers may, by order, make provision regarding the emissions of greenhouse gases from international aviation and international shipping that are attributable to Scotland."

Are there inherent weaknesses in such an approach?

Dr Kerr: It is worth flagging up that disaggregated emissions inventories for aviation and shipping came out only last autumn. Disaggregating to constituent countries in the UK is at an early stage.

There is a particular problem with leakage. If we fly to the United States, many of us go via Amsterdam, Heathrow or Paris. Under the inventory, such flights are deemed to be local flights, even though our end destination is the US or Asia. There is an issue about how we account for those types of emissions, and how we get round the problem is not straightforward, given that we do not always know passengers' end destinations. There will always be an issue to do with trying to draw a little circle round Scotland and say, "These emissions are caused by passengers from Scotland." We cannot get round that problem; it is a challenge for us.

Alison McInnes: Should we do nothing until we have solved the problem or should we accept an imperfect system?

Dr Kerr: An imperfect system is far better than no system at all. We should bear it in mind that international aviation will come into the EU emissions trading scheme from 2013. As Pete Smith said, shipping is a real challenge, which we need to find ways of meeting.

Professor Smith: That should probably be done at international level—at UNFCCC level. We cannot take action unilaterally.

Alison McInnes: Will the witnesses elaborate on the impact of Scotland's being the only place so far to set targets that include emissions from international aviation and shipping?

Dr Kerr: The challenge is about what policy levers allow the Scottish Government to reduce emissions from those sectors. International aviation will be tied into the traded sector, so

Scotland will be allocated a certain proportion of the nominal emissions from the UK that are associated with that. Shipping is a real challenge. If that is the sector that is pushing Scotland over a target, what is the Government supposed to do to reduce emissions from that sector? The answer is that there is very little that it can do at present, but it can work with others. It can set in train a series of actions and events to support local shipping around Scotland. There are measures that can be taken in relation to Scottish waters, but one must be aware of the wider context, especially within Europe.

The Convener: Will the witnesses say a little more about the contribution that aviation emissions make to climate change? Beyond the volume of greenhouse gases that are emitted from aviation, a number of different multipliers are used to determine the impact of aviation on the climate and on climate change. Is it safe to say that we know what the correct figure is, or is that still a developing area of the science? Is the IPCC or the UK Committee on Climate Change in the correct position in that regard?

Professor Mitchell: It is not really my area of expertise, but I understand that aviation has tended to include some of the knock-on effects, which has not been the case with other areas of transport. If the committee would like, I could make a written submission on that.

The Convener: That would be very helpful. Thank you.

As there are no more comments on that issue, we will move on. I see that Des McNulty has rejoined us.

Des McNulty (Clydebank and Milngavie) (Lab): I apologise for having to leave the meeting for a period.

I want to ask you about advisory functions and the role of the UK Committee on Climate Change. I am sure that the fact that the chief executive of that body is sitting behind you will not influence your answers.

The Scottish Government proposes to use the UK Committee on Climate Change to provide advice in the first instance, but the bill allows for the establishment of a Scottish body to reflect Scottish conditions, if that is necessary. Is such a body likely to be needed? Should we draw on the best expertise that is available in the UK, or should we look to Scotland-based scientists to provide a Scottish perspective on climate change in Scottish conditions?

Phil Matthews: I think that the position that is set out in the bill is extremely sensible. There is a great deal of expertise on the UK committee, which has just published a good report, but it is useful for Scotland to at least have the option to create a body that is separate from the UK committee if, for any reason, it is thought not to be providing all the information or evidence that is necessary to implement the bill.

Professor Smith: My view is that it is extremely useful to have a critical mass of expertise. If we can ensure that the Committee on Climate Change is able to provide everything that we need in Scotland, it will be the appropriate advisory body. It is early days—the committee has been around for only a year or so—but, if things are done in that way, the more scientific expertise one has, the better.

There are unique conditions in Scotland, and there are provisions in the bill that are relatively unique to Scotland. We will need to ensure that the advice that we receive from the Committee on Climate Change adequately reflects the specific conditions in Scotland. In the first instance, the way to go might be to ensure that the committee has on it people who have some expertise of Scottish conditions in each of the various sectors.

Des McNulty: So rather than establish a separate Scottish body, you suggest that we should go for the biggest mass of expertise but consider how we access it, to ensure that the advice is particularly appropriate for Scottish conditions.

15:15

Professor Smith: Yes. For example, the land use sector might not consider muirburn, but we need to ensure that it is considered when land use, land use change and forestry projections or recommendations are passed to the Scottish Government.

Professor Mitchell: As Pete Smith said, the climate change community is quite small, and we must be careful that we do not dilute the expertise. Apart from that, I do not have a view on the question.

Dr Kerr: It is important to realise that Scotland cannot achieve its targets alone. To achieve them, the United Kingdom, European Union and local authorities all need to work together. It is therefore extremely important to have advice at a UK level, but that could be added to with specific Scottish advice if the Committee on Climate Change does not provide such advice.

Des McNulty: The Scottish Government can ask the UK Committee on Climate Change for advice but, so far, it has not done so formally. Should it ask for advice as we move into detailed consideration of the bill?

Dr Kerr: In the first report of the shadow committee on climate change, the work on

Scotland was fairly cursory, but it tried to cover an awful lot of ground. I think that the Committee on Climate Change will pick up a number of issues from that. The Scottish Government ought to say that, now that the overview report has been delivered, it needs much more detail on specific issues that are associated with the Climate Change (Scotland) Bill and/or other specific Scottish issues. Now is the time to argue for that.

Des McNulty: Is that a shared view?

Professor Smith: Yes. The national inventory is compiled at the UK level, but it is split up into the separate countries. It would be useful to receive advice in a similar way, so that it is specific to the individual devolved Administrations.

Des McNulty: Is the UK Committee on Climate Change sufficiently independent, robust and flexible to maintain the consistency of its advice and strong recommendations in the context of the present policy diversity on energy generation, for example, and fluctuating political balances in future?

Professor Smith: I have no reason to suspect otherwise.

Dr Kerr: It is worth pointing out that the energy market—or at least the electricity market—is a UK market, so even though projections may be devolved or disaggregated to Scotland, they are tied to the wider UK situation. There is no reason to assume that the Committee on Climate Change is not doing its job of considering the Scottish issues, but that needs to be scrutinised, and if the advice is inappropriate, you will need to push harder.

Des McNulty: I can give you an example. The Scottish Government is not of the view that nuclear power has a role to play in future energy generation, whereas the UK Government sees it and renewables as central to its strategy. How can the Committee on Climate Change deal with that different policy context in two separate jurisdictions when it makes recommendations?

Professor Smith: I guess that it will be your job to ensure that the brief for the Committee on Climate Change is clear and to tell it how you need the information. You will need to say that we have a separate policy environment in Scotland and that you want not a devolved, area-based estimate that is derived from the UK estimate but one that takes account of the situation here. If Scotland buys into the UK Committee on Climate Change, you can ask for that.

Professor Mitchell: I guess that the same issue applies to adaptation, in that the changes and issues in Scotland will in some respects be different from those in the rest of the United Kingdom. My understanding is that, for example, the next UK climate impacts programme will deal with the whole of the UK. It is expensive to produce that information, and it is probably more effective to do so corporately than for each bit to try to produce its own. Climate change is very much a global problem.

Des McNulty: The difficulty that I have is that the UK Committee on Climate Change is made up of people with scientific expertise. Although they are sensitive to the policy climate, if they believe that one approach to energy generation is the best approach, arguably they should argue for it and say, "But if, in policy terms, you want to do something different, here are the consequences." It would seem to be sensible not to place the scientists in the difficult position of following the politicians. I am trying to tease out what you think the role of the UK Committee on Climate Change is. Is its role to offer the best evidence—irrespective of policy considerations—and challenge the politicians to come up with their policies on that basis, or is it to devise advice that fits in with policy considerations with which it might not agree?

Phil Matthews: I am wary about saying this when the head of the UK Committee on Climate Change is sitting behind me, but my recollection is that its recently published report said that nuclear is a low-carbon and potentially cost-effective technology, but that Government will have to take on board wider considerations. Such advice will be taken on board by the UK Government and the Scottish Government, and different decisions might be made. The Committee on Climate Change gives scientific advice and lets people take on board the wider consequences of decisions.

The Convener: I will follow up briefly on one aspect. Dr Kerr said that the community of climate expertise is small. Given that commitments are being put into legislation at a Scottish level, that commitments are already in legislation at a UK level, and that, if the international process is successful, a host of other Governments will take on responsibilities, seek to acquire such expertise and put in place arrangements so that they can meet their commitments, are we doing enough, either in Scotland or in the UK, to increase that expertise and grow the knowledge base?

Dr Kerr: I guess that I have a slight conflict of interest, in that the Scottish alliance for geoscience, environment and society, of which I am assistant director, is a big initiative by the Scottish Further and Higher Education Funding Council and 10 different Scottish universities to pool resources and expertise in environmental science to bring some of the best people into Scotland—people such as Professor Simon Tett, a climate scientist whom John Mitchell knows very

well. Having been at the Hadley centre at the Met Office, he is now up at the University of Edinburgh.

About 30 outstanding new people have been brought into Scotland under the initiative. There is a desire within the academic community to bring in the best. There is still work to be done in translating some of the academic work into usable policy evidence. That is, essentially, about a knowledge exchange involving academia, business and policy makers. I suggest that there is still a gap.

The Convener: The ability to attract talent to Scotland is positive, but if the same desire to attract talent increases in other countries, is there a danger that we will face limited supply?

Professor Smith: That is possible. Although the climate change science community in the UK is small, it is world leading, so we are not currently experiencing that problem. We have a small but very healthy community. Many of the research councils' new research programmes, including the living with environmental change programme, which is a cross-Government, cross-research-council initiative, are moving funding in the direction of climate change science. The fact that climate change is recognised not only within society but within the research community as a large and challenging issue will attract more funding into the area. Unlike many areas of the economy, we are in relatively good shape.

Dr Kerr: Because of the very strong leadership that has been shown, people who are into renewable energy engineering and technologies, for example, find Scotland a very attractive place to come to. Also, a lot of work is being carried out on, for example, soils, soil emissions and terrestrial carbon cycles. Strong demand will follow Scotland's genuine leadership.

Professor Mitchell: Over the past 15 years, the number of people in the field has grown enormously. For example, there has been a lot more work in universities, and the good side of that is that it brings diversity. Indeed, the Met Office is just about to sign an agreement with the Natural Environment Research Council on a joint climate research programme. There is a tension between having diversity, which allows new ideas to come forth, and bringing together people in areas where critical mass is required. One of the hopes behind the programme is that the work that is carried out in academia and at the Met Office's Hadley centre will be well distributed to ensure that we cover the gaps and do not tramp on each other's toes or do things twice.

The situation in the UK is becoming healthier. As Dr Kerr made clear, the important point is to build expertise and bring climate science into applications. At this point, I must declare an interest, as the Met Office is trying to use some of its commercial expertise in weather and climate issues to grow that area, which is probably where demand is greatest. Provided that things are well enough organised, climate science is probably okay; indeed, as Professor Smith has said, we are leading in the area.

The Convener: That is helpful. We touched on reporting duties a little earlier, but I believe that there are a couple of follow-up questions.

Shirley-Anne Somerville: We have already heard about the time lag between emissions taking place and reporting on them. How strong are the statistics with regard to margins of error? How are the figures revised over time? Is that an additional problem and, if so, has any work been carried out on it?

Professor Smith: Uncertainties have to be quantified as far as possible, and the UK follows the IPCC's good practice guidance on quantifying uncertainties in national greenhouse gas inventories. Occasionally, however, there might be a methodological breakthrough or we might get a better data set that allows us to go back and make better assessments of our emissions. That is particularly the case in the very messy biological system of land use, land use change and forestry. When that happens, we have to revise the estimates all the way back to the baseline. Of course, that can be tricky for policy makers. The proportion of emissions from the land use sector can fluctuate with every new method of calculation that emerges. Once we are sure that it is the right way to go, we back-calculate the figures, which can change the relative importance of different sectors in the total budget.

As I say, all uncertainties have to be reported as best they can. There are internationally agreed methods of doing that and, as you know, the national inventories are relatively regularly—and quite stringently—inspected and reviewed by independent review panels. The issue, I think, is covered.

Dr Kerr: Professor Smith makes a good point about uncertainties. For example, the baseline between the 2005 and 2006 inventories moved by 4 million tonnes, which is a non-trivial movement—indeed, all the numbers in the 2006 inventory were changed, because they were revised backwards. Such moves cause presentational problems.

The other issue is variability in year-to-year data sets as a result, for example, of more coal burn in power stations or of a colder winter requiring more domestic heating. As I say, between 2005 and 2006, there was a change in CO_2 of about 4 million tonnes, because of an increase in coal burn in Longannet and Cockenzie. That is 7 per cent of the entire inventory and, in setting targets, one

needs to be aware of such variability and try to understand that one year's high figures might mean nothing more than that it was cold that year. I suspect that the Government's report to the Parliament will set all this out but, as I say, one has to be sensitive to the inventory's sheer variability from year to year.

15:30

Shirley-Anne Somerville: Do you think that the Scottish Parliament has enough expertise to assess whether the Scottish Government is delivering on its emissions reduction targets?

The Convener: You can laugh if you want.

Professor Smith: It should not be difficult for the Parliament to assess progress. The targets are transparent and there are inventories to back them up, so we will know what the emissions are and where the targets have been met. It will be challenging to allocate the emissions to different sectors and work out why things have gone wrong—that will be challenging for the science too—but you should receive advice on that from the Committee on Climate Change.

The Convener: Do you have any thoughts on what climate change duties should be imposed on public bodies? The Scottish Government is accepting some duties on ministers, which are explicit in the bill, but it is also taking the power to impose duties on other public bodies in the future. Is that a useful mechanism? What might those duties be? Would there be value in holding other office-holders in the public sector to account for their performance?

Dr Kerr: If you are talking specifically about duties to reduce emissions, the UK carbon reduction commitment will impose reductions on all public bodies that use more than a certain amount of energy, so that will be captured anyway. I presume that you are asking about other duties. Is that correct, or are you thinking about emissions reductions?

The Convener: The bill gives a broad power to impose climate change duties, but it does not specify what those duties would be, and so far the Government has not said whether it intends to use the power. Perhaps the power would be used later if it was felt that the voluntary approach was not up to the mark.

Dr Kerr: I return to the point that was made earlier about providing the required infrastructure and programmes for radical changes in the next few years. The Government may well need to require certain public bodies to do more than they would otherwise do to set the changes in train. In that sense, the provision seems a sensible measure, but it will depend on how it is delivered and used.

To give transport as an example, if we want to install charging points for hybrid cars in every city and town and at every supermarket throughout Scotland, who will pay for that? The Government might need to place a duty on local authorities to enforce the system and ensure that charging points are delivered. That is just an arbitrary example, but such things might not happen without enforcement from the top, which might well be a good place to start.

Phil Matthews: I support the Government's ability to use that power in the future. As Andy Kerr said, the carbon reduction commitment partly addresses the matter, but we should also consider the wider community leadership role that a lot of public bodies have through community planning and so on. There is potential for joined-up local action, which could have the benefits of engaging with local people and encouraging behaviour change.

There are issues about adaptation at the local level, and a duty on that could be placed on public bodies. There is also potential to use mechanisms such as best value to encourage better performance from public bodies in relation to climate change. Some big changes are under way in best value. There are different approaches, but the bill must be flexible enough to allow more direct engagement on the matter between the Government and local authorities and other public bodies.

The Convener: That concludes our questions. Do you want to bring to the committee's attention any points or issues that we did not discuss?

Professor Mitchell: There are a couple of minor matters. First, I mentioned the importance of taking into account adaptation—both to climate variability and to climate change—as well as mitigation. We have talked a lot about mitigation, which is right, but I will give a couple of examples of adaptation. Hydro power and, in particular, wind power are subject to variations in weather. Often when there is a persistent high-pressure system over the country, which in winter brings cold weather and high energy demand, there tends to be little wind. We must plan a certain resilience into renewables, although that is not an argument against using them. For example, some hydro power facilities have small catchments, which tend to dry out first in summer.

Secondly, on muirburn, the Met Office hopes to make a submission, with the Scottish wildfire forum, on how climate change may affect vegetation, the length of the dry season and so on.

The Convener: I am aware that secondary committees are also examining some of the issues

that you have raised. Thank you for taking the time to answer our questions. I remind you that we have set a deadline of 27 February for written evidence, if you wish to raise any other issues in writing. I suspend the meeting briefly to allow for the changeover of witnesses.

15:36

Meeting suspended.

15:43

On resuming—

The Convener: I welcome our second panel of witnesses: David Kennedy, chief executive of the UK Committee on Climate Change; and Katherine White, economic adviser to the committee. Thank you for joining us. Would you like to make some brief introductory comments before we move to questions?

David Kennedy (Committee on Climate Change): No, we are happy to crack on with questions.

The Convener: That is grand. I will start with an easy opener. Will you share with us your initial reflections on the Climate Change (Scotland) Bill?

David Kennedy: Is that an easy opener? As you know, to date we have been very focused on the UK Climate Change Bill. My first reaction to the Scottish bill is that it sets an ambitious long-term target. We have thought a little about the interim target and have some questions about how ambitious that is. We are not saying that it is not ambitious enough, but there is more thinking to be done about it and its implications for what must be done now. I reiterate a point that was made by the previous panel—the next five, 10 and 15 years are key. We must take our lead from what we have to do in the longer term—that has implications for what we do now—but we must act now. We must take opportunities and put in place the necessary policies. If we do not, we will miss the boat on reducing the risk of dangerous climate change.

15:45

Des McNulty: I have been beating on about the idea of short-term action and the fact that if we do not set targets that change the shape of the curve, we will end up not being able to achieve the targets that are set after 2020—which might be irrelevant in the end. Does the bill as drafted provide any—or adequate—reassurances about action in the short term, for example on our contribution to the peaking of climate change internationally?

David Kennedy: The framework is there. You need legally binding targets in the near to medium term, which you have in the bill. You have not said what those targets are, which is probably appropriate, because you have to do more analysis of what needs to be done and what can be done over the next few years.

There are two parts to this. One is the legislation and the numbers that you put in it, such as whether you have a 2 per cent or a 3 per cent annual emissions reduction target or whether you have five-year carbon budgets. Secondly—and possibly more important—there is the strategy that you adopt to deliver the carbon budgets. As a previous speaker said, we have a good track record at UK level of adopting ambitious targets, but a less good track record of meeting those targets. The challenge will be to set the targets, but the bigger challenge will be to come up with the strategies, and to implement them across all the sectors to achieve big social transformation, such as changes in the way that we think about business or corporate culture. That is what is required in the near to medium term. The targets are a starting point—you have the framework for them—but we need action around the targets, too.

Des McNulty: You said that the target for 2050 is ambitious and that it is in line with ambitious targets elsewhere. We do not have a target for 2020. The trajectory to 2020 perhaps does not do all that the environmental organisations are suggesting should be done. Do we need to have a target for 2020? If that target is not a percentage reduction of 3 per cent, what should it be?

David Kennedy: Let me talk you through the thought process that we used to set our carbon budgets. First, we asked what we need to do in 2050. We have said that we need at least an 80 per cent emissions reduction in 2050, relative to 1990. We then asked, what are the implications of that for 2020 and how do we get to 2020? You could take the same steps and swap 2030 for 2020 within your legislative framework. In 2050, you want to achieve an 80 per cent or more reduction in emissions. You would ask how you get to 2030 and see whether that is consistent with your being on the path to 2050. You would then ask what the implications are over the next 10 years for meeting your 2030 target rather than your 2020 target. There is a question about whether your 2030 target is appropriate; I do not know the answer to that, because we have not looked at it in detail.

At UK level, we will do a lot of work over the next year and a half on the appropriate path through the 2020s on the way to 2050. The UK Climate Change Act 2008 requires us to do that in recommending the fourth carbon budget, which we will do at the end of next year. In principle, it is okay to have the 2030 target and draw the implications for the next 10 years. As long as you

have a target for the next 10 years that is legally binding and is on track to what you are trying to achieve in the long term, that is adequate.

Des McNulty: What type of advice can your organisation make available to the Scottish Government to assist it in taking forward this policy agenda?

David Kennedy: Let us take stock of where we have got to. First, we asked what the appropriate target is based on the science and judgments around that science at UK level. You can move from the UK level to the Scotland level in relation to what is appropriate both in 2050 and on the path to 2050 in terms of ambition and contributions to global emissions reduction. We have put out a comprehensive picture of what is achievable in our view across the UK economy as a whole, in the sectors of power and transport, in our buildings, industry and in the non-CO_2-emitting sectors.

We have tried to provide a high-level assessment of what is possible at the level of the devolved Administrations. That assessment is high level—an earlier witness described it as "cursory"—and it is certainly preliminary. We have had to use rules of thumb to go from the UK level to the Scotland level. For example, in considering Scotland's energy efficiency potential, we have simply said that Scotland's share of the total UK energy efficiency potential should be in proportion to Scotland's share of total UK energy consumption. However, that might not be the appropriate way to go when we look at the issue in more detail if Scotland has specific factors—for example, if the building stock here is different—that need to be taken into account.

The next stage of our analysis will be to ask whether those rules of thumb are appropriate. For example, if we have not accounted for the specific factors that face the different national authorities, we will need to ask what we can do to correct that. Going forward—this depends to an extent on resourcing—we hope to build on our preliminary assessment by providing an assessment that is much more tailored to the specific circumstances that face the different national authorities in Scotland and other parts of the UK.

Des McNulty: You heard my question to the previous panel about the different policy context within which you might operate here in Scotland. Is the Committee on Climate Change's role to provide scientific advice irrespective of the policy context, or should that advice to some extent be influenced by, and adapted to, the goals that are set by the politicians? How will you deal with that dilemma in taking things forward?

David Kennedy: I think that we will take things forward in a pragmatic way. First, we are independent, so we will not always take the policy context as a given. Before we published our report, the UK Government's policy position was to proceed with investment in conventional coal-fired generation. Rather than take that as a given, we have said that it might be appropriate to take a different approach. Similarly, on the expansion of Heathrow airport, we have been asked to review UK aviation emissions but we will revisit the Government's policy positions on aviation infrastructure rather than take those as a given.

That said, we are sensitive to the policy context as well. For example, on the question of investment in new nuclear power stations, it might be useful to recap what the Committee on Climate Change has said on power generation. We have said that there are different ways of decarbonising the power sector. One way is to have a portfolio of low-carbon generation assets that includes nuclear power alongside carbon capture and storage for coal and gas, as well as different forms of renewable energy. However, one could decarbonise the power sector without all those technologies in one package. For example, one could do it without CCS, in which case nuclear energy might need to pick up the slack. Alternatively, one could do it without nuclear power, in which case CCS might need to pick up the slack.

I liked the way in which you described the issue previously as a choice between various scenarios. Because of a particular policy position—for example, if people do not want nuclear power because they do not like the safety consequences or the proliferation issues, or the concerns about waste disposal—people might choose a different scenario. The consequences of that choice might be to raise the cost of meeting the given target, but people might choose to pay that extra cost to avoid building nuclear power stations here because they value some things differently from how they are seen in the UK context.

We will take a pragmatic approach that is sensitive to the policy context without taking it as a given. We will work around the policy context and be constructive by showing how the targets can be met in a way that is consistent with people's objectives.

Des McNulty: The next question perhaps builds on that. Can you outline how the Scottish Government currently fits into your developing work plan? How do you expect that contribution or involvement to develop in the future?

David Kennedy: It is fair to say that our work programme for Scotland and the other national authorities is in flux and is up for discussion. In the discussion with the previous witnesses, it was mentioned that no formal request has been made to the Committee on Climate Change. I think that we need a formal request asking us to carry out

work to which we can then respond. Certainly, our intention is to carry on working in this area. We are committed to understanding better what opportunities exist at the level of each of the national authorities. The level of detail to which we take that work is open for discussion.

The issue of resource is involved: the more detail that you require, the more resource we need. We are resourced to take this work to a certain level, but not beyond it. More discussion is needed on the subject. That said, in principle, we are open to giving the committee the kind of advice that is needed in terms of target setting and strategies to meet those targets.

Des McNulty: I am not entirely clear on how the Scottish Government fed into your work plan. Your answer drifted into the issue of resources. Are you saying that you have taken a high-level look at the situation, but that you have not undertaken the detailed work that would have required greater input from the Scottish Government? As things move forward, will it make that greater input into your work?

David Kennedy: We should not understate the level of interaction that we have had thus far. When Adair Turner became the committee chairman, the first thing he did was to come up to Scotland and go to Northern Ireland and Cardiff. He did that as a statement of intent, to send out the message that the committee took seriously its duties under the Climate Change Act 2008 to contribute to an understanding of what is possible at the national level.

Beyond that, we have on-going interaction with officials at various levels of Government. I speak to some officials and Katherine White works with others on a frequent basis. Various groups also shape our thinking; again, Scotland is represented on those groups. In the report that we published in December, we scoped the part that talks about Scotland in consultation with officials in Scotland.

Thus far, we have not received a formal request from the Scottish Government. It has not yet said, "Can you advise us on what carbon targets can be achieved in certain sectors, or give us an overall picture that will tell us what our targets should be over the next 10 years?" In principle, we could do that, albeit that logistical issues would arise as a result.

Katherine White (Committee on Climate Change): Over the past six to eight months, I have worked directly with each of the devolved Administrations in preparing the committee's first report. We held regular videoconference meetings during which we discussed how things were going. The Scottish analysts in particular were supportive of the process. They supplied the information that we required for our analysis. We are at the stage of thinking about what next year's work programme will look like. We are doing work on behalf of the three devolved Administrations to contribute towards the UK progress report and UK budget. We are also in the process of developing the provision of specific advice to each Administration.

Des McNulty: With regard to the bill, the Scottish Government's position is that it will rely on the UK Committee on Climate Change for advice in the first instance, but it reserves the option to establish a separate Scottish committee in due course. What level of resource and which governance and accountability arrangements need to be put in place if the UK Committee on Climate Change is to continue to act as the appropriate resource for advice to the Scottish Government?

David Kennedy: Under the Climate Change Act 2008, appropriate provision was made for governance, the framework for which involves a set of duties that include the duty to respond to requests from Scotland, whatever the issue. The sponsors group is key to shaping our work programme and channelling requests to us. We are holding a sponsors group meeting tomorrow, at which we might discuss the detail of what we can contribute to the emerging agenda in Scotland.

You asked about resource. At the moment, in our work with all the devolved Administrations, Katherine White is our only resource. She is on secondment from Scotland to the committee. Although she has made a valiant effort, I do not expect her to be able to propose appropriate targets and say how Scotland should meet them across all the sectors over the next 10 years. That would be too much for one person to do.

Further discussion will be needed on how to make progress. We will probably need at least one other person on our side; we are not talking about another five or 10 people, but at least another one. That person would work on the analytical and evidence base with all the people whom you have on your side, to make joint progress. I will have to go back and discuss the issue, but I think that our committee would probably have the capacity to scrutinise and discuss issues relevant to the Scottish Government, just as we did on the UK carbon budgets.

16:00

Des McNulty: Scotland has a specific landscape and environment—not just in geographical terms, but in policy terms. Can the way in which your committee is set up take account of our different circumstances?

David Kennedy: The short answer is yes. That will be the next stage of the work.

I will give you another example. We have done high-level UK assessments of changes in land use, of forestry and of agriculture. We suspect that the analysis will be very different at Scotland level, and we would like to look into that in more detail. From an analytical perspective, we are well equipped to do that. We have the collective expertise; we may need more people, but they could tap into a general expertise that we have built up. If evidence were taken to the committee, it would be able to give it a good hearing, understanding the specific conditions in Scotland under the different authorities here, and making appropriate recommendations.

The Convener: Earlier, in discussing whether the UK committee could challenge Government policy, you described the committee as independent. How is that independence guaranteed?

David Kennedy: It is up to us to ensure that we continue to be independent. From what we have already reported on, I think that you can see that we have not been swayed by Government—for example, on the question of investment in coal-fired generation. On the issue of credits, we have suggested that the Government be more restrictive than I think it would like to be. I could give a range of examples.

We report to Government and to Parliament, and what we say is transparent—everybody can see why we are saying what we are saying, and that it is all based on evidence and analysis. That is the foundation of our independence. We are not pulled by the political considerations of the day, and we demonstrate that by backing up our arguments with evidence and analysis.

The Convener: You will be well aware that, in Scotland, we do not always have Governments with a majority or a democratic mandate in the Parliament. Could it be argued that the resources that are made available for an advisory body in Scotland, or for appointments to that advisory body, might be better held by the Parliament than by the Government?

David Kennedy: I have asked myself that question in the context of the UK Government and our funding. The people who decide on my budget are the people whom we are advising, and we might not be advising them in the way that they would want. One solution to that would for Parliament to agree the funding and the appointments each year. At the moment, we could have recourse to a select committee if we felt that issues arose to do with funding and appointments, but such issues have not arisen so far. However, there could be a risk.

The Convener: It is early days.

David Kennedy: Yes.

Rob Gibson: The convener's question may have been relevant at UK level, because there might be a minority Government in London after the next election.

You heard the evidence—Mr McNulty did not, because he did not hear the questions—on fine-tuning the emissions inventory. You have spoken about Scotland's particular land use concerns. In the next year, will you be able to use the inventory? Your first reports contain high-level information, but will it be possible to collect better information for the emissions inventory, as part of our weaponry?

David Kennedy: In respect of non-CO_2 emissions, particularly in land use in agriculture, there is uncertainty about what the emissions actually are. There are rules of thumb, and conventions are used for translating numbers of livestock into emissions, for example, but that may not reflect what happens in practice on individual farms. Ideally, that should be addressed over time, and it is being addressed. We are moving towards using a smart inventory, which DEFRA is developing at the moment. We will have better information.

Does that mean that we should just wait and do nothing in those areas until we have better information? No: it is pretty clear—even on the basis of the information that we currently have—that there are abatement opportunities that we can quantify and take advantage of, although they may change over time. That is not a reason not to proceed, and we can make progress over the next year.

Katherine White: I recognise that the uncertainties that are associated with reporting land use change emissions in Scotland are greater than those for the UK, but the figures are the best that we have for now. There are two ways in which they will be improved over time. The centre for ecology and hydrology, which produces the projections and inventory for land use, land use change and forestry, is constantly improving its approach—that is part of its contract. Also, I am involved in the steering committee for the inventory contract that DECC leads on. The national atmospheric emissions inventory team is reviewing every area of the disaggregated emissions inventory and considering how it could be improved. No doubt, it will identify areas in land use change and other sectors where, as Pete Smith discussed, we could collect more bottom-up, Scottish or relevant devolved Administration data to support a more accurate inventory. We are directly engaged in that, but we recognise that it will take time and more resources if we are to collect annual surveys of different types of data.

David Kennedy: A flexible strategy might be needed. If it becomes clear that emissions

reductions in land use change, forestry or agriculture are not being delivered, they may need to be picked up somewhere else or the level of ambition may need to be changed. That will be a choice in the future. However, the Scottish Parliament's legislative framework will allow such flexibility.

Rob Gibson: That is interesting work in progress that is happening before our eyes. Are you in a position to tell the committee about advice that may have been requested by either the UK Government or other devolved administrations either since the Committee on Climate Change was statutorily established or while it operated in shadow form?

David Kennedy: Can we tell you about work that the Government has requested from us?

Rob Gibson: Yes.

David Kennedy: The Committee on Climate Change existed in shadow form for a year and was established statutorily on 1 December 2008, which is when we reported back on the first set of questions we had been asked. Originally, it was about the carbon budget and the five-year emissions ceilings for the UK. The questions then became, "Should those be carbon or greenhouse gas budgets?", "Should aviation and shipping be included in our long-term target?" and "What should the long-term target be?" We reported on all those on 1 December 2008.

The next thing on which we have to report to the UK Parliament is progress in reducing emissions relative to budgets, in September 2009, although we will not by then have a lot of data. We will have preliminary data on 2008 emissions, but they will not be the basis for a substantial report. We are going to use that report as an opportunity to lay out a set of detailed indicators—a road map or strategy for meeting the carbon budgets that we proposed last December.

Another piece of concrete work that we have been asked to do is to review UK aviation emissions between now and 2050; to provide advice on whether they should, in 2050, be below or at 2005 levels; to consider the implications for emissions in aviation on the path to 2050; and to draw out some of those implications as regards infrastructure—the expansion of airports, new runways and so on.

We were also asked to review the UK framework for low-carbon technology research and development. I think that we are about to agree in principle to do that review. We will be asked next year to review the second-phase cap for the carbon-reduction commitment across the UK. We must also fulfil some statutory duties and report in July 2010 to Parliament, which we must also provide in 2010 with our first report on adaptation and our advice on the appropriate path through the 2020s.

Rob Gibson: Has either of the other devolved Administrations asked you for advice?

David Kennedy: We have worked closely with them, but have not had specific requests. They know that we have a work programme in this area and that we are scoping another—which is where the opportunity to advise you here in Scotland comes from—but they have made no specific requests. I am not sure that the Northern Ireland Assembly will do so, but the National Assembly for Wales might.

Rob Gibson: It is early days. Given that the UK Committee on Climate Change will have a role in reporting on progress towards the Scottish emissions targets, do you monitor the Scottish Government's policy decisions and publication of key documents, such as the national planning framework and the strategic transport projects review? If so, how do you do it?

David Kennedy: Rob Gibson has touched on a sensitive issue for us. When the UK Climate Change Bill was going through the Westminster Parliament, there were many questions about what we would say about policy as opposed to what we would say on appropriate targets and the technical means of meeting them. There is a difference between saying what we can do about our buildings and saying something about the policies that will help to achieve that.

We started by looking at what we need to do and at the opportunities, but we are moving into a space in which we will speak much more about appropriate policies, whether for buildings, supplier obligation or energy performance certificates. For example, we will ask what the appropriate policy is for making people want to buy electric cars rather than conventional cars.

Moving into the policy area is a transition for us. We are aware of the UK policy framework and of the national authorities' frameworks at a high level, but we have not yet looked at them in as much detail as we will. Part of our work programme will therefore be to develop a detailed understanding of the policy framework, and then to make appropriate statements to take it forward.

Rob Gibson: It appears from what you say that you expect the UK Committee on Climate Change to change how it gives advice. Currently, you can give advice, but people can carry out their own policies, whatever you say. However, you expect increasingly to target policies in such a way that it will be more difficult in the future for Governments to dodge them because they will be more focused through having better information.

David Kennedy: We will have our views on what the appropriate policies are, and we intend that they will be based on robust analysis and evidence. If Governments—at UK level or at the level of the national authorities—disagree with us, they will have to say why. That will certainly be the case at UK level. Governments set the rules and are free to disagree with us, but a dialogue would have to happen before they could disregard what we said.

The Convener: You said previously that you can advise not only the Governments but the Parliaments and the Assemblies. Does that apply to requests for advice? For example, would a request for advice from the Transport, Infrastructure and Climate Change Committee be dealt with in the same way as a request from the Scottish ministers?

David Kennedy: Let us be clear: the UK Parliament cannot ask us to do things. We will report to it annually on progress on meeting carbon budgets. I am not sure whether, under the relevant legislation, this committee could make a request to us—I suspect that it could not. I think that such requests must come to the sponsors group from the Scottish Government.

The Convener: That is clear—thank you.

16:15

Shirley-Anne Somerville: You believe that the Scottish Government's 2030 and 2050 emissions reduction targets can be met, but will the requirement to implement 3 per cent year-on-year cuts only from 2020 deliver those targets?

David Kennedy: The best way to answer that question is to approach it from the UK level. We have said that under our intended budgets—which would apply following a global deal and which would make the appropriate and necessary contribution to global emissions reduction—we envisage a 42 per cent emissions reduction by 2020, on the way to an 80 per cent emissions reduction by 2050. Along that path, the annual average percentage emissions reductions are between 2.5 to 3 per cent to 2020 and are above 3 per cent beyond 2020. If we read across from that, the 3 per cent reductions from 2020 that Shirley-Anne Somerville mentioned are probably okay as a minimum. Scotland might well want to do more than that—it will depend on how far it has got by 2020. Up to 2020, Scotland will be looking for reductions of at least 2 per cent, moving towards 3 per cent, to be consistent with the UK as a whole.

Shirley-Anne Somerville: The Climate Change (Scotland) Bill's approach differs from that in the UK act. Do you have a view on setting batches of annual targets rather than carbon budgets? Is one option better than the other or does the choice of approach make no difference?

David Kennedy: We took carbon budgets as a given in the UK context. Our duty was to advise on carbon budgets, not on annual targets. If we were asked to advise on annual targets, we could do so using our analysis and our evidence base, because we have assessed the emissions reduction opportunity in each year to 2020 and we have assessed the appropriate and required international contribution by the UK in each year to 2020.

I can rehearse the arguments that arose as the UK act went through Parliament. That act does not include annual targets because they might not provide adequate flexibility, given the year-on-year changes in emissions because of the weather, for example—emissions rise in a cold winter because people use more heating and we must burn more coal in our power stations. Such factors can mean that reductions go off track from year to year, although they are not off track in the five-year context. That is why the UK went for five-year carbon budgets.

Shirley-Anne Somerville: Another difference is that the Scottish bill does not include the concept of banking and borrowing. Do you have views on the different approach that we are taking?

David Kennedy: Banking and borrowing—particularly borrowing—was felt to be necessary in the UK to allow for events that can happen year on year. If a cold winter occurred at the end of a budget period, borrowing against the next budget might be possible. Banking and borrowing provides flexibility for such events. What can be borrowed is tightly drawn; that is certainly not a get-out-of-jail-free card that allows borrowing to delay the taking of action, which would store risks for the future.

Is it appropriate not to have banking and borrowing in Scotland? If Scotland has year-on-year targets, some flexibility is probably wanted to allow for such events. The committee might want seriously to consider allowing a little borrowing from future years.

Shirley-Anne Somerville: You have said that Scotland has opportunities to reduce emissions by 7 million tonnes of carbon dioxide by 2020. Have you calculated what year-on-year percentage reduction would be required for Scotland to hit your figure?

Katherine White: No. That figure is the sum in 2020 of the sector-specific abatement opportunities that we identified for Scotland—it means 7 million tonnes of abatement in 2020 versus the projected emissions without those measures. We have not yet examined how that would evolve over time, nor have we examined the

annual savings in Scotland, which would enable us to say what percentage reduction would need to be achieved.

David Kennedy: We can do the calculation for you—not today but with a short turnaround. It would not be difficult to compare reduced emissions levels with current levels and to come up with an annual percentage reduction.

Shirley-Anne Somerville: Am I right in saying that the figure for abatement potential for each nation was not arrived at through a bottom-up analysis of policies and might be subject to change?

David Kennedy: Yes. That is the next stage of the work. The preliminary assessment does not reflect specific circumstances in Scotland. That is something that we need to bottom out. We have said clearly in our report that the figure would not be an appropriate basis for target setting, because further work is needed to tailor it to the specific situation in Scotland. We envisage that work being done during the next year, which will lead up to the inclusion of your targets in legislation in about a year and a half.

Alex Johnstone: It is interesting that you think that there is the potential to reduce CO_2 emissions in Scotland by 7 million tonnes by 2020. Have you done the calculations for any of the other five key gases?

Katherine White: Alex Johnstone quoted the CO_2 equivalent figure, which includes savings associated with methane, nitrous oxide and fluorinated gases.

Alex Johnstone: If that is the case, in which key area can the best savings be made in Scotland?

Katherine White: The abatement potential that we identified, which I stress is an initial assessment—as David Kennedy said—does not cover all areas of the Scottish economy. We focused on emissions savings through energy efficiency in buildings and industry as well as on savings in the road transport, agriculture and waste sectors. We did not cover the power sector, for example.

There is significant potential in energy efficiency in the residential sector. If I remember rightly, about 3 million tonnes of the 7 million tonnes of savings would come from the residential sector. Energy efficiency is a key area of potential in Scotland. However, we did not take into account the state of the housing stock in Scotland, which is different from the UK average on which the analysis was based. We have done an initial assessment, but we would have to take into account that there are more off-grid homes in Scotland and that different types of wall structure might mean that it is not possible to insulate walls as cost effectively as we assumed it would be in the assessment. Although we identified considerable abatement opportunity, I cannot say that there is an accurate assessment for Scotland.

David Kennedy: Let us not underplay the assessment too much. We keep saying that it is an initial assessment: although the numbers might change a little as we take account of specific circumstances, the message will not change. The message is that there are opportunities in all sectors in Scotland, none of which should be neglected. Scotland's strategy should cover residential and non-residential buildings, transport, agriculture, waste and the power sector.

Alex Johnstone: In statistical terms, would you say that potential savings are about 7 million tonnes?

Katherine White: Yes. I cannot give the range, but we expect the figure to be in that ball park.

Alex Johnstone: Is the information that is available on international aviation and shipping robust enough to be included in Scottish targets at this stage?

David Kennedy: I would differentiate between aviation and shipping. We have considered the issues in great depth and we have been troubled over whether aviation and shipping should be included in the UK carbon budgets. We recommended that they should be in the long-term target but not in the budget, because of complexities to do with measuring and allocating emissions. There are methodologies that we are comfortable with for allocating aviation emissions to the UK from international flights. Bunker fuels data comprise one of those. We could have gone either way on recommending whether or not aviation should be included in the carbon budget.

Somebody asked a question earlier about radiative forcing. That issue needs to be bottomed out—there is no consensus on the appropriate solution. We have used a radiative forcing factor of 1, as is the convention—that number is used for the inclusion of aviation under the EU ETS. Everybody agrees that 1 is not the number that we would choose, however; it is at the very left-hand side of the distribution of numbers that we could possibly use, and its use is the result of political negotiation. That number will probably have to change in the future. We will examine further whether it should be 2, 3 or 4, in the context of the aviation emissions review.

Aside from radiative forcing, we think that it is possible to allocate aviation emissions at least to the UK level; we will need to look into the complexities of going to the Scotland level. I believe that you will be asking us about that as part of your wider requests in the future.

Shipping is slightly different. We were not satisfied that we could get a handle on the UK share of international shipping emissions. If we think about a ship that has come from east Asia and has stopped at 15 places on the way here, unloading and loading different cargos and fuelling up at different places, it is not clear what the UK's share of that vessel's emissions will be. Although we have methodologies to apportion emissions, we were not comfortable that they actually represent our share of shipping emissions. That led us to conclude that we cannot tackle shipping emissions at national level, and that the only way to tackle it is at global level, with global agreement. With that in mind, we are watching what the International Maritime Organization proposes to the United Nations Framework Convention on Climate Change by way of a global agreement later this year. That will be the key as far as shipping is concerned. It is difficult, however, to arrive at a meaningful number for shipping at the national level.

Alex Johnstone: We heard earlier that the UK act is likely to apply a limit on international credits, based on your advice. The Climate Change (Scotland) Bill does not contain a similar power for the Scottish Government. What is your view on that difference?

David Kennedy: I will quickly take you through why we said what we did about credits. We started off at 2050. We do not envisage that there will be a lot of use of credits in 2050 because all the countries of the world will have ambitious targets that they will have to meet under a global agreement. Nobody will be selling. The implication is that we must have an 80 per cent reduction domestically—or largely domestically—by 2050. As we move forward in time, we must start preparing for that. We cannot buy credits right up until 2050 and suddenly have an 80 per cent cut domestically; we must do things domestically on the way to 2050 to meet the 80 per cent target through domestic action. We were aware of concerns around the certainty of credits, which are calculated against the baseline—rather than a cap—but that was not why we said that we should limit the use of credits; rather, it was because we need to be on track in taking action domestically for 2050.

We should certainly meet our interim budget through domestic action alone—that is the 34 per cent cut. Then, we could buy credits to go from 34 to 42 per cent in 2020. The UK act, as you have said, requires the Government to consult the Committee on Climate Change on the appropriate use of credits and to legislate five years ahead. The use of credits will be discussed only for the first budget period. In March or April, the Government will say what legislation it will introduce on carbon budgets.

We expect the Government to follow our advice and to allow the use of credits under the legislation, but to choose not to, in order to meet the interim carbon budgets. Beyond that, when there is a global deal, we will be comfortable about buying in, for instance, 10 to 15 million tonnes of CO_2 emissions reduction a year. In the Scottish framework, you do not have the flexibility to buy in 10 or 15 million tonnes of CO_2 a year. Within your framework, I would approach carbon budgets by asking what is achievable in the non-traded sector—buildings, transport and so on. That would form the basis of the targets in Scottish legislation—unless you decide that you, too, wish to buy credits as a means to meeting targets. I am not sure, however, whether that would be consistent with the Climate Change (Scotland) Bill.

The Convener: You mentioned that you were doing some further work on radiative forcing. Are you able to say when that is likely to be completed?

16:30

David Kennedy: We have to report back on aviation emissions in the UK as a whole in December this year. It is not specified when in December, but we are working towards the end of November for a 1 December delivery. We will examine a range of matters, including the role of carbon prices in aviation, possible efficiency improvements, the role of infrastructure investment, radiative forcing and what forcing factor is appropriate. I imagine that we will say that 1 is not is an appropriate forcing factor to use, but it is difficult for the UK to change to a different forcing factor. Unless other countries also change, there is not much point in doing it. However, let us not pre-empt what we will find.

The Convener: A couple of committee members asked the previous panel of witnesses about whether the current economic situation makes a reduction in short-term emissions over the next year or two likely. There will obviously be a time lag before we find out whether it has happened, but is it a reasonable expectation? If it is, should that make it possible for us to set a more ambitious trajectory in the ranges for annual targets that are specified in the bill?

David Kennedy: I cannot give you a definitive answer to that, but it will be part of our work programme at UK level over the next few months. We want our report to Parliament to include a chapter about the macro context and its implications for meeting carbon budgets.

There are two countervailing forces. As economic activity falls and gross domestic product drops, energy consumption goes down and emissions go down with it. On the other hand,

fossil fuel prices have fallen as part of the global economic situation and, as they fall, we consume more energy. We will have to watch how those two forces balance out. We will analyse that using our energy models and come to a view on it.

I agree that, if emissions were to go down because of the macro situation, you should reflect that in your targets and make them more ambitious than they otherwise would be. You should not use the economic downturn to say that you have been successful in reducing emissions and do not need to take other measures on buildings and transport. That is a risk, but we will give a clear message in the UK context that, although the budgets that we will have in legislation may have been based on a different macro context, we should attempt to outperform them because the macro situation has helped to drive emissions down.

Alison McInnes: Will you outline the reporting requirements that result for you from the Climate Change Act 2008?

David Kennedy: The primary requirement is that we must report annually to Parliament on progress in meeting carbon budgets. The way that we interpret that requirement is that we will make a detailed assessment. We will not simply say what the trajectory for emissions is under the budgets, what emissions are doing and what the difference is and leave it at that. In our report to Parliament this year, we will publish a set of leading indicators against which we will judge future progress. We will have indicators for the number of buildings that should have been insulated, the number of hybrid cars that we should have in the mix at a certain point in time, and the number of gigawatts of renewable electricity capacity that we should have on the system, as well as targets for emissions in particular years. We will use that framework to report annually to Parliament. The first annual report after September this year will be in July 2010 and we have to report each year after that.

Alison McInnes: Will the Scottish Parliament have sufficient expertise to assess whether the Scottish Government is achieving emissions reduction targets? How might we improve that?

David Kennedy: I do not know enough about what expertise the Scottish Parliament has to be able to have a view on that. It will depend on whether the Parliament is presented with a robust analysis upon which it can make a judgment. One does not need to be a specialist scientist to read a decent progress report, so I guess that it will come down to the quality of the report that is presented to the Parliament.

The Convener: My final question concerns the part of the bill that creates the power for the Scottish ministers to introduce secondary legislation to impose climate change duties on other public bodies. Do you have any thoughts on what the role of those duties might be and what kind of duties would be applied? Would there be value in acting on that power early rather than tucking it away and thinking about using it in a few years?

David Kennedy: The main lever for reducing emissions in the public sector is the carbon reduction commitment, which provides a significant opportunity across public sector bodies. If the cap in that is set correctly, it will provide incentives to get emissions down and manage energy efficiently. It is not immediately obvious to me that there is a need to go beyond that, but there may be scope for the Government and public bodies to do something on green procurement. Certainly, many of our stakeholders perceive that the Government must be seen to act as it tells everybody else to act. Green procurement is a highly effective lever in that, so there may be an opportunity to do something on that over and above the carbon reduction commitment.

The Convener: That would mean requiring public bodies to do what they have been permitted to do so far: to take sustainable development into account in procurement.

David Kennedy: Yes, it would mean strengthening the incentives and requirements on green procurement, although I am not in a position to say exactly what that would achieve. As I have said, there is a lot in our work programme this year. The Committee on Climate Change has existed for only a year and there was a limit to what we could do in the past year. However, green procurement will be important for us in the future and we want to come to a view on whether it will be a big issue. I suspect that, regardless of whether it results in big emissions reductions, the signal that it gives will be important as part of leadership from Government on the climate change strategy.

The Convener: The committee has no further questions. Do you want to bring to our attention any other issues that have not been covered?

David Kennedy: We have covered the range of issues that came up in the report and signalled our intention and willingness to work with you in the future. We need to take that debate forward, but we can do so offline; we do not need to do it today.

The Convener: We look forward to that. I thank you both for the time that you gave to answer questions. That concludes the meeting.

Meeting closed at 16:37.

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