OFFICIAL REPORT
AITHISG OIFIGEIL

DRAFT

Net Zero, Energy and Transport Committee

Tuesday 16 December 2025

Session 6

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NET ZERO, ENERGY AND TRANSPORT COMMITTEE
38th Meeting 2025, Session 6

CONVENER

*Edward Mountain (Highlands and Islands) (Con)

DEPUTY CONVENER

*Michael Matheson (Falkirk West) (SNP)

COMMITTEE MEMBERS

*Bob Doris (Glasgow Maryhill and Springburn) (SNP)
*Monica Lennon (Central Scotland) (Lab)
*Douglas Lumsden (North East Scotland) (Con)
*Mark Ruskell (Mid Scotland and Fife) (Green)
*Kevin Stewart (Aberdeen Central) (SNP)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Professor Jillian Anable (University of Leeds)
Professor Kevin Anderson (Tyndall Centre for Climate Change Research)
Lloyd Austin (Stop Climate Chaos Scotland)
Jarrod Birch (ChargeUK)
Professor James Curran (Climate Emergency Response Group)
Philip Gomm (RAC Foundation)
Jess Pepper (Climate Café)
Andy Poole (Society of Motor Manufacturers and Traders)
Dr Mark Winskel (University of Edinburgh)

CLERK TO THE COMMITTEE

Peter McGrath

LOCATION

The Mary Fairfax Somerville Room (CR2)

Scottish Parliament

Net Zero, Energy and Transport Committee

Tuesday 16 December 2025

[The Convener opened the meeting at 08:30]

Decision on Taking Business in Private

The Convener (Edward Mountain): Good morning, and welcome to the 38th meeting in 2025 of the Net Zero, Energy and Transport Committee. Our first item of business is a decision on taking items 2, 3 and 5 in private. Item 2 is consideration of the evidence that we heard last week on the Biodiversity Beyond National Jurisdiction Bill legislative consent memorandum, item 3 is consideration of the committee's work programme and item 5 is consideration of the evidence that we will have heard on the draft climate change plan. Do we agree to take those items in private?

Members *indicated agreement.*

The Convener: We will move into private for about half an hour before we hear from the first panel of witnesses.

08:31

Meeting continued in private.

09:02

Meeting continued in public.

Draft Climate Change Plan

The Convener: Welcome back. Our fourth item of business is an evidence session on the Scottish Government's draft climate change plan, which sets out how the Government intends to meet its carbon reduction targets. The committee is leading a cross-committee effort to scrutinise the draft plan, and the Scottish Government has said that it will lay the final plan by the end of March. Everyone who gives evidence today will be contributing to a report that we will publish in, I hope, late February, with a debate in the chamber to follow.

I welcome to the meeting Lloyd Austin, policy adviser for Stop Climate Chaos Scotland; Professor James Curran, a member of the Climate Emergency Response Group; Dr Mark Winskel, a senior lecturer at the University of Edinburgh; Jess Pepper, the founder and director of Climate Café; and Professor Kevin Anderson, a professor of energy and climate change at the Tyndall Centre for Climate Change Research. I thank all the witnesses for attending the meeting.

This evidence session is intended to provide an overview of the whole draft climate change plan, without a focus on any specific policy. We will go straight to questions. As convener, I get to ask the first question, which is always an easy one—the warmer into the bank, as it were—to allow you to express your views. Given that there are five witnesses, it will not be possible for everyone to answer every question that is asked. To help me, if you agree with something that somebody said earlier, you do not have to repeat it. It would be great if you could just say that you agree or that you do not agree and then say why, because that will save a bit of time. We have about two hours for this evidence session.

It is seven years since we had a full climate change plan, and it is five years since the climate change plan update. A lot of countries, including Scotland, have adopted an ambition for net zero emissions, with the intention of achieving the Paris agreement targets on temperature increase. In your view—you will all get a chance to answer this question—what are the key things that have changed?

I will bring in Lloyd Austin first.

Lloyd Austin (Stop Climate Chaos Scotland): Thank you for the opportunity to talk to the committee. The main thing that has changed is probably the passage of time. Some of the policies and proposals in the previous climate change plan

and its update have been implemented, but some have not, which has been a significant problem. In recent years, we have changed from annual targets to the new five-year carbon budget system. That was, in part, due to a series of missed targets and advice from the Climate Change Committee that it would be difficult to meet the 2030 target.

Despite the progress in reducing emissions compared with the 1990 baseline—there has been about a 50 per cent reduction so far, which is good progress—we must recognise that we have picked the low-hanging fruit and that, in the second half of reducing emissions to net zero, we have some difficult choices to make. It is important that we make those difficult choices, and I am not quite sure that those choices are made in the draft climate change plan in order to deliver what is needed.

Nevertheless, it is welcome that there is a draft plan. It was delayed by the process of switching from annual targets to five-year budgets, but we are here now. We have a plan and it is welcome that there are scrutiny and consultation processes. One hopes that that will deliver a stronger and better final version of the plan before the election, although that will be difficult, given the timeline for taking into account all the impacts and all the information that will be gathered through the scrutiny and consultation processes.

The Convener: I will ask the other witnesses to reflect on the point that you have made. Those with memories of this Parliament will know that, just before the previous election, a climate change plan was produced that included some headline-grabbing targets, but those targets proved to be unachievable. We are now in a similar situation in that we will be considering the draft climate change plan in the dying days of this session of Parliament, just before dissolution and the election. We could have been considering it in 2023, but the Government decided to delay its publication.

James Curran, when you are reflecting on what has changed, could you say whether you are concerned about where we are at? I am certainly concerned.

Professor James Curran (Climate Emergency Response Group): I thank the committee for inviting me along. What has changed? Yes, I am very concerned because, at the global scale, climate change seems to be accelerating. We are already above a 1.5°C increase, and some work that I have done is beginning to show that global natural sequestration of the terrestrial biosphere is beginning to fail—a lot of the mechanisms that we hoped would increasingly save us from the repercussions of climate change are showing signs of failing. That is a very significant concern at the technical end of climate science.

In relation to Scotland's role, I have been involved in work on climate change from the earliest days, since 1990. I was always very proud of Scotland taking a genuine world leadership role, but I think that we are beginning to lose that, which is a pity.

I agree entirely with Lloyd Austin that we have done a lot of the easy stuff and that we now need to do the much more difficult stuff, which involves much wider stakeholders and will have a greater impact on the wider population. That makes things a little bit harder, and it is why new versions of the climate change plan need to include thorough governance and delivery mechanisms, because it is no longer quite as simple as it used to be. However, I do not see such mechanisms in the draft plan.

Dr Mark Winskel (University of Edinburgh): I thank the committee for inviting me. I imagine that I am here as a representative of the UK Energy Research Centre—I am a deputy director—but I am speaking as an individual today, not on behalf of the centre. We are developing a written proposal for the Government, but we have not finalised that. We hope to talk to the Government early next year. We have not been involved in the development of the draft plan.

An awful lot has changed in the energy world. There have been huge changes since the previous plan. I gave evidence in, I think, 2017, and the energy world has been transformed in that time. In many ways, politically and economically, there are stronger headwinds regarding the development of climate policy. Some of them have been referred to already. The evidence on tackling climate change as a public priority has changed a bit—it is not as much of a priority for large parts of the public as it was certainly in 2019, when I remember giving evidence to a different committee. Therefore, the challenge is more acute in some ways.

It is also important to say that some things are looking much more encouraging. The cost of renewables technologies has come down dramatically in that period. At breakfast this morning, I was looking at the Scottish Fiscal Commission's revisions in its report. It has updated its estimates on the costs to Scotland based on the difference between the advice in the Climate Change Committee's sixth carbon budget and that in its seventh carbon budget. There have been dramatic cost reductions, so, in many ways, the pathway is cheaper, particularly for renewables and electricity. Therefore, there have been some good enablers of change in that period, too.

I will leave my comments on the draft plan until later, because I do not think that you were asking about that, were you?

The Convener: No, but I am interested in whether you have fears, given that you gave evidence in 2017 and since then, that we are in the last three months of this parliamentary session, having had a little break for Christmas, and are still trying to find our way through the plan. Does that concern you?

Dr Winskel: Of course it does. I have been to one or two stakeholder workshops on the subject, and that is a widespread concern. It is obviously a concern. The position is far from ideal. A lot of people are putting quite a bit of effort into responding to the Government's consultation and to the Parliament's questions. We submitted a response to the committee's earlier call for evidence. Given that the timeline is so tight, there is an obvious concern about how different the final plan will look from the draft.

The Convener: I think that we will have a month, once the consultation has finished, to find out.

Jess Pepper (Climate Café): I agree. I will try not to cover the same ground. However, I want to acknowledge that we are in a climate and nature emergency and that the impacts—and the devastation that they cause—are accelerating. We are seeing that here in Scotland—they are impacting our lives and livelihoods across the board—and internationally. We are in touch with our Climate Café colleagues in Indonesia, who have told us about the utter devastation there recently.

It is important to remember that this is not just any plan, but our climate change plan, and that Scotland has been acknowledged globally as a leader in this area. Therefore, it is important not only that we do this for Scotland but that we set an international example.

09:15

The shift in the framework in Scotland has been referred to. The other thing that is shifting in society is the growing concern, anticipation and interest in the climate change plan. People are raising their voices. We are inundated with inquiries from people who are creating spaces, and providing support for those spaces, in which to talk and understand what they can do and how they can be involved in action. They also want to know that we have got this and that we know what we are doing as a nation.

On where we are at now and lessons learned from the previous plan, last time there was a sense that the process of development had been quite narrow, and that came across in some of the committee's questioning at the time. Not an awful lot of evidence was provided of broad stakeholder engagement and participation in the development of the plan. In contrast, the parliamentary scrutiny process was really broad, open, inclusive and participative, involving several committees, as it does now. It also involved all sectors. For example, there was a round-table discussion where all sectors got into more of the nuanced detail about what each sector could contribute, which was over and above the advice that the CCC had provided. That allowed everybody to hear what was possible, the resources that might be needed, where there might be connections and collaborations, and what people could do based on their experience.

A huge raft of recommendations were made, but, unfortunately, there just was not the time to pick those up and integrate them properly into the plan. That was a missed opportunity. We probably could have got an awful lot closer to the ambitions that were set out at the time, had all those sectoral voices, and others, been heard and taken into account. This will take all of us. We must have the clarity of a strong, robust plan that has been developed broadly. That will lead to ownership and delivery.

One of our concerns is that there is not an awful lot of time to get things into the plan. I am intending to mention things today that could, I hope, improve it, but how are people to be involved—not just at this time of year but over the time that we have left? I know that we will go into more detail on this, but who will be left out? We know where there will be opportunities for engagement and input into the plan, but those who will be left out is quite an important issue. Often that will be people who are leading on climate action in their own communities and across regions. They are the ones who have the local knowledge and understanding of what solutions are possible and what they are doing themselves. The worry is that that will not get heard and be included in the final plan.

The Convener: Thank you. I will bring in Kevin Anderson.

Professor Kevin Anderson (Tyndall Centre for Climate Change Research): Since the Paris agreement, we have emitted globally just over one third of a trillion tonnes of carbon dioxide into the atmosphere. Therefore, the carbon budgets have reduced by that huge quantity since then.

As James Curran points out, we have an improved understanding of the science, including on the issues of aerosols and on some of the other feedbacks. When we now look at the carbon budgets that are available for global warming of 1.5°C and 2°C, they are smaller than we thought

that they would be. They are smaller because we have squandered our opportunity by putting lots more emissions into the atmosphere.

We are now almost at 1.5°C. Globally, we could probably emit 130 billion tonnes of CO_2. That is three years of current emissions. To stay at 1.5°C globally, we need to reduce emissions by between 20 and 25 per cent per annum. In other words, that is not achievable. For the much riskier 2°C, we could probably emit around 500 billion to 600 billion tonnes of CO_2. That would require an 8 per cent reduction every year.

There is on-going failure at the global and national levels. There are no leaders on climate change. No nation is showing progress. When you add all that together, we are in a much more serious situation than we were than at Paris or at the time of the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.

This sounds harsh, but I slightly disagree with Mark Winskel in the way that he framed his response by saying that there was some positive news. We must remind ourselves that the climate does not care about renewables or efficiency. It cares only about CO_2 and other greenhouse gas molecules. Unless we eliminate the use of fossil fuels and dramatically cut emissions from agriculture, the temperature will simply keep rising. Reducing the amount of fossil fuels still means that the temperature rises. We have to stop using them, and then, very slowly, the temperature will stabilise and start to come down.

All that we have done so far at the global level is reduce the size of the steps we are taking backwards, because it is a cumulative problem. A much more honest reflection is that we are not making progress; we are only going backwards. Even the small steps that we think are moving us forward are not—they are just smaller steps backward than they might otherwise be.

The other thing that has changed significantly is that we understand some of the impacts. Take the Atlantic meridional overturning circulation or AMOC. Changes to that could have dire implications for Europe, especially for Scotland. Scotland would be more in line with Labrador. In the winter, it would be more like -15°C. If you consider that in terms of the housing quality in Scotland, people would be dying in their houses.

If you go back around 10 years, people did not think that there was a high chance of AMOC—the gulf stream is part of that, which is the language more commonly used—reversing or stopping. Now, there is a significant risk of that occurring and there are no plans in Scotland, the United Kingdom or the rest of Europe to deal with what the implications of that would be.

On the legal side, we now have bodies such as the International Court of Justice giving their advice on 1.5°C. Without going into any details, I know that there are cases to take other countries to court for their production and on-going sales of fossil fuels.

We have a whole suite of things there. The science is basically telling us that we are going to hell in a handcart very quickly. Emissions are still increasing—they are not decreasing. Even in countries such as Scotland, the UK or the rest of continental Europe, we are just playing with emissions, which are dropping by the odd per cent or two every so often. We also have a legal framework that says that we must stick to 1.5°C, which we have virtually gone past.

I am sorry to say that, in 2025, there is no good news. There is less bad news, and we can polish that if we want to—or we can just stare directly at the challenge that we face and say, “What do we need to do to respond to a climate emergency?” The Scottish Parliament declared a climate emergency in 2019. The draft climate change plan before us is not an emergency plan. At the moment, Scotland, like every other country, is polishing failure.

The Convener: Right, okay. That is quite stark—I am sure that committee members will pick up on that as we go through the session. I noticed that some of the witnesses were nodding when you were making those comments. It will be up to them to build on them.

The next questions are from Mark Ruskell.

Mark Ruskell (Mid Scotland and Fife) (Green): I am struck by what Kevin Anderson said. There is very much a consensus between the UK Climate Change Committee and Governments across the UK on the need for a balanced pathway, and, from what we can see, the draft plan reflects the need for such a pathway. The issue is to do with the art of what is politically possible in the current context. Does the plan reflect the emergency that we are in? Obviously, we take the advice of the UKCCC, and we are following the middle path, but is that okay? Should we be sticking to the goal of reaching net zero by 2045? Does the plan reflect the urgency of what is required?

I turn first to James Curran.

Professor Curran: I will respond initially, but I am sure that all the other witnesses will want to respond, too.

In summary, I agree with everything that Kevin Anderson said. It is that scary. I referred earlier to what that means to me and to the Climate Emergency Response Group that I am here to represent. The predominant failure in the current

draft plan—I believe that the committee has had a lot of submissions on this issue already—is to do with the extent to which any delivery mechanism is evident in it.

We all welcome the plan and its ambition of reaching net zero by 2045. Many of the elements for getting to that point are there in the plan, but there seems to be a void when it comes to the pathway for delivering on all those commitments. It is the delay in delivery that is happening globally, which Kevin Anderson referred to, that is worsening and tightening the screw on the crisis. The figures that he mentioned on how rapidly we now need to decarbonise are overwhelmingly hard to meet. If we mean anything when we talk about an emergency, we should be putting every effort into treating it as an emergency and doing something about it.

Very recently, in September 2025, the Climate Emergency Response Group issued a very useful report entitled "Embedding delivery in Scotland's Climate Change Plan: Improving Design, Governance, and Implementation". It might have been shared with you; it is certainly available on the website. It lists eight questions that should be asked of the plan, all of which relate to aspects of delivery. On every one of those questions, I think that the answer would be, "No, it's not there."

If I may, I will indulge myself for a moment. I will try to be brief, because I know that others will want to come in. More than 10 years ago, when I was working for the Scottish Environment Protection Agency, I was named as the person responsible for delivering the Flood Risk Management (Scotland) Act 2009. The task of operationalising that act, which is huge and highly technical, was landed on me as the named individual, which was quite scary. It seems to me that there are many analogies between how that was delivered and how a climate change plan needs to be delivered. It involved all 32 local authorities, the two national parks, Scottish Water, NatureScot, SEPA, the Met Office, various consultancies, the Scottish Government and many local community groups. Flooding is a highly political issue, both in local authority politics and national politics. All the elements were there to make that a really hard task. It had to be delivered to a very tight deadline or else the European Commission would have imposed heavy fines.

I followed the path of a very robust, professionally managed system. At one point, I had about 100 of my staff in SEPA working on it. There were probably several hundred people across Scotland in the various other organisations who were working on it, and it was held together by four professional programme and project managers who managed the whole system. They worked out the pathways, from the intention to the deliverables. They looked at the milestones, the interdependencies and the risks, and they assessed the true deliverables. Throughout the process, they carried out monitoring and evaluation, and they reported back to the programme board, which I chaired.

I see every parallel between that task and the task of implementing the climate change plan. It was delivered within budget and within time, and I see no reason why the same approach cannot be applied to the climate change plan—indeed, the same approach must be applied to the climate change plan if we mean to deliver it and to contribute to addressing the emergency.

Mark Ruskell: We can come back to delivery and governance. Do others have any quick thoughts in response to my initial question? I think that Jess Pepper wanted to come in.

Jess Pepper: We need to hear the sirens. To add to the points that have already been made, the climate change plan needs to be a really robust plan. If we are to acknowledge the scale of the emergency and the scale of what we have to achieve here, everybody needs to muck in. We need to bring everybody together, because we all need to have ownership of the plan.

We can talk more about how we will get there. At the moment, the plan does not scream about that process, although there might be more to come through the consultation. As James Curran said, there are certain things that it is reasonable to expect in this plan in particular, such as the specific steps for how we will achieve things, the timelines, the milestones, who will be leading and what roles and responsibilities people will have.

09:30

The climate cafés have not had long to look at the plan; some of them will look at it this month and some will look at it in January. The community-led cafés tend to meet monthly, so they have to fit consideration of the plan into their gatherings. The feedback that I have had from them is that they are finding it a challenge to read across the plan, to understand how the different aspects relate to one another and to respond to the questions that are being asked, because it is not easy for them to navigate. It is necessary to dig into it and untangle it a bit. There is a need for robust clarity and for folk to be involved. If more information was visible to enable us to understand who has been involved in the development of the plan—it might the case that it is there, but we simply cannot see it—we might get a better sense of how it has come together.

Civic society has been having such conversations since the big climate conversation in summer 2019—I do not know whether you

remember that. Communities participated actively in that, but we have not heard what happened to all the ideas, actions and solutions that they provided. We do not know what happened to those things. More than 1,000 specific actions were suggested through the climate emergency summits. I was involved in a collective that developed that series of summits with the Royal Scottish Geographical Society. It brought together leaders in business, communities and expertise from all sectors. It was a case of throwing the gates wide open and asking, "What can we all do to get the best suite of options here?"

The Stop Climate Chaos coalition has produced its policy proposals, which are deep and detailed, as has the Climate Emergency Response Group. There are also the contributions from Scotland's climate assembly, including the children's contributions, as well as the recommendations from the people's panel and from Audit Scotland and those that were made following the scrutiny of the most recent climate change plan. All those things are out there, but it is difficult to understand how they have been taken on board or whether they have been thought through. As far as we are aware, there is no follow-up dialogue. Maybe there is, but that is not clear from the supporting papers.

Mark Ruskell: [*Inaudible*.]—more ambition if those ideas are brought in.

Jess Pepper: I am sorry—I missed the first part of what you said.

Mark Ruskell: From your perspective, there is room for more ambition if those ideas are brought in, but it is not clear that they have been.

Jess Pepper: Yes. We are not starting from scratch.

Mark Ruskell: I am aware of the time. I would like to hear briefly from Mark Winskel, Lloyd Austin and Kevin Anderson.

Dr Winskel: I think that we are talking about different things here. Comments have been made about the adequacy of the plan, and I share many of the concerns about the way in which the plan has been presented and the fact that the evidence trail is not really there when it comes to the connection between the analysis, the policy costs, the overall policy package and the effort across different sectors. I do not know whether the committee wants to talk about that in a lot of detail, but concerns have been expressed about those things in other committee meetings.

I differ a bit when it comes to the overall pace of delivery. The Climate Change Committee does not work in the realm of what is politically possible, which you referred to in the introduction to your question. The Climate Change Committee works on the basis of the best evidence base that it can assemble, which includes commissioned work, academic reviews, in-house analysis, consultancy modelling and so on, and it then recommends pathways for delivering. It has recommended the carbon budgets, which the Government has largely accepted. The overall budget envelopes have been accepted by the Government, and the committee has said that the interim budgets to 2040 and net zero by 2045 are feasible and deliverable. Those are considered feasible against all kinds of criteria. The committee looks at all kinds of things, including economic criteria, supply chain development, pace of change and public acceptability.

On the issue of going faster, Kevin Anderson is absolutely right in what he said about the climate science and the lack of international progress since the Paris agreement, but Scotland has a job to deliver net zero by 2045. The climate change plan update set an interim target of a 75 per cent reduction in emissions by 2030, which the Climate Change Committee decided, on the basis of all the analysis that it could muster, was not feasible. I know that people differ on this—I know that Kevin Anderson is a critic of this—but I am a big fan of the Climate Change Committee's work, and there was always a concern about the deliverability of the interim target in the CCPU.

People have different accounts of why that target had to be rescinded. Depending on who you speak to, those accounts will vary. Some people will put that down to a lack of effort and so on. Other people will say that there was no evidence base to deliver at that speed, especially in the building sector. The pace was too ambitious. It was not possible to convert half of Scottish homes by the end of the decade in which the CCPU was published. The pace of delivery that was required was incredibly ambitious.

The current plan is incredibly ambitious. I know that, for many people, it is not enough—in many ways, that is what the climate science suggests—but if all countries were doing what Scotland is doing, we would be in a much better place than we are now. If we look at what the plan says about the pace of change, we can see that it has been developed in such a way that the pace of change in transport is a huge ambition. That is also the case with buildings. That is not the case as much as it was before, but the Climate Change Committee now thinks that the pace of change is deliverable. It is easier to go fast on transport than it is on buildings, because of the capital stock lifetimes and so on.

Mark Ruskell: We will come to those sectors a little bit later.

Dr Winskel: My overall point is that the Climate Change Committee has identified a feasible

pathway for delivering the ambitious interim and final targets, and we can work with that.

Mark Ruskell: Okay—thank you. Lloyd Austin, do you have anything to add? If not, I can bring Kevin Anderson back in briefly.

Lloyd Austin: I just want to highlight a couple of things. I agree with Kevin Anderson's global warning, and with James Curran's comments about delivery within Scotland.

Overall, the net zero by 2045 target represents a good contribution by Scotland to tackling the global emergency, if we are able to meet it. The CCC provides advice on how that can be done, slightly moderated by feasibility, achievability and such matters.

The various climate change plans over the years have purported to deliver on those pathways—and the annual and interim targets to start with—and the current plan purports to deliver the budgets leading up to net zero. However, we must recognise that we have failed to meet nine out of 13 annual targets, and we have also had the challenge of meeting the 2030 interim target, which has led to the change to budgets and so on.

The big question, then, is this: the current plan might purport to deliver the budgets up to net zero, but will it do so? I think that there are three challenges in that respect. First of all, will the policies and proposals be implemented? We have to remember that many of the positives of the CCPU have not been implemented or have been delayed. Of course, there is also the question of the 166 recommendations that the Parliament made, and whether they have been taken on board and implemented. The second challenge is whether the policy outcomes and the changes in behaviour—that is, the changes to how we travel, how we heat buildings and so on—will be delivered as a result of the policy measures that are being implemented. Finally, will the outcomes lead to the emissions reductions or removals that are predicted?

As for the answers to those three ifs, the first depends on on-going commitment and delivery. At the moment, we do not have a good track record in that respect, as has been demonstrated by the fact that we have missed nine of the 13 targets. Therefore, the delivery questions and the checks on delivery that James Curran talked about are really important.

As for the other two questions—the other two ifs, as it were—the draft plan unfortunately lacks the details and the transparency that will allow us to reach any conclusion. We cannot tell how the modelling has been done, how the analysis has led to the predicted emissions reductions and so on. The plan purports to meet the budgets, net zero and so on, but whether it meets those emissions reduction targets is a matter of judgment. Given the absence of any new policies, given that we have missed the targets in nine out of 13 years, and given that we are now moving on to the hard stuff, as I described earlier, one would have expected to see some new actions.

However, there have been further delays in the heat in buildings bill; there is a lack of ambition in some areas—for example, in peatland; and there has been a rollback on some of the Climate Change Committee's advice on, for instance, dietary change or livestock. All of that, we believe, has led to an overreliance on negative emissions technologies, which—

Mark Ruskell: We will be talking about particular sectors a bit later on.

Lloyd Austin: All of that leads us to believe that the plan does not rise to the challenge of the emergency.

Mark Ruskell: Kevin, do you have any comments? Please keep them very brief, because we need to move on.

Professor Anderson: I will try to keep them as brief as possible.

I agree with virtually everything that has been said. We have to remind ourselves that the 2019 act made it very clear that it was about Scotland's

"fair and safe ... emissions budget"

in line with articles 3 and, I think, 4 of the United Nations Framework Convention on Climate Change. The zero emissions by 2045 framework—and by "zero", I mean net zero, not even real zero—is what has been determined as being "fair and safe", but the fact is that the science has changed, so it is no longer an appropriate framework for 2045.

With regard to the CCC's carbon budget 7, I have unpicked that in some detail elsewhere. I have not done that so much with the Scottish one, but I have tried to do my best to look at the Scottish pathway—that is, the balanced pathway. The carbon emissions under the balanced pathway for Scotland are equivalent to between three and four times the equal-per-capita budget for meeting the 1.5°C limit. In other words, if you took the global budget for meeting 1.5°C and divided it among 8.5 billion people, you would see that Scotland's balanced pathway assumes that the Scottish people should get three to four times more than the global average. Why should that be? It is, in my view, deeply colonial.

If you take the 2°C carbon budget, it is still more than the equal-per-capita budget, so Scotland is still saying, "For an under-2°C budget, we should be getting more than the average for the rest of the world." I do not know the exact numbers for

Scotland, but the UK is about the 10th richest country in the world, and I think that we are fourth highest when it comes to historical per capita emissions—they are four times greater than the global average. Given that, Scotland has far more to do under what it has signed up to with regard to the equity part of the UNFCCC—this thing that has been given the terrible name of "common but differentiated responsibility"—than simply take an equal-per-capita approach. The point is that, if you want to deliver on the "fair and safe" budgets set out in the 2019 act, you will have to go back and recognise that the balanced pathway that has been given for Scotland—and indeed the one that has been given for the UK by the CCC—is far removed from that. It is neither fair nor safe.

This raises much deeper questions, and it brings us back to the point about the emergency. We had an emergency in 1939, and we responded accordingly. Scotland has not been able to do the work on its houses, because it has not decided to have an emergency. It might have declared an emergency, but it has not put in place any policies aligned with it—we are still selling four-wheel-drive vehicles, sports cars and big houses. Of course, it is not just Scotland—the same is true everywhere. We all make these rhetorical flourishes, and then we deliver absolutely nothing in line with them.

Therefore, if you follow the 2019 act and do the maths and the science, you will end up with very different pathways from the ones that underpin this plan. Indeed, the plan is far removed from anything touching what you would call an emergency.

Mark Ruskell: Okay—

Professor Anderson: Now we are in 2025, and we are where we are. The physics sees through the rhetoric. We just have to be a bit more honest; either we fail, so we should look at what levels we will fail to and start to plan for that, or we pull our finger out and do something in line with our commitments.

Mark Ruskell: Thank you, Kevin. I am aware of the time, so I want to ask the panel for some brief comments, please, about particular sectors. Are there any sectors in the plan that you feel could go faster, or will some sectors that have been identified struggle to reduce emissions that quickly? Are there question marks over particular policies or proposals for those sectors, because they are either too ambitious or not ambitious enough?

Can I get some brief comments on that? I will start with Lloyd Austin.

09:45

Lloyd Austin: The one that will struggle, in our view, is the carbon capture, use and storage and negative emissions technologies sector. We think that there is an overreliance on removals through those technologies; they are extremely expensive, unreliable and unlikely to deliver, and there are very few, if any, examples across the world of those technologies delivering or showing any sign of doing so.

Although we are not opposed, in principle, to continuing that kind of research and development and looking at such opportunities, and although there might be limited scope for deploying them in particularly hard-to-decarbonise industries or whatever, the scale of the plan's reliance on them is excessive. It is partly a consequence of some sectors not being asked to do as much as they could to make the sums add up.

As for those sectors that could go faster, we would highlight agriculture as a particular example. The Scottish Government has specifically decided not to follow the CCC's advice on dietary change and livestock, and that is an area that could be addressed. Moreover, there are other areas of land use, such as sequestration of land for forestry and peatland restoration, where there could be an awful lot more ambition.

Finally, with regard to transport, the vast majority of the predicted emissions reductions come from the electrification of vehicles. That is a good thing, but, unfortunately, an almost exclusive reliance on electrifying all the existing forms of travel will not solve issues such as congestion or deliver health benefits and is not necessarily a fair approach to decarbonisation. There is a policy section on modal shift, but the predicted changes and emissions reductions are very modest, and we would like that to be extended, or to be more ambitious with regard to the shift to public transport, walking, cycling et cetera. In other words, we need more investment in those aspects in order to generate modal shift, in addition to—not instead of—electrifying vehicles.

The Convener: I will butt in here briefly. I am conscious that only two members have asked questions and that another five members want to ask questions. It is fine for the witnesses to keep talking, but I have to work with the five other committee members who you are excluding, so could you be kind to me before Christmas and try to keep your answers as short as possible so that I can bring them all in?

Lloyd Austin and, I think, one or two other panellists mentioned livestock, so I remind members of my entry in the register of members' interests, which shows that I am a livestock farmer and have an interest in a livestock farm in Moray.

That does not mean that I do not agree with anything that you say, but people should bear that in mind.

I think that Mark Winskel is next—your brevity would be of benefit for my Christmas. Thank you.

Dr Winskel: Overall, the big questions that I have about the plan are about deliverability and evidence. I agree with what has been said on deviations from the CCC advice. There are obviously reasons for that in agriculture.

I am sort of a generalist when it comes to the energy world, but we have had a number of transport experts in the UK Energy Research Centre, and I think that one of them—Jillian Anable from the University of Leeds—might be on your next panel. A lot of the work that we have done over the years points to what has been said: that there is a good opportunity to do more on the demand side of transport through policy on modal shift and reduced demand for transport.

Because of the way in which the evidence is presented in the plan, it is difficult to work out where the emissions reductions come from in a very integrated way. That is much easier to do with the Climate Change Committee's advice, which is clear that electrification is the huge enabler of all of this. The plan does not say much about electrification, because that is seen as a UK Government or business responsibility. The huge risk or uncertainty that underpins the plan is about whether we will have the electricity available to do all these things on transport and heating. That issue is hardly mentioned.

A colleague in the UK Energy Research Centre, Professor Jan Webb—who has given evidence to another committee on the issue—is very critical of what she has seen on heating, with lots of aims rather than proposals. The proposals are not really proposals, and what has been said very much resonates with what she has said. There has been a rowing back on ambition on heat in buildings and we have a statement of ambition rather than proposals. That is an area where, earlier, Scotland was very much at the forefront.

To be brief, the concern is not really about the fine tuning of sectors; it is about the deliverability and evidence for this and how it will happen.

Mark Ruskell: Thank you. Jess, do you want to come in briefly?

Jess Pepper: I endorse the point that it is difficult to see the detail. There are good ambitions, but it is about understanding the how. I will not go over that again.

I will mention a couple of things that might not otherwise come up. We are perhaps missing an opportunity to help us to understand how robust the plan can be, in that there is not much about collaboration and leadership that is happening in other areas and how that relates. I know that this is not all necessarily required, but education, connections with health, tackling poverty, public procurement and elements of public funding all need to be integrated to ensure delivery. Those things are essential, but understanding how they relate to one another is missing.

I agree with other commentators about the heavy reliance on CCS, for example. It is unclear what will happen if that does not deliver. There is a history on that issue. In October 2023, the executive director of the International Energy Agency said:

> "The history of CCS has been that of great disappointment".

I will put in a nugget the story, which comes from the Climate Reality Project. Twenty years ago, worldwide, we were able to capture four hours of annual emissions with CCS. Over the past 20 years, improvements have been made and we are now able to capture 12 hours of annual emissions, which is 51 million tonnes. Compared with the emissions that we need to be capturing, that is just a scrap. According to data from the International Energy Agency and Bloomberg New Energy Finance, actual emissions in 2024 were 37.4 billion tonnes. I can provide the committee with the links to that. I am inspired by the exhibition in the public lobby, where one of the speakers says that they are getting curious about what is going on there and why there is an established view. That might be something to think about in the context of the plan.

Professor Curran: I will try to keep this brief. I agree with everything that has been said, but one sector that deserves mentioning is the circular economy. The word is used under "Waste" in annex 2, but the issue is not developed and barely mentioned. Kevin Anderson emphasised that we live in a global community, that this is a global emergency and that Scotland is offshoring a lot of its emissions. I understand that we are talking about a target for territorial emissions, but we have a moral and human rights obligation to think about the wider world issue.

Scotland's territorial emissions have fallen by around 50 per cent. However, the carbon footprint, which includes consumption in Scotland, has fallen by only 20 per cent. We are offshoring a lot of our emissions. It just makes sense to rapidly develop a more circular economy, because many of our emissions in Scotland are related to our use of materials. We have a very high per-capita use of materials, and they are very largely virgin. Scotland has barely begun to develop a circular economy.

Mark Ruskell: Are you saying that that sector, or that approach embedded in other sectors, could go a lot further, or are you saying that consumption targets are not clear through the CCP and that we should be building those in in some way?

Professor Curran: The issue is just not addressed and it is not mentioned as a possible solution. There have been estimates of by how many million tonnes territorial emissions would be reduced through a fully functioning circular economy. They are a bit all over the place, so I will not even quote a number, but they are significant. The issue needs to be addressed because of the global impact and to make our economy and our civic society far more resilient in the face of accelerating climate change, which will disrupt global supply chains. It is good for the economy, employment and gross domestic product, and it reduces emissions.

Professor Anderson: I want to reinforce the views on carbon capture and storage or negative emission technologies, engineered removals or whatever you want to call them. Those do not occur globally. Eleven million tonnes were actually captured and stored. The figure of 51 million-odd tonnes includes enhanced oil recovery. In other words, what we captured, we used to squeeze out more oil. If you look at the bit that is actually used and stored, CCS delivered only 11 million tonnes globally in 2024. That is one third of Scotland's emissions. On carbon dioxide removal, 0.6 million tonnes were collected and stored geologically in 2024; in other words, that is 0.0003 per cent of global CO_2 emissions. Yes, research those technologies, but take them out of your plan, because they do not exist at scale today. They are a ruse from the fossil fuel industry to maintain its thriving sector.

On transport, the belief in electric vehicles needs unpicking, and the same goes for the CCC. Yes, if you are going to buy a car, buy an electric car, but Scotland has 2.5 million cars, over 2.4 million of which are still internal-combustion-engine cars. If you are going to swap them out one for one—which is what the CCC assumes and, as far as I can tell, is not far off what is assumed in the plan—that is another 2.4 million electric cars. Each car weighs 1.5 to 3 tonnes and has a 50 to 100kWh battery. That will require a huge amount of resources, including financial resources. If you multiply 2.4 million cars, by, let us say, £25,000, which is pretty cheap for an electric car—remembering that you cannot buy them second hand, because they do not exist yet—that is £60 billion just for the cars. That is ignoring any infrastructure for electrical charging and renewables to generate power for those cars.

We should also remember, as I am absolutely certain that Jillian Anable will point out, that cars are parked for 96 per cent of the time. Scotland's plan is to spend a huge amount of resource—financial resources as well as labour, capital and political capital—on a technology that 96 per cent of the time is parked. Some clever person will tell you, "Oh, we can use them for storage." However, about 40 per cent of Scottish households do not have off-street parking, so I do not see how you will be charging those very conveniently. Also, we do not know how people will use those cars. Therefore, it is not sensible to just assume that there will be storage capacity. There will be some storage capacity, but not a lot.

We are locking ourselves in to that on-going industry. We should think about the fact that each car weighs 1.5 to 2 tonnes. I weigh 80kg. Typically, a car is used by someone like me who weighs 80kg to drive 10km to pick up a couple of bags of groceries or a small child from school. In our urban environments, we have normalised a mad form of transport. We now have an opportunity to think differently, but we are not doing so. We are just going to swap out internal-combustion-engine cars for electric cars with all the problems that that will cause, with huge associated costs and still with the air pollution from tyres. We really have to think very differently.

10:00

Aviation also involves carbon dioxide removal, negative emission technologies and sustainable aviation fuel, or SAF, which is a nice little acronym. Two per cent of current aviation fuel in the UK is SAF. Under the SAF mandate from the UK Government, you are not allowed to use agricultural feedstocks. Unless Scotland is going to convert all its diet to fish and chips, it will not be able to provide anywhere near enough. SAF is just a token gesture, given what you can provide for aviation. Because the aviation industry also has a stranglehold on our policy makers, people think that we can apply this SAF thing, which means that we can carry on expanding our airports, buying the planes that last for probably 20 years and locking in more kerosene use, all under the ruse of some future SAF protocol. Even if you produced the fuel synthetically, there would be huge energy issues with producing synthetic kerosene from electricity. I will not get into that here, but it is a long way off and would place huge demand on the grid.

On transport, a few technical ruses have been thrown in rather than thinking fundamentally differently about planning, active travel, public transport and all the other things that need to be factored in, and in a really serious way, not in the

token gesture way that they have been put into the plan at the moment.

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

The Convener: We need to be really careful on all of these things. Please try to help me prior to Christmas. We are at 10 o'clock now, which is halfway through the session, and we are four questions in of potentially 12, so I ask people to please cut it short where you can. I understand that people feel passionately about the issue, but if you could help me, that would be appreciated.

I thank Monica Lennon for agreeing to drop her supplementary question, because of time. Bob Doris, over to you.

Bob Doris (Glasgow Maryhill and Springburn) (SNP): I hope that my question will be helpful. It will also be brief, and it will be technical.

I want to better understand the targets in the draft climate change plan that are derived directly from the Scottish Government's policy intentions, and what the actual baseline policies are. I want to check that I have understood this correctly. I will use transport as an example. I can see that there is an expectation that from 2026 to 2040 there will be a reduction of 23.8 million tonnes of CO_2 equivalent as a direct result of Scottish Government policies, but the overall reduction will be 38.3 million tonnes—if my eyesight does not fail me. The point is about the difference between Scottish Government policies and external factors such as private sector change, UK Government policy, the cost of energy, dietary changes and other things that are not directly within the Scottish Government's control.

How best can we understand the numbers in the draft plan? Is there enough information to allow people like you to take an informed view as to whether the numbers stack up or do not stack up? Is there a need for more transparency around how the modelling works and how those numbers are arrived at? That is not a question about whether the plan will be successful or not; it is about how we can best understand the numbers in the plan in a reliable way. That was a lengthy question, but I have tried to be very specific in what I am asking.

Lloyd Austin: When I referred earlier to a lack of details and transparency, this is one of the areas that I was particularly thinking of. You are right that for each sector the plan suggests a baseline, which is, in effect, what would happen to emissions if the Scottish Government did nothing. Those baselines vary, so in agriculture they fall and in transport they rise. The emissions reductions that are predicted from the policies in the plan are from that baseline, if that makes sense.

Each time that a baseline for a sector is presented, a series of assumptions are set out. For instance, for transport the assumptions include a forecast of future demand, car miles driven, passengers per plane, consumer choice, technological progress, fleet replacement and so on, but there is no explanation of those assumptions. For each sector, there is a paragraph in the plan that lists the assumptions for the baseline, but there is no explanation of what those mean and whether they may, or could, be influenced. That means that there is a lack of clarity in the baselines. I think that those assumptions ought to be explained in order to provide greater transparency and allow us to understand whether the plan will deliver.

The second part is the emissions reductions from those baselines. Again, the draft plan sets out the policies and proposals to deliver those things and then tells you what the predicted emissions reductions will be. However, that is as a result of the modelling work, which again includes assumptions. For instance, if you set up a grant scheme for the installation of heat pumps, the model predicts that X percentage or Y thousand people will take advantage of that grant scheme and there will be that number of households that change heating. What the plan does not show is how that modelling works. It is a black box. We just have to either believe it or not believe it. We would very much like to see more information about those assumptions and those modelling assessments so that we can understand whether or not we should have faith in them. At the moment, it is a black box; it is not transparent.

Bob Doris: That is helpful. I know that Jess Pepper and Dr Winskel want to come in here. We will have one more reply after this. If there is a consistency of answers, we can move on, given the convener's appeal. Dr Winskel, I will take you after Jess Pepper.

I would make the assumption that Government assumptions fall within a range. The Government cannot land something to the exact pounds and pence of cost or the carbon reduction threshold—there will be a range. What is the range that the Scottish Government is working to? Is it the most optimistic part, the most pessimistic part, or has it laid it bang in the middle? What has informed the Scottish Government's view? Lloyd Austin seems to be suggesting that there is a void at the moment in understanding that.

Jess Pepper: That is the reality—we do not really know. We do not have that level of detail. I was going to keep this short and say that we need more transparency and we need more information about what the assumptions are based on. One thing we can be sure of is that things will shift for various reasons. That gets into what you know

about the indicators; if we are measuring one thing, are we measuring where things might have gone in another direction? It also gets into risk—I do not know whether you want to talk about that separately. We need more transparency and more information for this to be tangible and for people to be able to bring their insights and understand what is going on and how it will change if assumptions shift or the basis for them changes.

Bob Doris: That is helpful. Assumptions are the best predictability and the best estimates of data at any given time. They should change—of course they should.

Jess Pepper: Yes, but we should know what those are based on, remembering in particular that our track record on reducing emissions in transport is not great. What are we basing our assumptions on? We have just had to scrap the 2030 target. Presumably, that was based on assumptions that have not come to fruition, so we need to be confident now.

Bob Doris: That is helpful. I am sorry for truncating your reply, Jess. Dr Winskel, do you want to add anything?

Dr Winskel: You have identified an issue with the way the information is presented, which is the baseline. The way the emissions envelopes are presented in annex 3—which is where the details are, such as they are—is in overall sectoral emission reductions, baseline pathway and then CCP policy costs. All that is costed in the plan is the CCP policy costs, and not for all sectors.

I am not sure that I have this right, but I think that about half the emissions reductions in transport are on the baseline. The plan costs are about half of what is being delivered. That is reasonable to some extent if you are saying that other people are taking care of those costs, and this plan is about costs to the Scottish Government and the Scottish public purse. However, that needs to be a bit clearer.

The UK Government followed the same approach when it published its carbon budget and growth delivery plan recently. In that case, we had all kinds of details. There is quite a lot to say about this. We do not have those details.

The other issue that I am concerned about is that each sector has done its costings differently. We do not have a consistent approach to the treatment of costing and where the costs are appearing. If you take the building sector, which is a huge area of cost, a surprisingly low cost figure is presented in the plan, in both the first summary report and the details. It is much lower than transport, for example. That is surprising because, in almost all analysis, buildings is the biggest single capital cost. It is there in the CCC plan and the Scottish Fiscal Commission's analysis.

Why is that low relative to transport, for example, and others? In the buildings bit of annex 3 it says:

"Costs associated with the delivery of the clean heat target are included in CB1"

for the first five years. For subsequent carbon budgets they are not costed because there is so much uncertainty about second and third carbon budget periods. The costs are not there, as far as I can see, so that is a huge area where costs do not seem to be represented. It just seems very odd. It is there for domestic buildings, and commercial buildings appear in a different sector.

The other thing that you said, which is also very important, is that there is no uncertainty analysis. There is no upper or lower bound or mid-range scenario, which is what is provided in most of these exercises. That analysis will have been done inside Government, but it is not presented, so we are just given a central point.

There is one sector that that is done for, which is the industrial sector. The plan talks about three scenarios that it has developed: you are given the mid-range and you are given upper and lower bounds, or they are at least referred to. However, it is odd that each sector seems to have gone about that in a different way. You would hope for some consistency of analysis across the sectors.

Bob Doris: I will not follow up on that, Dr Winskel, but it is very helpful. If the Government can do that for one sector and provide the range and give a bit of an explanation, why not across the board? Thank you.

Douglas Lumsden (North East Scotland) (Con): I will be brief because we have covered bits of this already. As we have heard, the Scottish Government has stated that it will diverge from the Climate Change Committee advice on some of its pathways. There is alignment with things such as car and van decarbonisation but there is divergence on things such as agriculture and peatland restoration. Do you understand why that is? Has the Government set that out in its plan? I will come to Professor James Curran first.

Professor Curran: Again, the situation is not transparent and it is not clear to me why there are those divergences from the best available advice. Others on the panel might know the background to that, but it is rather mysterious to me. Why is there divergence in just one or two sectors? One imagines that it is something to do with the acceptability and feasibility of the proposals, or their political ramifications, but others might have greater insight than me.

Douglas Lumsden: Lloyd Austin, I will come to you—I saw you almost raise your hand.

Lloyd Austin: I agree with James Curran on the generality: the reasons are not set out in full. The agriculture divergence is a significant one, particularly as things such as dietary change are built into the agriculture baseline. Some of the baseline decline in agriculture is due to predicted dietary change across the whole of the UK as a result of consumer and customer preferences, which it is assumed that Scotland will follow. However, the Government has not adopted the CCC advice to seek to make that change happen faster or in a different way, which is concerning.

10:15

The Government has also not accepted the CCC's advice regarding the hectarage of peatland that can be restored per year. In part, I understand why that is. It has not met previous years' targets for restoration because of practical issues around the availability of machinery, labour and so on, so it has built in a slightly lower per year target. That is understandable, but I think that it should have policies to address those practical issues, so that, in the later years of the plan, it can increase the target. However, it has not done that.

Douglas Lumsden: Lloyd Austin, you mentioned that predicted dietary change was partly responsible for the baseline decline in agriculture. Relying on that would almost amount to having a policy on dietary change, so do you think that that is why the Scottish Government has avoided going for those additional savings from agriculture?

Lloyd Austin: Yes. The CCC advice is that there should be a policy to encourage lower meat and dairy consumption, but the Scottish Government has not adopted that. The plan just has that baseline change—it has not gone further.

I point out that the national health service advice is to reduce meat and dairy consumption, as the current average consumption is above the NHS advice for healthy diets. However, we apparently cannot adopt that approach in our climate change plan. The health department and the climate change department have different approaches.

Douglas Lumsden: Thank you. If no one else has a view on that, I will end there.

Michael Matheson (Falkirk West) (SNP): This is the first carbon budget that the Scottish Government has produced—previously, it has gone for annual targets. Clearly, the UK Government has experience in this area, as it is on its sixth carbon budget, although I think that the two previous ones were ruled as being unlawful in that they did not comply with the climate change legislation. Lloyd Austin, does the move to carbon budgets from annual targets give you greater confidence that the necessary progress will be made?

Lloyd Austin: Thanks for picking on me. I do not think that I can say yes or no to that question. It is a different way of measuring progress, for sure. On the overall monitoring, reporting and evaluation process, it is important that the Climate Change (Emissions Reduction Targets) (Scotland) Act 2024 that was passed last year includes annual reporting on emissions. Although the budget is over a five-year period, we will see in each of the five years of that budget annually whether we have achieved 20 per cent of the budget that year, which means that the debate about whether we are on track will still be there.

I am not sure that my confidence is based on whether there is an annual target or a five-year budget. I am more concerned with whether the policies are robust, whether there is machinery to deliver them, and so on. That is what will define whether or not the plan works. In a way, it does not matter how you report and measure as long as you do so.

Michael Matheson: James Curran, do you have a view on whether the Scottish Government can learn lessons from the UK Government's experience of using carbon budgets?

Professor Curran: Using carbon budgets strikes me as a sensible move. Statistically, it is a more robust approach. Admittedly, some targets were missed previously because the rules for doing the calculations were changed by the Intergovernmental Panel on Climate Change, and so on. If they change mid-year, you have to back-calculate, which creates noise in the signal. That, in itself, can be important because missing targets undermines public confidence—dare I say even political confidence—in the robustness of the plan and the ability of Scotland to deliver what it said that it would. Doing a five-year budget removes some of that noise in the signal and, therefore, you get a more credible result.

I was the adviser to the Isle of Man Government when it decided to create a climate change act and a climate change plan. I helped compose those and, having learned from Scotland, we used budgets rather than annual targets.

Jess Pepper: For the public, it is easier to get a handle on annual targets and to understand the progression if they are used. They enable us to see where we are going and whether the milestones have been reached. Budgets probably feel less transparent and there might be a feeling that it is not as easy to hold the Government accountable because there is more in the mix.

On communication tools—communication matters a lot in this—there is a need to ensure that the accountability is transparent and that it is clear

to see whether we are on track and are delivering. That enables people to have confidence in the process, and confidence is key, as folk have to feel that the measures are helping. Using annual targets probably makes it easier to ensure that that transparency is there, so a bit of work will need to be done in that area.

Dr Winskel: This is a slightly different point, but I think that what is missing here again is annual policy costing. There was some hope and expectation from bodies such as the SFC that the plan would show annual Government budgets aligning with the delivery of the plan. At some level, it is useful to have these five-year budgets, as we are all used to that model and know that things fluctuate from year to year and that there are all kinds of year-to-year differences that make meeting annual targets difficult in some years.

I am comfortable with five-year carbon budgets, but it is also important to have budget lines for annual spend. Of course, you cannot do annual projections with any real confidence over 20 years, as things will change a great deal over such a period, but it is important to show that the analysis is there and that there is a rough idea of what the midpoint estimate in any one period is, although that will need to be updated constantly. However, that information is not provided at all in the plan.

Professor Anderson: I will just come in quickly on that. Budgets and percentage reductions are useful. People like me and, indeed, probably quite a few of those providing evidence today, use the budgets. They mean something to us. They allow us to test what is being proposed against what is necessary for a fair and safe response from the Scottish Government. Annual targets are slightly less robust in terms of our ability to do that sort of analysis.

One issue is that, to most people—indeed, probably for most of you here—saying that we have only 15 million tonnes in the budget for the next X years means nothing. However, if I said that you need to reduce emissions by 8 per cent every year, and that that is 3 percentage points higher than we achieved during Covid, you would probably have some sort of handle on the issue—you might think, “Oh, that sounds like a lot”. Which of those approaches is most useful depends on the person who is using them. Both are helpful: the budget approach is helpful for geeky analysts like us; and the percentage reduction approach is useful for the public or people who are less familiar with the details of the science and so forth, which the budget framing fits more closely with.

Michael Matheson: Thanks. Turning to policy options, we have a Scottish target of achieving net zero by 2045 and a UK target of doing so by 2050. Something that has often been underestimated in the past is the interlink between the policy options of the UK Government and how those impact on Scotland’s targets, and how Scotland’s options and the targets that Scotland sets then have an impact on the rest of the UK and the UK target.

James Curran, do you think that the draft plan properly reflects the interplay of policy options that the Scottish Government needs the UK Government to implement to support it and assist it in being able to achieve its objectives? Let us take transport as an example.

Professor Curran: You can probably guess my answer. My answer is no. There is insufficient detail right across the whole plan on those interdependencies, which can be internal policy dependencies within Scotland and within the UK, or even wider, in terms of trade agreements and so on, which is a whole other area that merits some attention.

It is very difficult to assess those interdependencies. They need to be assessed as time passes. It goes back to what I said at the beginning. In a robust, professionally managed approach, the professional programme managers will be constantly assessing the interdependencies and they will be changing the route map, the decision-making procedures, the budgets and the resources allocated, depending on the whole range of interdependencies. It is fundamental to good programme management.

Lloyd Austin: I very much agree with what James Curran said. I will add a couple of things. In some areas of the plan, it describes what the Scottish Government would like the UK Government to do to help it deliver on its plans. On transport, for instance, it talks about how it would like vehicle excise duty, fuel tax and other measures that are reserved to be changed in order to contribute to the changes in travel that the Scottish Government would like to happen.

In other reserved areas, the plan is relatively silent and it does not identify what it would like the UK Government to do. One very topical and sometimes controversial issue where it is silent is on oil and gas. Despite us putting out a draft energy strategy several years ago now that talked about oil and gas futures, we do not have a finalised energy strategy and the plan is quite silent on what the Scottish Government would like the UK Government to do with its reserved powers in that area.

We would like the Scottish Government to be much more robust in arguing the case for a managed just transition and rapid wind-down in oil and gas production and use. That is one area where it could do more. Aviation, as Kevin Anderson mentioned earlier, is another area where there are an awful lot of reserved policies and where the Scottish Government could, if it

wished, take a lead in arguing the case for faster and more robust action by the UK Government in those reserved areas.

Dr Winskel: The recent SFC report on costs of mitigation says that 81 per cent of expected public spend by 2050 resides with Scottish Government devolved areas. If one thinks about where emissions reductions have come from up until now, three quarters of that has been from electricity supply, which is a mostly reserved area. This plan says very little about energy supply. The costs are zero throughout the period because they are seen as a UK Government responsibility. This is a very different plan, about costs for transport and buildings, which are essentially devolved for the most part.

We need to consider the political risk and delivery risk that are presented through what is happening at Westminster and the changing politics of net zero. I have already said that this plan is underpinned by a massive expansion of the electricity system. It is remarkable how, three times by 2035 and four times by 2045, it has to quadruple in size.

10:30

That has to happen at the Great Britain level and the GB grid is managed as a GB entity. We have huge congestion charges at the moment because the grid is inadequate for shipping renewables around the country. None of that is really mentioned. That underpinning delivery risk needs to have better profiling.

The philosophy of the plan is very much to deliver the additional Scottish policy costs and focus on that. That is what we see in the plan in terms of costings and emissions reductions—it is about that part of the problem. However, delivering that is affected by what is going on outside of that, with the UK Government and other things. It would be good to know how that is being thought through. People have said that carbon capture and storage is not part of their preferred pathway here. What if the UK Government decides that it is not its preferred pathway either? What will the Scottish Government then do about the Scottish cluster? It is very difficult. Those things need thinking through and need to be presented. I would like to have seen a bit more about thinking through those what-ifs and how we could make up shortfalls and contingencies.

Jess Pepper: I think that—[*Interruption*.]

The Convener: I am sorry. I did not know my microphone was on. I was gently reminding the deputy convener that Kevin Anderson wants to come in as well. I am sorry if I have put you off your stride—I apologise.

Jess Pepper: That is okay. I wonder whether there is an opportunity here. There is plenty of content within the annexes on how these relationships with the UK work. We have an opportunity to structure our climate change plan so that everybody can see where all the roles and responsibilities lie across Government, across the different parts of governance and different directorates within Government and across public bodies, and the connections with civic society and the business community.

Structuring that clearly, which is what we keep coming back to, means that we can be super transparent about what we need to do, how we will do it, who will be involved, where the responsibility lies, what we need to do by when, and how that will be resourced. In the ethos of the Parliament, it could be open and accessible, transparent and participative so that everybody in this nation can get involved. If it is clear and accessible, people can pick it up or go online and check out where we are, what the snapshot right now is, why those assumptions have changed, and understand that it is because there has been an event or something has shifted in the global context.

There will be challenges and there will be opportunities. I think that we are missing the opportunity here and we really need to grasp it. What I am hearing and seeing is that once folk get plugged into this, with climate action in their own communities, their own workplaces or their own schools and campuses, there is an energy and an excitement about getting it done. It will do so much good as well. It is about structuring the very core of the plan so that it is not about somebody having their plan over here and someone else having their plan over there, which is what is happening on the engagement right now.

Folk are developing toolkits but nobody knows how those necessarily all join up together because there was not a plan for engagement. The plan was not anticipated and shared among those who needed to be involved upstream, months in advance. It was shared at the end and introduced to folk with, “Here is what you need to do,” two weeks after the consultation had launched. There was no need for that. We knew that it was coming. We could all have been involved. We could all participate in a much fairer way as well. Let us not miss the opportunity that we might have ahead of us. A lot of this is about restructuring and that also helps us spot the gaps.

Michael Matheson: As ever with a plan, there is usually a price tag attached to it as well. You have mentioned heat in buildings as one of the big emitters. It is an area where there is a need for significant investment to address issues. We also need to change people’s behaviour much more around transport in the public transport space and

expand and develop that. Those bring big capital costs to the Scottish Government.

When the UK Government decides to cut capital expenditure within its budget, that then has a direct impact on the capital allocation to the Scottish Government. What should the Scottish Government do in those instances if that then undermines the carbon budget that it is trying to pursue in relation to reducing emissions from buildings or reducing car usage by investing in alternative means of travel? What should we do about that? Jess Pepper, given what you were saying earlier, we have a plan—who is responsible? What should we do?

Jess Pepper: The top line is that whose responsibility it is and what the context is right now needs to be communicated clearly. It is then easier to point to an area and say, "There has been a shift here. This is what has happened. How do we respond to that?" and it opens up the question more widely to a collective response.

Scotland has had—and this has been disrupted in recent years—a huge understanding, knowledge and solutions focus, for example, on community transport. That is an area of learning. People can figure out what the options are. People who are having these conversations, coming up with solutions, sharing their experience and learning in their different communities across Scotland or in their different working contexts or their lives, can share what is happening.

If we have the processes in place that support such a plan, there is then a means to switch. I will not go into the detail of that, but if you have the framework in place to be able to clarify that and go to our established processes, that can be very inclusive and it is a quicker way to get to solutions than just having a policy that might then have to be filtered down and does not necessarily benefit from or respond to the experience across our communities.

Michael Matheson: Mark Winskel, you said that 80 per cent of the costs associated with tackling climate change rest with the Scottish Government side of things. What do we do if the UK Government changes its budget profile and that has a direct impact on the Scottish Government's budget allocation to do these things?

Dr Winskel: I will try to get to an answer. The CCC has a great chart—I have it here—that shows how costs and benefits change over time. There is a black line just after the mid-point, where the figure goes into benefit rather than cost. The whole challenge is in how we smear costs over time—how we get over the hump of capital expenditure, particularly for heating. Transport is not as much of an issue, because consumer choice will drive that, to a large extent, as electric vehicle costs go down.

There is obviously the cost of the things that Kevin Anderson has mentioned, but the two big up-front costs are the cost of strengthening the electricity grid—UK/GB network companies are allowed to invest in that, so, at the moment, that is largely covered by electricity bills—and the capital expenditure on heating, which is the big one for the Scottish Government. The evidence suggests that there is a question about the balance between heat pumps and heat networks. That debate has been around for a long time, and the shift here, in the plan and based on what the CCC has said, is mostly about electric heat pumps. There is a specific concern about pushing back on heat network legislation, which is now seriously lagging behind in that there is no requirement for heat network development in the way that there was.

I did some work on capex on heat pumps with others in the UK Energy Research Centre, and there is a big challenge here because it is quite difficult to get heat pumps as cheaply as people are used to getting boilers. The big challenge is in persuading people to replace gas boilers with heat pumps for many homes. The work that I was involved in said that we cannot really do that, although we have seen great cost reductions in things like solar photovoltaic, wind power and, increasingly, electric battery technology. It is also difficult to get a shift to heat pumps because they are a more complicated bit of kit and they are quite disruptive in some people's homes. People's views will differ about how disruptive they are, but, over their lifetime, heat pumps are very attractive. They are much more energy efficient and involve much less demand for energy going into heating than the way we do it at the moment. Why can we not devise a clever policy to smear the cost over their lifetime? Why can we not offer a heat service based on heat pumps? Why can we not have rental schemes for heat pumps? I am still wondering why we cannot do that. There is no mention of it in the plan, although other countries are looking at that—there are some interesting pilot schemes in places like Germany. It is a common international challenge and it needs to be gotten over.

As I mentioned before, I do not think that the costs in the heat sector are being presented. I suppose that it would look very expensive and be politically challenging to put those costs on the page—I do not know; the analysis will have been done—but I think that there are intelligent policy ways around that. I would like to see more work in those areas and more pilots happening in Scotland on those.

Michael Matheson: Does James Curran want to comment?

The Convener: The deputy convener has singled out Professor Curran. We will then go to Professor Anderson.

Professor Curran: I agree with what Mark Winskel just said. Things are beginning to happen to address the nature crisis, which I have experienced a little bit. There are now mechanisms for blended finance, de-risking, stacking of returns on investment and so on, which can make private investment attractive. Overall, this climate plan makes money—just—does it not? It breaks even and goes a little bit into the black at the very end. So, within the plan, there are strands where, with the right policy background and the right de-risking by the Government, I am sure that private sector money can be involved. If you can get private sector money involved in biodiversity, surely you can get it involved in some of these sectors. Again, it comes down to having a robust, managed plan that can be flexible and adaptive as the political and economic framework begins to shift around it.

The Convener: Kevin Anderson has been waiting patiently.

Professor Anderson: My first point goes back to the earlier question about budgets. If you look at the targets for 2045 and 2050 from a budget point of view, it is just noise in the system—it makes no difference, as both targets are aligned with roughly a 3°C warming future. Does the difference between the UK position and the Scottish position make any difference? Remember that those five years will not see zero emissions; it is about reaching net zero emissions. If you look at the budgets underpinning the two targets, you will see that they are very similar.

I should say that, in the net zero plan for the UK, we will still have 30 million tonnes of carbon dioxide being produced from fossil fuel combustion in 2030. Going back to some of the earlier points, the reason why we have scanned that is that we assume that there will be negative emissions technologies that will suck that out of the air in the future—our children will deploy those things. That allows us to have these net zero framings.

I would say that, from a science point of view, the targets for 2045 and 2050 are both based on a 3°C warming future.

On the other points that have been brought up, I completely agree with Lloyd Austin on oil and gas. The word “oil” is mentioned once in this document. This is a carbon plan for Scotland, which has a huge oil and gas industry that I used to work in—I used to design and build offshore oil platforms—but oil is mentioned once and gas is not mentioned at all. Sorry—there is one mention of gas, but there is no reference to the industry.

On heat pumps, it is interesting to look at Sweden, where I have worked quite a lot. A long time ago, Sweden switched to heat pumps and district heating from an oil central heating system that was very similar to what we have in the UK. We have a gas central heating system; Sweden generally had an oil central heating system, and it switched very rapidly from oil to heat pumps and district heating. It did that a long time ago, when there was no climate emergency. We now apparently claim to have a climate emergency, yet we are still banging on about how challenging it is to make these things work. They have been working in Sweden—which is quite a chilly country with some similarities to Scotland—for decades now.

On the cost side, I always find that a lot of the financial approaches are manufactured. You can change things with discounted rates and so forth, so you can make arguments any way you want. Personally, I like the idea of standards. You put a standard in place, the financial directors of companies squeal and then the engineers deliver—that is the history of standards. In the end, the industry delivers because the engineers find out how they can do something. As long as it is reasonable within the rules of physics and technology, the engineers find ways to do it and it is broadly affordable. Whether you are looking at formula 1 cars or heat pumps, that approach works across the board. I would say that you should have the courage to put in place standards that drive the industry and put your fingers in your ears to the financial directors’ squeals. That is the way I would try to deal with some of the economics of this, which I think are fairly spurious.

10:45

Also, when you look at the economics, the cost of doing something has to be compared with the cost of not doing it—and I do not see anything about that in the plan. What is the cost of a 3°C warming future for Scotland? Who has estimated that? You have to make such comparisons. If we do nothing or if we just play around with the climate change game, we will have to put in place, as best we can, the wherewithal to deal with the impacts of climate change, and that part of the cost structure is simply missing from the balance sheet.

Kevin Stewart (Aberdeen Central) (SNP): We live in a world in which anti-climate change rhetoric is growing. Jess Pepper said earlier that she sees energy and excitement about change from people, but I do not see that, I have to say. I have been knocking on a lot of doors of late and it is not one of the top issues; it was probably higher up the agenda previously. Folk listening to this evidence session will probably be somewhat

bamboozled by what has been said. Folk have asked for more detail about the plan itself because there are too many assumptions, and what about the what-ifs? Assumptions have to be built in. We have heard about flexibility and being adaptive; we have heard various things about what is missing and what should be in. However, folk do not want too many assumptions; they want more detail, so I wonder what people out there will think of that argument.

A lot of this is about delivery. Earlier, Professor Curran mentioned the flood risk management in Scotland arrangements for 2012 to 2016 and talked about how that was done, the project managers and the rest of it. When it comes to delivery, has that worked? I make a point about the flood risk at Whitesands in Dumfries—an area of Scotland that I do not know particularly well but which has featured in the Parliament quite a lot—because there has been no delivery, yet I am quite sure that it featured in your plan for flood risk management in Scotland.

Why have we had the argument around the plan today—on what is there, what is not there and what should be there—why have we not thought about the what-ifs, and why are we not talking more about delivery?

Professor Curran: Wow, what an interesting question. I am very glad that it has come up. The bit of the plan that I was responsible for delivering was delivered—I promise you that. Subsequently, of course, the local authorities with central funding need to—

Kevin Stewart: Can I come in on Professor Curran, convener?

The Convener: Sure.

Kevin Stewart: I recognise that the bit that you were responsible for was delivered, but the practicalities of flood defences and flood risk management have not been put in place due to arguments at lower levels. We are arguing today about a climate change plan, and the Scottish Government will not be responsible for the delivery of a huge amount of it, but we want all the detail of what the Scottish Government will not be responsible for.

Quite simply, this is about delivery. The Government can put together a plan that looks immense and entirely workable and that, perhaps, everybody could eventually agree on—although that is doubtful—but none of that works if there is no delivery. That is my point. We are arguing the semantics of all this, but delivery is key. Delivery is king or queen, is it not?

Professor Curran: I absolutely agree with that. As I said right at the beginning of the meeting, it is all about the delivery of the plan. I will not go back into the detail of the flood risk management—

Kevin Stewart: Actually, I wish you would because you said that your part was delivered—

Professor Curran: Yes, it was.

Kevin Stewart: —but the reality on the ground for people who have faced flooding in various parts of the country is that it has made no difference; they are still being flooded.

Professor Curran: A lot has been delivered. The whole purpose of the Flood Risk Management (Scotland) Act 2009 was that risk would be assessed and, through that risk assessment, there would be a prioritisation of public spend. That was the highly charged political element of that particular programme. Politics was right at the heart of it because you are right that local communities get very worked up and stressed if they are at risk of flooding, which has health impacts and numerous other impacts. A prioritisation mechanism was put in place so that public spend was used on the riskiest areas and for the most damaging floods at that time. Of course, that list is being worked through over the years.

On the wider question, it is very important that the public remain fully convinced about climate change. Opinion polls show that the Scottish people are stable in their commitment to climate change. I agree that climate change—or the environment or similar—has dropped down the list of top issues; it is now number 6 or 9, depending on the opinion poll, whereas it used to be up at number 1, 2 or 3, along with the environment. I used to look at those opinion polls very closely. However, the World Economic Forum's top four global risks are still climate and nature related. The issue has not gone away, and it is reassuring to me that the Scottish public remain stable in their commitment. I looked up the numbers: 72 per cent think that climate change is an immediate and urgent problem, and 44 per cent think that reaching net zero would improve their lives.

That takes me on to the codicil to that. A missing feature of the draft climate change plan is that there is no narrative that gives people the feel of what living in a net zero world would be like. It is all costed out and, as you hint at, the discussion that we have been having is very nerdy and technical, and I am sure that 95 per cent of people would be mystified or turned off by it. There is no narrative that gives the emotion; that is about human rights, the lifestyle that we can lead and our contribution to the planet; and that says that people will have a better life in a net zero future. That is missing, which runs the danger of people in Scotland beginning to lose their so far stable commitment to acting on climate change. We get

the impression that the political realm—certainly internationally, perhaps in the UK and perhaps even in Scotland—is wobbling a little bit, so it is vital that the public remains fully committed and fully engaged to give politicians the reassurance that they are doing what people want.

Kevin Stewart: Mr Austin is signalling, so I will take him now.

Lloyd Austin: I agree with James Curran that it is an interesting and important question. I agree also about the opinion polls.

There is a range of responses to that. The first is that we are having a very technical—might I say nerdy?—discussion about the details of a plan that is one aspect of the Government's response to the climate challenge and its legal responsibilities. Associated with that, it really ought to have—I know that there are plans for this, but how advanced and effective they are will have to be seen—a communications and engagement strategy with different explanations and messages for different audiences, styled in the appropriate form, so that you can embed and even enhance the widespread public support for action on climate change.

An important aspect is that, as well as specifying costs, the positives and benefits of delivering on such a plan should be specified. There is an element of that in the plan documents at the moment but it does not come out in the overall narrative as much as it could do, and it certainly should be used more in the wider engagement strategy. Obviously, that should include the economic benefits—indeed, there are some very good estimates of economic benefits in the plan—but it is equally important to stress the non-monetary benefits: improved health, improved lifestyle, not spending all your time in traffic queues and so on. It should also, as Kevin Anderson hinted at earlier, include the costs of inaction. There is one reference in the plan to the Office for Budget Responsibility report, but a lot more could be done to pull that out and include the narrative of what it would be like in 2040, 2045 and 2050 if we did nothing. What would living in Scotland be like if we did nothing? That would strengthen it.

I want to make one more point on your question, and that is about asking for more detail. In order to have the high-level figures that the Scottish Government has put in the plan, it must have the detail that we have been asking for. I completely accept that it cannot put in details that are held by the UK Government or others, but it could specify where the gaps are and which things the UK Government could better provide. As I say, it must have some of the detail that we have been talking about; otherwise, it could not have put together the high-level stuff that is in annex 3. There must be workings behind those figures.

Kevin Stewart: I am playing devil's advocate here, but I go back to the lack of delivery or folk not wanting a project to be delivered. You talked about the costs of inaction, but the people of Whitesands in Dumfries know that there is a flooding risk. They know the cost of inaction, yet many of them do not want that flood prevention scheme.

Lloyd Austin talked about the communications and not everything being monetary, but, for many folk at the moment, their lack of income and the struggle to pay electricity, gas and food bills is the top priority without a doubt. Money in their pooch is aa they think aboot.

I will come to Jess next.

Jess Pepper: It is interesting because I hear it said that folk are not talking about climate, but we often find that people are talking about climate but not framing it in the same way. People talk about it in different ways: folk are talking about food costs rising, energy in their homes and damp in their homes. Folk can get animated about waste, how they get about, and their future and their children's futures. All those things obviously relate to climate.

The Climate Café movement has been entirely organic. We realised in one community that, because of what folk were saying to each other about certain things, they might appreciate a space just to talk about it. We created that space, and it turns out that other communities liked the idea of having that space as well. The process has been completely organic. There has never been any promotion saying, "This is what you should do in your community;" it has just been community to community to community, with people thinking, "I can get involved in this chat."

Through observation and from sharing experience, we have learned that this is not a conversation that folk are used to having. It may be that something is bothering folk, they may be wondering what is happening, or they may have concerns about things like food prices rising and stuff that is happening in their own place, work setting or wherever. However, when folk share knowledge and understanding and get access to more information about what is happening—perhaps the science, the impacts, what solutions are out there, what is happening in their own community and what business leadership there is on their doorstep, for example—it animates the conversation so that folk get plugged into what is going on and ask, "What can I get involved in?"

What has also been completely organic is the switch to action. Folk want to know what they can do and what others are doing: what the Government and local authority are doing. Over 10

years, we have seen that folk are getting into conversations with their local government and with the senior management in their school—

11:00

Kevin Stewart: Can I stop you, Jess? I recognise all the work you have done and I recognise that folk have become engaged, but that is a very small number of people.

Jess Pepper: The most important thing is that this is not my work; it is folk saying, "We want to do the same thing." I appreciate that that is only some communities across Scotland and others who are interested in doing similar things, but people engaging in their own conversations in their own places, with their peers and with their friend groups is not unusual. The key thing out of the learning is that, once folk feel confident in the conversation, they become much more involved and want to focus on action.

That brings me to what you were saying about the plan. Forgive me if I am wrong, but certainly from my perspective we do not want anything more complicated—if anything, it should be simpler to understand. We are in an emergency, and the situation is complex. Lots of folk will need to have different roles and responsibilities, and lots of things will need to happen—some at the same time, and some will need to go ahead of each other. There are all those interrelationships, and there are layers that people can dig down deep into if they want to find out more about what is going on or get involved in something.

For example, I am hearing about a lot of interest with folk seeing what is happening in Europe with microsolar projects. Balconies may not be our thing, but in parts of Europe they are, and there is interest in having something that is very accessible to generate your own electricity. That sits right on the cusp of devolved and reserved responsibilities, so it would help to understand whether there is an option that could take some of the weight off the grid if it is done at scale across Scotland. Solar can work here, too, but where does it fit? Folk get interested in understanding where all the different things fit together. They want to dig into that—it might relate to their own passions and interests or experience as well.

If I am correct, it would help to have something that is structured simply and very accessible, transparent and clear in its language. Some of the numbers that Kevin Anderson is using might not be known to everybody, but they could be much more accessible if they were presented in a way that is manageable for people to understand. Communication is absolutely key.

We are not all having that conversation right now, but I would not necessarily assume that that is because there is no interest. The statistics that James Curran has shared suggest that people are passionate and want to see change in this area.

Dr Winskel: I agree with what you are saying, Mr Stewart. This is a more difficult time to be doing this work, and the issue is not top of the list for people. There is also a very active media that is looking to pick holes at every opportunity. There is an anti-net zero media that is ready to go every day with stories, and there is often miscommunication in how costs are presented. There was a recent report by the National Energy System Operator about the long-term benefits of transition. The *Daily Mail* had a story about how that will be so much more expensive, while other media were saying that it is to everyone's benefit in the long term.

When we talk about climate, we have to be very careful about how the issues are reported. I think that we all want to support the Government in this plan, and we want it to be the best plan it can be—

Kevin Stewart: You say that you are supportive of the plan—even though there has been a huge picking of holes in it in your evidence today—but you know what will be reported from this session today. Mr Austin has concentrated on agriculture. He basically wants everybody to eat less beef, other meat products and dairy. That will go down like a lead balloon with many folks, including many folks who cannot afford such things at the moment. There has been talk about a reduction in cars. I have no skin in the game—I am not a driver and never have been—but again that will be the thing that is reported. There will be the talk of putting in what folk see as very expensive heating solutions. Again, I have no skin in the game because I am already all electric, but you can see exactly where this goes.

In picking holes in the plan and not talking so much about the delivery that is required, each of you today has provided the headlines for the anti-climate change brigade, which has probably reduced energy and excitement among the folk who recognise that climate is an issue.

Dr Winskel: The reason why we pick holes is because we want to be confident and we want to support the plan. I want to be able to go out as an independent academic say that the plan is very well based.

That matters because, if we get this wrong, the headlines will be a lot worse. Northern Ireland ran into problems with its heat subsidies because it was a poorly designed policy mechanism. The UK Government promised incredible reductions in the cost of heat pumps that were not deliverable. It would be nice to think that they were, but if we do the analysis and we think there is no evidence for something, we do not have confidence in what is

being proposed—and there is a lot of money at stake.

It may seem a nerdy exercise, but it is the basis on which we can go out there, promote and support the plan, and enable things to happen.

Kevin Stewart: Convener, I will leave it there, but I will point out that, with flood risk management in Scotland, Professor Curran delivered his part of a plan that has not delivered on the ground, and my fear is that we get too exercised by the climate change plan rather than the delivery.

The Convener: We are out of time, but we still have questions to ask. I see that Kevin Anderson wants to come in. I said to the others at the start, but unfortunately I could not say to you remotely, that I cannot bring everyone in all of the time and I must try to balance bringing in witnesses with the need to bring in committee members. I will pass over to Mark Ruskell and then to Monica Lennon.

Mark Ruskell: I was waiting to hear what Kevin Anderson was going to say, but if we do not want to hear what he has to say, I will move on to the next question.

The Convener: I am sorry—I am in the most impossible situation.

Mark Ruskell: I understand, convener.

The Convener: Would you like to give up some of your questions to hear Kevin Anderson's response, or would you like to ask your questions?

Mark Ruskell: I am here to listen to the evidence, so I would like to hear a brief contribution from Kevin Anderson if he wants to make one, and I will move quickly on to a final question.

Professor Anderson: The point that the last questioner raised is absolutely key. Let us be clear: we are not all in this together. Whether it is reducing emissions or the impacts of climate change, equity and fairness—which are barely touched on in the plan—are absolutely essential.

I would argue that there is no cost of living crisis. We have a manufactured crisis, and it is a crisis of fairness and equity. The median household income in Scotland is £37,000. The average professor gets £85,000, an MSP £75,000, and the First Minister £182,000. We have about one third of Scottish households in fuel poverty. It is not their job to dip into their pockets to solve climate change. We need to recognise that they are locked into terrible houses, poor transport and lots of other bad infrastructure around them.

We have to move the resources that currently furnish the luxuries of people like me and, indeed, many of us here today, so that we can put the infrastructure in place—things such as retrofitting the poor-quality houses in Scotland and putting in place public transport systems. That would play out well for health for poorer communities and for employment, when we have 3.7 to 4 per cent of Scottish people unemployed. There are plenty of opportunities for jobs, but that means moving the resources from those of us who have done disproportionately well out of the current system—the resources, labour and finance—across to that infrastructure, which will help everyone.

If we try to sell the message that we are all in this together and ask the significant number of households that are struggling today to dip into their pockets, they will have other priorities—quite rightly so. If we recognise that we are not in this together and we start to see fairness and equity as a key part, it opens up many more ways to look at the situation.

Most emissions are discretionary. We have scientific evidence to show that the top households use five times more energy than the lower income households. Unless we are prepared to open that equity box, which most of us who are quite wealthy are unprepared to do, we will go on with this manufactured cost of living crisis, and we will not be able to respond to climate change in any reasonable timeframe.

Mark Ruskell: I will be reading about that in the *Daily Mail*.

My final question is on contingency measures, which Mark Winskel mentioned earlier in relation to carbon capture and storage and the Acorn project. Three or four years ago, the UK Climate Change Committee warned that the Scottish Government needed to have a plan B on Acorn. There is very high dependency on negative emissions technologies, particularly in the third carbon budget. How should the plan deal with the question of contingency? Should there be trigger points in there?

It feels as though, between one climate change plan and the next, any decision on reliance on the gas grid—for example, for heating or for carbon capture and storage—has been put off. It feels as though many of those dependencies just sit there. Perhaps a contingency measure needs to be brought in, or a trigger point at which Governments have to either make a decision or say, "You know what? This is not going to happen, therefore we need to go to plan B."

I will bring in Mark Winskel, but if anybody has something to add on the back of what he says they should indicate that they wish to come in.

Dr Winskel: They are a little bit different in my mind, but we do need contingencies for many of those areas.

It might sound a bit like dancing on the head of a pin, but the question about CCS that has come

up today is a serious one. The Scottish cluster appears in the CCC's own analysis. It is expected to be online quite soon. More money—much more than ever before—is going into industrial clustering at both Government levels, so the future might not look like the past in terms of the track record for CCS. This is the time to get serious about CCS if it is to be a significant contributor, bearing in mind all the concerns about our industrial future and heavy industry in Scotland.

Contingencies matter, but they need to be thought through systematically. What if we do not get CCS? Where could the shortfall be made up? Which sectors could make up such shortfalls? It is quite hard to see the answers here, in my view. People might say that although a lot is going on here we could go a lot faster in some sectors, but that is not addressed. Trigger points—the points at which we would say, "We are pulling CCS; it is no longer feasible"—would depend on how things go with the cluster investments. The two leading clusters are not in Scotland. We need to see whether that approach can work economically and what role there is for hydrogen.

There are no absolute answers to those questions. The CCC has changed its mind a lot about aspects such as NETS and CCS. That is healthy, because the evidence changes and the relative costs of different options change all the time, so we just need to allow that to happen. Some things need an earlier look than others, because if we are to get anywhere by 2040—this is a 15-year plan—CCS has to start happening in the next few years.

Mark Ruskell: I understand. Thank you.

I invite Lloyd Austin to respond briefly.

Lloyd Austin: I agree about the importance of any plan like this having associated with it a complete programme management system that identifies interdependencies and contingencies. The monitoring process should have indicators such that when a certain point is reached you bring in one of the contingencies.

That leads to two further points. One is that delivery is key, as Mr Stewart mentioned. James Curran and the Climate Emergency Response Group have made good, positive recommendations on delivery mechanisms and the governance aspects associated with converting any plan into action. Those include aspects such as programme management and contingencies.

11:15

On the specifics of CCS and NETS, I have already made clear our views on overreliance in the draft plan, but Mark Ruskell also mentioned having a plan B. One way of addressing such overreliance would be to have a contingency and a plan B. I remind members that, five years ago, the Parliament's Environment, Climate Change and Land Reform Committee proposed having a plan B as one of the 166 recommendations it made in response to the CCPU. I very much hope that a similar recommendation could be made in response to the current draft plan and that such a plan B would include an explanation of the point that would trigger its implementation in place of plan A.

The Convener: We come to questions from Monica Lennon, who is joining us online.

Monica Lennon (Central Scotland) (Lab): I am very conscious of the time pressures this morning, but I want to pick up on an issue that our witnesses—in particular, Jess Pepper—have mentioned, which is whether the plan needs to be clearer on the governance and accountability arrangements that support it.

I know that time is precious, but I am keen to hear from our other witnesses whether they agree or disagree with Jess on that and also to hear from her what exactly needs to change. Jess, you mentioned the structure of the climate change plan and how it could be improved. Could you give a few examples on that? Does the Government have the skills and knowledge to do that, or does it need to engage with outside help?

I will come to Jess first and then maybe we could hear from others who want to comment on this theme.

Jess Pepper: I was suggesting that the structure and layout of the plan could be clearer and more accessible. I have been checking with the Climate Café network, in which voices from communities across Scotland share their views. In the chats that it has been able to have so far, it is hearing folk's concern about accountability and accessibility coming through strongly. It is about their being able to see, with clarity, what the different sections are, how they relate to other things that are going on and who will lead on those matters. The infographics in the plan suggest timelines by which things will be done, but it is not always clear how they will be done and what the timing should be.

A lot of the time, if people are on the outside of the Government institution, or they are not in the swim of the Parliament, they do not necessarily know what is coming or when they might be able to get involved, participate, share their experiences and inform the system so that it can be stronger. If that could be set out more clearly, it would really help. It is not necessarily that information is missing. A lot of ambition will come from new stuff. If we were to go back and look at

what communities said in the big climate conversation in the summer of 2019 we would find a lot in there that folk are still saying now. We could be figuring out where something fits, whether it is additional or whether somebody is delivering it already.

There is so much scope for collaboration here. It is good to read in the cabinet secretary's opening statement in the introduction about the ambition, the spirit of collaboration and the opportunities for discussion. However, sometimes we find a bit of an operating gap between such sentiments and how things are delivered. The plan has alluded to how local authorities or individuals on the ground, in their own communities, might be doing their thing and contributing through whatever their roles in life might be. However, we could ask exactly how people will be involved. Do they need to read about it in this dense document or will there be a process that involves them further?

We heard earlier that there was some discussion about what people had aspirations for in the plan, and I saw those mentioned in the committee's call for views. We talked a bit about the dashboard idea. I am hearing from folk in their own places echoes of themes that they already have in their own chats. They would like to understand what is happening on their topics of interest. You will find that those conversations are unique, so folk will have different priorities at that time. They will want to go in search of what is going on in relation to those priorities, to be reassured about it and to have confidence that progress is being made.

I think we will hear a lot of this coming out in the next few months, in the run-up to the election, with folk wanting to know a bit more about what is happening in particular areas. For example, I am hearing about a lot of plans for hustings, which is really interesting and would be new in this space. They have happened before, but this time there would be community-led hustings across the country.

Monica Lennon: Jess, I will just come back in for a moment. That is all really helpful. I look forward to those hustings, and I hope that I will get an invite.

What I am hearing is that, aside from people rightly wanting information—it is encouraging that they want to be involved and play their part—and the need to improve the plan's presentation and ensure that we have the right balance of infographics and so on, there is still a question mark about where responsibility lies on many of the system changes that we need to see. Does the Government need to be clearer about who is responsible and taking the leadership role in certain sectors and on certain actions? If we can get those points made more clearly, that is when accountability and transparency can work more effectively.

I see that Jess Pepper is nodding; it may be that others are, too. I ask Jess to respond briefly, then I will bring in the rest of the panel.

Jess Pepper: That is absolutely the case. We just need that clarity right there, but we also need clarity on the processes to support, develop and deliver. Delivery will be key, and we need to know how that will happen. There is something about it being live. We need to know if that delivery is not happening so that we do not find that out in five years' time and then think that we could have seen that and helped, contributed and informed. There is so much learning across the country, in terms of all sorts of leadership that is informing other parts of the world, yet we are not necessarily employing that approach ourselves. [*Interruption*.]

I am sorry. I am being told to be quiet, and that is quite right.

The Convener: You are not being told to be quiet; you are being asked to keep it short. We are nearly 30 minutes late for the next panel.

Jess Pepper: Absolutely. I respect that.

The Convener: That puts me in a very difficult situation.

Jess Pepper: I apologise.

The Convener: I know that you all want to come in, and Monica Lennon will want to hear answers—as we all do—but a couple of sentences will do it for me. I am sorry to be difficult, but I must be mindful of the other witnesses.

We have Lloyd Austin, James Curran and Mark Winskel wanting to come in and, somewhere in the background, I suspect that Kevin Anderson does, too. I ask you to keep to a couple of sentences each, please.

Lloyd Austin: On changes to the plan, we would like to see more detail in the modelling and also disaggregation of the emissions calculations so we can really see and assess their credibility.

We would like to see strengthened actions on the types of issues that we have touched on before. I would particularly like to see the governance and delivery mechanisms strengthened, including a having programme management approach that sets out on a Gantt chart-type system who is to do what, when, where, with what money and so on. That would help to deliver on the issues that you have just flagged up about clarity on who is to do what.

The Convener: There was liberal use of punctuation there. That was about five or six sentences. [*Laughter*.]

I will move on to James Curran. I am sorry. I have to do this. I hate doing it more than anything else in the world, but I have no option.

Professor Curran: I get it. I think that I can give my answer in one sentence. I agree about all the complexity, but we also want simplicity to make the plan approachable. Members might know it already, but I would take a look at the Glasgow City Council's "Glasgow's Climate Plan 2026-2030", which is on the web. To me, that is a model of good portrayal of a climate plan.

Dr Winskel: What should I say? There is reference to co-benefits here, and the Edinburgh Climate Change Institute has done interesting work done on those that could be featured more significantly and which have been costed.

If I were working for a local authority I would not know quite where my responsibilities lie on this. That is incredibly important for aspects such as heating, so it is a very difficult situation. Actions that follow from the plan need to be attributed. However, this is all underpinned by a pyramid of factors. If the good granular analysis is there, the sectoral confidence that comes from that analysis will be there, the priorities for spend will all be there, and then we can go out and confidently sell the plan across the country. Those things all depend on one another.

The Convener: A bit like Lloyd Austin, your use of punctuation there was good.

Kevin Anderson, do you want to come in?

Professor Anderson: The plan needs to be layered and use appropriate language so that, if they want to delve deeper, people can move into reading the more expert language. However, there should be a simple summary right at the beginning.

Secondly—perhaps we can find some other word for this—what should be the punishment for people who do not deliver what they are tasked with delivering? There must be something. They cannot just fail and there will be no comeback on it. There must be some mechanism by which we deal with failure so that people know in advance what that will be.

The Convener: Monica, have you a brief follow-up for anyone in particular?

Monica Lennon: Yes, convener. I will make this my final question. I will leave aside the issues about communication with the public, because those have been covered throughout our discussion.

Kevin Anderson and Lloyd Austin have mentioned our on-going relationship with oil and gas. I was reminded that, back in 2021, the Beyond Oil and Gas Alliance was launched in Glasgow during the 26th United Nations climate change conference of the parties. At that time, the Scottish Government stated that it was in active discussions about joining it. I have asked several parliamentary questions about that, but it seems that there have been no developments. Given what Kevin Anderson and Lloyd Austin have said about the importance of phasing out oil and gas production in a managed way, through a just transition, does it matter that Scotland has not joined the Beyond Oil and Gas Alliance? What is the significance of that, or does leaving that question hanging there send out mixed signals about the Scottish Government's position?

I ask Kevin Anderson and Lloyd Austin to answer briefly.

Professor Anderson: In which order?

The Convener: Kevin Anderson and then Lloyd Austin.

Professor Anderson: That point is well taken. Scotland should have joined the BOGA initiative, not least because it would be one of the few so-called developed countries that is starting to drive that agenda. Its influence within BOGA is very important.

Lloyd Austin: I reiterate what I said earlier about oil and gas. The plan is very silent on that; it should say more.

I agree with Kevin Anderson about the Beyond Oil and Gas Alliance. The other international initiatives and partnerships that the Scottish Government could get into could be very valuable, too. I suggest the Fossil Fuel Non-Proliferation Treaty Initiative, which concerns another mechanism that is on-going in the international debate. Although all the international aspects of the Scottish Government's work are creditable and should be encouraged, and it can do more, that must be matched by delivering at home otherwise its credibility in the international fora will be undermined. Delivering at home is equally important.

The Convener: Okay. Thank you.

Monica, I am afraid we are almost out of time in this session. I want to ask one very simple question, which should elicit a yes, no or don't know answer. Is this a good draft climate change plan? I will come to Lloyd Austin first.

Lloyd Austin: It is a start.

The Convener: That is none of the three answers that I mentioned. [*Laughter*.] Let us see whether James Curran can improve on that.

Professor Curran: It is a good draft.

Dr Winskel: Unfortunately, it is not a good draft. I have to be honest.

Jess Pepper: There is work to be done.

The Convener: Kevin Anderson, you get the final say. Yes, no, or don't know?

Professor Anderson: No.

The Convener: Thank you. I thought that I could rely on you to give a definitive answer.

I thank everyone very much for their evidence this morning. It has been a challenge for me to try to get all the answers in on time. I am sorry if you feel that you have not had the opportunity to contribute fully, but we have had already longer than we anticipated.

I suspend the meeting briefly, until 11.35 am. I again thank our witnesses for their evidence. I hope that you all have a good Christmas.

11:29

Meeting suspended.

11:35

On resuming—

The Convener: Welcome back to the meeting, and we continue our consideration of the Scottish Government's draft climate change plan with a panel focusing on electric vehicles and charging networks.

I welcome Philip Gomm, head of internal communications, RAC Foundation; Andy Poole, head of environmental policy, Society of Motor Manufacturers and Traders; and Jarrod Birch, head of policy, ChargeUK. I believe that Professor Jillian Anable, chair in transport and energy at the institute for transport studies at the University of Leeds, will be joining us, too.

We will go straight to questions, but first of all, I apologise for the delay in getting to you. We were struggling with a lot of evidence from the previous panel, and I am putting it down to my failure to keep people on time. I might be a bit harder on this panel, given the time pressures.

I get the easy question to start with, and I ask everyone giving evidence to answer this briefly: are the proposals and policies set out in the draft climate change plan—that is, to phase out petrol and diesel cars by 2030—sufficient to deliver the Scottish Government's overarching goals for electric vehicle uptake? What do you think? I will bring in Philip Gomm to start with.

Philip Gomm (RAC Foundation): Good morning. I should say that I am head of internal and external communications at the RAC Foundation. We are a small body, so I do both things. Sometimes I even make the tea.

With regard to dates, particularly the 2030 ban on the sale of new petrol and diesel cars, it is all about having consistency and certainty. If there is one direction that I am coming from, it is from the consumer side, and in that respect, I would say that, if I am making a decision on what is probably the second biggest purchase that a household makes after a house, I will want to know what the landscape will be, what will be available to me, where I can use the product that I buy, and what I might get for it if and when I want to sell it on. The changing of dates and policies will delay and influence my decisions.

When the RAC Foundation did some work recently on the average age of cars, it found that, in the UK, it now stands at almost 10 years. Therefore, if I delay a purchasing decision even by a year or two, or if I decide to go with petrol or diesel in a shifting landscape, the vehicle that I am buying now will be on the road until at least 2038, 2039 or probably 2040 and beyond. Therefore, anything that changes or undermines my decision-making process is, I think, regrettable.

Andy Poole (Society of Motor Manufacturers and Traders): Hello, everybody. I think that there is a lot to like in the plan. However, there is a lack of detail, too, and I make that point in the context of some very strict regulated targets that we have for delivering electric vehicles in our industry. At a UK level, those targets remain incredibly challenging, and we are doing everything that we can to meet the challenge.

As for the plan to bring forward the dates for the end of sale and to increase the transition relative to the rest of the UK market and, indeed, some of the international markets in which we play, we would need to see significant detail on how that gap will be filled. I do not see that sort of thing at the moment, but I look forward to seeing it develop in the future.

Jarrod Birch (ChargeUK): Good morning. From an EV charging perspective, I would say that three things jump out of the plan. First, the plan is clear-eyed about the role of EV charging in hitting the quite ambitious emissions reduction targets that others have talked about already and sees the roll-out of a public charging network as a crucial part of that. That is exactly how we see our role in working very closely with drivers and auto makers.

Secondly, I would note the target in the plan of having 24,000 additional public charge points in Scotland by 2030, which is both punchy and ambitious. I would argue that that would be plausible, if the conditions were right, but currently they are not, for various reasons, whether they be the difficulties of getting grid connections, energy costs or, as Philip Gomm was talking about, certainty about the long-term direction of the

transition. I am sure that we will come on to discuss those things in due course.

Thirdly, the important thing for Scotland, specifically, is that the plan rightly recognises that, with the phasing out of ChargePlace Scotland and the move to a private sector-led roll-out of charging in Scotland, the public sector will still have quite an important role in that respect, particularly in filling gaps in provision where the commercial case is weak—for example, in rural and island communities. All in all, it is a reasonable plan, but the charging side of things will not happen automatically.

The Convener: The zero emissions vehicle mandate and associated vehicle emissions trading schemes are pretty key elements in the Scottish Government's plans for electric vehicle uptake. Are those schemes or programmes effective? I will take it in the same order and come to Philip Gomm first.

Philip Gomm: With regard to some of the Scottish Government's ambitions, it is clear from the plan that it is very reliant on what is happening at a UK level. I think that, once people are presented with a plan and are told that they need to meet a target by such and such a date, those in the industry in particular—Andy Poole can speak for himself on this—will do it if it is commercially possible; after all, they want to stay in business and sell cars, and they make their investment decisions based on the policy landscape in front of them.

With products that take a long time to develop and have a long useful life, the trouble for consumers and business arises when the dates change—or, indeed, when there is even talk of change. We might have been disappointed, or confused, by the way in which Rachel Reeves and the Labour Government trailed some of the things that were going to be in the budget and then were not in the budget. It is perhaps a similar thing with the policy on electric vehicles. Are they, or are they not, going to do this? If there is any doubt at all, people will vote with their wallets by not getting them out of their pockets.

The Convener: Andy, do you want to add anything? Certainty—or, at least, directional certainty—seems to be required.

Andy Poole: Certainty of regulation, rather than uncertainty, is very welcome. I think that, as a general rule, no regulation on its own will be enough to deliver this; manufacturers are doing everything that they can to meet the targets, and there are some flexibilities built into the vehicle emissions trading scheme to allow them to do that, particularly in the shorter term. At the moment, though, it is incredibly expensive, and it is a question of not just meeting those targets and driving the industry towards electric vehicles, but doing that while maintaining competitiveness at the same time.

As I have said, it is very expensive, and delivering on this, and ensuring the success of the ZEV mandate, very much rely on the enabling ecosystem, the support for consumers, the infrastructure investment and the ability to move forward at the right pace. The current flexibilities are absolutely vital, because we are running about a year behind where we need to be with the ZEV mandate. The only way in which we can fill that gap is to persuade more consumers to take up these vehicles, and you cannot do that through regulation.

11:45

The Convener: Okay. Jarrod Birch, do you want to add anything briefly to that, or are you in agreement?

Jarrod Birch: I will say briefly from a charging perspective that the ZEV mandate is the critical thing that tells us what to invest and when. It tells us how many EV drivers that we can expect, where they will be and when they will be there. Without a clear direction of travel, and without stability and certainty in that mandate, we cannot invest in infrastructure, because we invest several years ahead of the mandate to ensure that we are ready. From that perspective, the mandate is very important to us.

The Convener: Thank you. I see that Jillian Anable has now managed to join us—there must have been some gremlin in the system that stopped you getting in, Jillian, but you are now here. You are not going to get a chance to answer the first two questions, but I am sure that other members will bring you in.

We will now move straight to Mark Ruskell for his questions.

Mark Ruskell: I want to ask about consumer incentives to encourage uptake of EVs. Specifically, what evidence is there of incentives that have worked in the UK or further afield? Have you any thoughts about the costings? Would Philip Gomm like to answer first?

Philip Gomm: I missed the first part of your question, but I think—

Mark Ruskell: It was about which consumer incentives work and the costs of them.

Philip Gomm: I come back to the issue of consistency with incentives. People need to know what is available and for how long something will probably be available. When you purchase a car or, indeed, any product, you want to know the financial landscape around the purchase of that

product and you want to have some sense of not only what it will cost but how much it will cost to use. Perhaps we will come on to discuss the electric vehicle excise duty, which the current Government has proposed.

If the financial goalposts change, household budgets are thrown into chaos and confusion. Of course, if you spend in one area, you cannot spend that money in another. Financial incentives are fine but, just as businesses have their business plans, households have their business models and budgetary plans, which are finely tuned and perhaps do not include a great deal of flexibility. Therefore, we want all schemes and proposals to ensure certainty and consistency.

Mark Ruskell: Jillian Anable, would you like to come in on consumer incentives?

Professor Jillian Anable (University of Leeds): I apologise for being late. I was here for some of the previous evidence session, but then I got booted out.

I have a few things to say about incentives. First, it is important to recognise that, so far, the vast majority of the electric vehicles that have come into the market have done so through fleets. With this topic, we get caught up in thinking about what we can do for private consumers, and it is worth bearing in mind that we have not tried very hard to do anything so far.

Secondly, it is important to recognise that we often point to Norway when we think about examples of best practice globally. There are all kinds of reasons why Norway is not a good comparator, but I like to stress that one of the main ways in which Norway has achieved what it has done has been by disincentivising internal combustion engine vehicles, which it has been doing for a very long time. There was a huge purchase tax on ICE vehicles so, when EVs were introduced, it was not necessary to tax them as much. That is important because, when we think about incentives, we also have to think about how we disincentivise what we do not want people to purchase. We could talk a lot about the detail in that regard, but I am just trying to ensure that I put across the main point.

Thirdly, to accelerate uptake of EVs, we must stimulate the second-hand market. There can be innovation and creativity in relation to incentivisation, including by providing lease schemes, interest-free loans and so on that are specifically targeted at the second-hand market.

Those are my main points to concentrate the mind and ensure that we do not think too narrowly about the subject.

Mark Ruskell: I will ask Andy Poole the same question. What excites customers when they come in to look at EV models?

Andy Poole: Customers tend to like the experience of driving EVs. We need to consider the cost of buying an EV, as a new product, and the total cost of ownership. On the up-front cost, we welcome the electric car grant that has been introduced. That will help, although it is not available for every model—it is available only for about a quarter of EV models on the market at the moment. On the total cost of ownership, it is critical that we get the tax system right. The employee car ownership scheme and beneficial VED and company car tax rates are all critical. All that combines, along with infrastructure investment, to give consumers a consistent signal over time. As you can see from some of our figures, the parts of the world that have moved ahead provide a broad spectrum of incentives throughout the life of the vehicle, rather than relying on just one.

Mark Ruskell: What are your thoughts on stimulating the second-hand market, as Jillian Anable said? Will we reach a point, perhaps in five or 10 years' time, when there will need to be a large amount of battery repowering for the EVs that are being sold today? Is there a way to incentivise that?

Andy Poole: The health of the second-hand market is dependent on having a really healthy new car market, so that, as new models with improved technologies filter through, there are lower prices. On battery ranges, in most cases, the VETS requires that batteries have a seven or eight-year life cycle guarantee or lifetime guarantee. The batteries are lasting for longer than we had perhaps thought. Not that many of them have come to the end of their lives yet, but all the early indications are that they last for a pretty long time. However, we still need to look at the data for the few electric vehicles that have come through the market. Very few electric vehicles are approaching the end of their natural battery life at the moment, so the data is still being considered, but all the early indications are that the batteries last for an incredibly long time.

Mark Ruskell: Jarrod Birch, do you have any comments to add?

Jarrod Birch: Andy Poole made one of the comments that I was going to make, which is that the batteries are lasting for much longer than we had originally anticipated. There is a lot of data in the UK and more broadly that shows that the batteries are doing very well compared with our expectations.

We now see schemes in which purchasers of second-hand vehicles can have the battery

checked as part of an accredited scheme. Before people buy a second-hand vehicle, they can check that the battery is in good nick and that the vehicle is attractive enough to pick up and drive. We hear from drivers that that is really helpful information to have.

Mark Ruskell: Thank you.

Douglas Lumsden: We have been hearing about electric cars so far, but what more can the Scottish Government do to support and incentivise the switch to electric vans and heavy goods vehicles?

Philip Gomm: That is an important question, because it is very easy to concentrate on and demonise people who drive petrol and diesel cars without considering where emissions come from overall and what sort of vehicles are driven in what sort of places. Before the meeting, I was looking at the transport mix in Glasgow, for example, where 19 per cent of the traffic mileage is done by vans. Given that the vast majority of vans are diesel powered, if you are concerned about electrifying the fleet and about air quality, it makes sense to target those vehicles in some form.

Jillian Anable is right that that can be done in a number of ways. You can disincentivise the use of diesel vans or cars in towns and cities, although that comes at the risk of penalising small businesses and people on lower incomes, who tend to drive older cars. If you are looking to provide incentives, you can target them at specific sectors and encourage research into the development of technologies that will help to alleviate the problems from the sorts of technologies that are causing the particular problem—I am thinking of taxis, vans, buses, lorries and so on in urban areas. Given that up to 70 per cent of people in Scotland live in the central belt, which is a predominantly urban area, that is perhaps where some of the interventions and incentives should be targeted.

Douglas Lumsden: We heard from the Climate Change Committee that it does not think that hydrogen will be part of the solution as we go forward. Do you have a view on that?

Philip Gomm: I do not have a huge view. Given where we are, in the short to medium term, from a customer, consumer and retail point of view, we are looking at electric battery-powered cars and vans. It remains to be seen whether hydrogen can be used at a larger scale at a later date and whether the infrastructure can be put in place. That might be depot and sector led.

Douglas Lumsden: Andy Poole, how can we make the switch in relation to vans and HGVs?

Andy Poole: That is a good question. Uptake of electric HGVs is nascent compared with the car and van market. Electric HGVs account for less than 1 per cent of the market at the moment. The key difference with HGVs is less about the up-front cost; a business must make a decision based on the whole-life deliverability of a vehicle and the cost to the business over its whole life. That includes some pretty key decisions about logistics, the cost of the vehicle and its ability to do the job in a way that competes with its ICE equivalent, of which there are still many on the road. Until that business case is made and it can be shown that things can be done more quickly and better, we will struggle to get uptake.

Infrastructure is important. We have talked about the progress that Scotland is making in rolling out charging infrastructure, but there is the issue of quality, too. The right spaces and the right power levels are needed to provide HGVs—bigger vehicles—with a practical charging solution.

The business case is complicated. Such trucks need to be able to compete with their equivalent ICE vehicles in relation to space, distance and the cost of charging, which is still very expensive relatively. We face all sorts of combined challenges with the shift regarding HGVs.

Douglas Lumsden: Jarrod Birch, do you have a view on how we should tackle the issue with HGVs in the future?

Jarrod Birch: I do not disagree with what Andy Poole said. In my view, the problem is very similar to the chicken-and-egg problem that we had with passenger vehicles 10 or 15 years ago, although it might be even bigger if that is possible. As he alluded to, such vehicles are often more expensive and the infrastructure to charge them requires much more land and much more power. We have such challenges with passenger vehicles already, but the problems are much bigger for HGVs.

We end up in a vicious cycle in which people do not want to decarbonise their fleets because the business case does not stack up and investment in charging infrastructure is not made because there is not as much demand as we would hope to make the investment worth while. We need to find a way to break that deadlock and deal with the chicken-and-egg or catch-22 situation in order to get that market off the ground, because, as Andy Poole said, it is nascent as it stands.

The Convener: I have a quick question. Some hauliers that I have visited say that they just cannot make electric HGVs work for them because, by the time that the lorry has come in and recharged, it could have been out and done another six or seven hours of work. However, it has sat there recharging. Those hauliers do not have flexibility to allow for that. Are we ever going to get round that in the short term? I will bring in Andy Poole on that.

12:00

Andy Poole: The technology is improving. Every manufacturer has invested and now has electric HGVs and other technologies. The technological approach to HGVs is still much more uncertain. There is a huge focus on electrification for smaller vehicles. I appreciate the Climate Change Committee's position on the issue, but different technologies might fill certain roles in HGV and freight. There is huge cross-border traffic. Many vehicles go cross-border into other markets in Europe and struggle with that.

That is a challenge, but the technology is coming, and we are providing those big trucks. It will be important to have the outcomes of some of the ZEHID—zero-emission HGV and infrastructure demonstrator—trials that are going on to see which technologies are most appropriate in which circumstances. We are still waiting for the outcomes of those.

The Convener: From what I have heard, they are more expensive and they can do fewer runs, so hauliers are not keen on them.

Kevin Stewart wants to follow up on that.

Kevin Stewart: Andy Poole said that he was not quite convinced about some aspects of the Climate Change Committee position. I take it that the not convinced bit includes hydrogen. Other countries are looking at hydrogen for HGV use and say that it is much better than electric vehicles. Does that need more exploration in these islands, as is happening in China, Germany and the United States?

Andy Poole: Our manufacturers are building trucks for a global market and many markets are taking different approaches to the technologies that they are pushing. We have solutions coming in: we have electric trucks and hydrogen trucks on the market, as well as alternatively fuelled trucks. As the manufacturers, we are producing the range of technologies.

On the uptake of the market, we have always said that we want the appropriate solution to be market led and for the market to tell us which is the most appropriate, but that has implications for investment in infrastructure. I know that the Climate Change Committee's position is that we should focus on getting charging infrastructure rolled out and not diluting across different technologies, but our position is that the market will tell us which technologies it wants, and we have solutions in each area.

Kevin Stewart: But the market might make its decisions based on the fact that there are not many hydrogen refuelling stations at the moment. There are only three in Scotland, two of which are in Aberdeen and were out of action for a little bit. That in itself would have an impact, would it not?

Andy Poole: It would. At the moment, there are very few hydrogen charging stations around the country, as you said. There is not a lot of electric charging for HGVs around the country, relatively—[*Inaudible*.]

Kevin Stewart: Sorry. I think that you were cut off there.

Unless anybody else wants to come in on that, I will hand back to you, convener.

The Convener: I will hand straight back to Douglas Lumsden, because we all jumped in on his question.

Douglas Lumsden: Scottish Government research found that 56 per cent of drivers still do not intend to purchase an electric vehicle due to concerns over access to charging, high up-front costs and range anxiety. This is a question that we have had for a long time, but how can those concerns be overcome?

Professor Anable: Unusually for me, I will start with a positive and work towards some of the challenges. When we see that figure of 56 per cent, we do not need to be too alarmed, in as much as we do not need everybody to buy electric vehicles tomorrow. We need to get the issue into perspective, understand what the next part of the market is and target that. As much as we still have quite a lot of work to do in this plan to understand how to make the transition much more equitable than it is at the moment, we are still in a situation where, for many people who have the ability to charge at home, electric vehicles are cheaper to run, and that is still the case with the 3p per mile charge that was introduced in the budget. There is still momentum and it is possible to accelerate that in the parts of the market that can still benefit from electric vehicles, as long as the work on charging infrastructure maintains the momentum.

The bigger worry, which we have not really begun to acknowledge, is about what happens in five to 10 years when we are trying to get into the mainstream market, and particularly people who have problems charging at home. There are huge discrepancies in the cost of running an electric vehicle, depending on whether you can charge at home. By comparison, it is cheaper to run an internal combustion engine vehicle—much cheaper in many cases. We almost could not have designed a less just transition if we tried, given the haves and have nots in that regard. It is an absolute priority to understand how we provide residential charging solutions for people who lack the ability to charge at home. We need to do that now and start to roll out those solutions. The next swathe of consumers needs to see that starting to happen now.

Douglas Lumsden: I agree. There seems to be huge inequality given that, if you can charge at home, it costs 8.5p per kilowatt hour but public charging can be six times more. We had a discussion about that last week in Parliament. If you are fortunate enough to have your own driveway, it is cheaper to have an EV. If you are not fortunate enough to have your own driveway, you will pay considerably more. I am trying to understand how we can tackle that. Is there a way of making public charging cheaper? Who would put public chargers in place if we have some sort of price cap and they will probably not make as much money? I am trying to understand how we can fix that problem.

Professor Anable: The subsidies that we are putting into the system, including some of the incentivisation schemes for uptake as well as the subsidies that we are putting into the charging network, are not being targeted sufficiently towards the people who do not have off-street charging capacity and cannot afford to buy the cars in the first place. There are examples of social leasing schemes on the continent—in France and I think that they are starting to be introduced in Germany—that deliberately target lower-income people in areas that are more car dependent. There is a geographical assessment of where the lower-income people are and where the most car dependency is because of the distances involved or the lack of alternatives. There is then targeting of the social loan schemes, for instance.

I do not see that even being hinted at. I appreciate that there is still language around the detail of some of the incentivisation schemes, grant schemes and so on and about putting flesh on the bones. However, I do not even see that idea of targeting and thinking a little further ahead about how to get the next group of people in five to 10 years to keep the momentum going on uptake.

Douglas Lumsden: Does anybody else want to come in briefly on how we solve that inequality?

Philip Gomm: There is an issue with making electric vehicles available to everyone, because of the lack of off-street parking, as Jillian Anable has alluded to. About 63 per cent of Scottish households have or have the potential for off-street parking, which means that almost 40 per cent do not and so would be reliant on on-street charging or public charge points. In the longer term, you will struggle to make home charging available and convenient to all—that issue will always be with you.

Jillian Anable is right that, at this stage, you do not need everybody to want to have an electric car. You need to make sure that the people who have an electric car enjoy the experience and find it satisfactory in budgetary terms. Last year, we did some work on the availability of mobile phone signals at charge points, which found that it was not comprehensive. When you go to a petrol station, you know that you will get fuel. As it stands, when you go to a charge point, you do not know whether you will be able to connect to the app that you need to access that charge point. The charging experience does not just have to be relatively cheap; it also has to be available and reliable. If the people who do not want to buy electric cars at the moment talk to somebody who has bought an electric car and their experience is bad, that sets back the transition that you are looking to achieve.

We have had a lot of discussion about electric cars in urban areas but, arguably, in Scotland, you could promote electric car take-up in remote areas. One thing that is quite often available in remote areas is off-street parking, and the distances that people have to travel to petrol and diesel forecourts can be considerable, although I recognise that those are often associated with local facilities such as a shop. If you are looking to make the transition to EVs in the long term, perhaps one of the areas where you should start pushing is in rural areas.

The Convener: Thanks very much, Douglas. I think that Bob has a question.

Bob Doris: Yes, thank you, convener. My question is quite similar to Douglas's. We were just considering the short and long-term cost implications of a rapid switch to electric vehicles. That concerns individuals, businesses and the taxpayer, but I will focus on individuals. If I have this right, by 2035, manufacturers will, I hope, no longer be making combustion-engine cars and the switch will be complete. Effectively, during the next 10 years, consumers will be making financial decisions on buying a new car or a second-hand car. They might be tied into one more finance deal—for example, if they are not buying a car outright, and most folk do not. After that, they have to make the switch and that is that. Not everyone has to do it quickly, but the window for doing so is closing.

What are the cost implications of that for individuals? There is no point in saying, "Oh—it's costly. That's an issue". I am thinking more about how Government works in partnership with the financial sector to make it affordable, given that—let us be honest about it, convener—the sector will continue to make a fortune out of financing and refinancing cars, as it currently does.

I will give an illustrative example. I am a non-driver. The person who gives me a lift drives an MG. It is a family car and is not electric. MG's cheapest electric model starts from £19,000 and hurtles up to around £55,000, depending on the car that you get. A second-hand equivalent is

around £8,000 or £9,000, which is a dramatic contrast.

How do we quantify the short and long-term costs to the individual of making that switch? More important, how do we get partners in the financial sector and others to bring in products that do not price gouge consumers who have to switch and to get them to work in partnership to give a good deal to those who have no choice but to make a switch by 2035?

Sorry for the length of the question. That captures everything that I want to get more information on, so I might not need to come back in, depending on the answers. Who would like to pick up the cudgels of that initially?

12:15

The Convener: The danger is that, if all of the witnesses look away and do not put up their hands, I will nominate somebody.

Bob Doris: Andy Poole was kind enough to wave, convener.

The Convener: Oh—I missed that. Off you go, Andy.

Andy Poole: It is an interesting point. You said that consumers "have to make the switch". The challenge is ensuring that they do not get to that point—we do not want them holding on to their petrol and diesel for longer than they would otherwise. To enable that, we need to give them an alternative so that they can take that decision. It is worth stating that the carbon saving of the zero-emission vehicle and the VETS mandates depends on customers giving up their ICE vehicles rather than holding on to them.

I think that there are 160 EV models on the market, which is far more than there were a year or two ago. Their prices are falling over time, and we expect them to continue to fall. We expect the up-front costs of the car to come down.

Another aspect is the signals that you give to consumers on the cost of charging, which is still a key issue, particularly when consumers roll up to the visible charging stations at motorway service stations and see prices of 80p or 90p per kilowatt hour, which is not ideal. That paints a picture for them.

Various innovative ownership models are coming to the fore. The way that people buy their vehicles up front is changing, with far fewer people buying a car outright, and, as I said, there are hugely important schemes such as the electric employee car ownership schemes that really help with that side of things.

There is a combination of things, but I wanted to raise the point that consumers are not being forced to make the switch. We need to persuade them out of ICE vehicles and give them a viable alternative. However, there will be more EV models and they will be cheaper.

Bob Doris: Thank you. I hope that others will come in and take up the challenge.

Let me clarify my language. People are not being forced to make a switch now. However, if we fast forward 10 years and the only relatively new car that you can buy is an EV, they will be making the switch, one way or another. How do we make it more affordable? What are the short and long-term cost implications of doing so that have not been put on the record yet? We would like to hear about that.

Philip Gomm: I am not sure that you can guarantee that it will be cheap, but I suppose that you have to guarantee that it will be cheaper than running a petrol or a diesel car in the long term. If I return to the proposed EVED of 3p per mile for EV users, that still means that the fuel costs or running costs per mile will be cheaper than petrol or diesel cars. Maintaining that differential will be important if you are trying to encourage people into electric vehicles.

It was never credible that the Chancellor of the Exchequer would not come after EV drivers to pay some extra form of taxation to make up for the lost fuel duty, but drivers will want to know what the charges will be for using their vehicles over the medium term. That also extends to using vehicles in towns and cities, which includes measures such as congestion charging and ultra-low-emission zones. What will that cost be relative to having a petrol or diesel car?

Bob Doris: Can I check some costs with you? Say you are driving an EV car with an EVED of 3p a mile. In future, that could become 6p or 9p a mile. Would you like there to be certainty and a clear line of sight that costs will be constrained or capped in some way?

Philip Gomm: I think that the chancellor said—I stand to be corrected—that the intention is that that will rise with inflation, as fuel duty will again start to rise with inflation once the 5p that was taken off after the Russian invasion of Ukraine is reinstated by 2028. They will both rise, but they will rise by inflation, so some differential between the two will remain, and then it will be above the other costs that are associated with running an electric car.

One of the things that we have some concerns about is the availability of or ability of the garage and repair sector to have the skills to look after those vehicles, especially once they enter the second-hand market. You want to know that you will be able to drive your EV to your local independent garage as opposed to taking it back

to a dealership and perhaps paying premium prices. It is not just about the on-road costs or the fuels costs; it is about the peripheral costs and ease of use.

Bob Doris: You have just highlighted an issue that, as a non-driver, I am aware of: the cost of getting the exact same service from a dealership or from another provider who is licensed to operate to the same standards can be eye-wateringly different. Is there anything that Government can do to take some of the costs out of dealerships? I do not want to say that they have a racket going on, but they seem to say that you must go to them for your first couple of services or inspections, and people might not be aware that they can then shop elsewhere. That is an issue with the current market. Is that one of the risks for switching to EV, too?

Philip Gomm: I am not sure that the Government can do a lot, other than ensuring that the data from vehicles that is needed to look after and service them is made available to all those who want it, so that it does not become a BMW proprietary product, an MG proprietary product or whoever it might be. From a Government point of view, there will be a need to increase the skills base of all those who work in the motor sector. Overall, there is a shortage of skilled mechanics.

Bob Doris: Does anyone else want to come in? I am conscious that my notes refer to the role that the financial industry has to play. I am not against industries making money, but it would be good if they do so in partnership for the public benefit. Are there any comments on how we can work with the financial sector? Its fingerprints are all over the new car market and the used car market, as anyone will know who goes to purchase a car.

I see that Professor Anable wants to come in.

Professor Anable: I am not qualified to answer your question in any great detail, and I am not sure that I can in any case. I can say that, certainly in the early EV market, the finance industry was, in a way, actively working against the uptake of EVs. As Philip Gomm said, around 90 per cent of private buyers, if not more, buy a car via a finance deal, such as a lease deal or a personal contract purchase. At the beginning, the estimates of the residual value of EVs were so high that that meant that the monthly lease costs were also high in comparison with an equivalent ICE car. That has got a lot better because of more accurate estimates and less pessimism about the second-hand values of EVs. However, there is still pessimism about the residual values. Part of that comes back to the idea that we need a healthy second-hand car market in order to address some of the other players and partners in the market and so that we have confidence. It all needs to be joined up.

Generally, I think that your question is asking how we can assess the potential costs and, therefore, how we can then target measures, or whatever it might be, to lower costs and have more affordability. There are so many moving parts. We know that the purchase price of electric vehicles is coming down, that we have big global competition with much cheaper cars coming from China and that we have aspirations for the cost of electricity to come down.

As for the ICE market, vehicle manufacturing costs are going up and the cost of petrol or diesel are unlikely to come down much. On that basis, we probably will see a more favourable position with electric vehicles.

However, cutting across all that—again, I appreciate that this is not quite what you are asking, but I feel that I have to say it—is that, when we get into these discussions about electric vehicles, we are totally missing the point that, as we make the running costs of motoring cheaper in the future, we will have much more work to do to reduce car use and create better operational and cost-effective environments for public transport. This is all connected, so the goal of making motoring cheaper for people is not necessarily the goal that we want to have anyway.

Bob Doris: Thank you—that was helpful. I have no further questions. I feel that you might get asked more about that shortly.

The Convener: We will see. The deputy convener has some questions. Over to you, Michael Matheson.

Michael Matheson: On that point, Professor Anable, I am interested in the policy dichotomy around encouraging people to use electric vehicles to reduce emissions—as the draft climate change plan does—while also attempting to reduce the number of car journeys that are made. Do you think that the Scottish Government, in its draft climate change plan, has set out the right types of incentives to achieve both of those objectives?

Professor Anable: No, I do not. As you suggest, there is a total disconnect between the two sides of the equation. I am sure that we all know some of the history of the discussion around the target to reduce car mileage, which is in this plan in one form. It is good that it is still in there but the measures that sit behind it are woefully inadequate to achieve anything other than perhaps a slowing of the increase in car mileage rather than an absolute reduction. There is no join-up between that target and the idea that electric vehicles could potentially make the running costs of motoring cheaper and lock in car dependency.

Going back to something that I said earlier, there is no attempt to understand where we need

electric vehicles and where we think that we need to perhaps even restrict the uptake of electric vehicles. There is some good understanding of where we cannot decarbonise the transport sector through other means and, therefore, where electric vehicles will be necessary: that is in the more remote places in the island communities, and we should be thinking about a strong electrification strategy for those places.

To decarbonise the sector, it is the miles that matter and the proportion of miles that are carried out on electricity, not just the number of cars that are out there. Rather than simply having a blanket strategy of getting as many EVs out there as possible in order to hit a target, there needs to be much more joined-up thinking around where those miles are taking place and how we can electrify transport for those people who have no choice about the number of miles that they travel. A lot more thought needs to go into how we electrify the miles that we need to electrify rather than having a target about the number of EVs that are sold.

12:30

Michael Matheson: What would you say are the best policies that the Government could deploy to reduce car mileage?

Professor Anable: There has to be a combination of approaches, one of which involves good local provision of public transport. The emphasis at the moment is on active travel. That will not do it—it will do only a little. I will concentrate your minds by saying one thing: in the Netherlands, 29 per cent of trips are by bike compared to less than 2 per cent—really around 1 per cent—in Scotland, but the average per capita carbon footprint from personal travel in the Netherlands is higher than it is in Scotland because they love their cars and use them for most journeys other than the local journeys. The emphasis on active travel has to be damped down, frankly.

What is in the plan is good, and we need active travel for other reasons, but the idea that it will do anything to decarbonise the transport sector is sheer fantasy. That needs to be called out once and for all, so that we can have a proper debate about what journeys we can service by modes other than the car, which are the more medium-length journeys in towns and cities. We need to have proper integrated strategies at the level of towns, cities and regions, and we need to take the emphasis off active travel.

Once we have that strategy and see it start to bite, we will have absolutely no choice but to increase the cost of motoring at the local level by implementing things such as local congestion charges that will get people out of their cars on to those services. You can improve services as much as you like but it will not deliver a switch from cars unless you disincentivise cars at the same time. That is proven the world over. It is scientific and robust: you have to do both; you cannot just improve services if you want to get a modal switch.

Michael Matheson: Okay. It will be interesting to see whether there is a change in EV driver behaviour if they are charged per mile over the course of the next couple of years.

Professor Anable: There will be.

Michael Matheson: I suspect that the Treasury will keep a close eye on how that develops with regard to what it does in the future.

I turn to the issue of the Scottish Government's commitment to the installation of 24,000 new electric vehicle charging points by 2030. Jarrod Birch, you referred to that earlier. What is your view on the deliverability of that particular target?

The Convener: Sorry to intervene, deputy convener, but before we hear the answer to that question, although I feel that I am the negative person in this room constantly pointing out the time, I note that we are up against the clock. I tried to encourage the previous panel to make my Christmas by giving me short answers to short questions but they did not do so. I implore our witnesses to make their answers as succinct as possible.

Michael Matheson: Jarrod Birch, given that you mentioned the issue earlier, do you want to respond?

Jarrod Birch: As I said, I think that the target is ambitious and plausible but will require significant acceleration from where we are today. I will quickly put some numbers on it. Scotland added around 1,300 public charge points between October 2024 and October 2025. That is decent growth but, clearly, to add 24,000 by 2030, which is roughly four and a bit years away, there will have to be a significant speeding up. The Scottish Government's electric vehicle infrastructure fund is forecast to deliver 6,000 of those in partnership with the private sector by the same date. That will do some of the work, but we will still need another 18,000 to come from private investment. The question is, how will we make that private investment flow into Scotland at that scale?

I also mentioned earlier that there are some headwinds UK-wise in relation to charging investment, with a slow and sometimes painful process around grid connections. The operating costs for charge-point operators have gone up massively, which explains some of the concerns that were raised earlier on the cost to drivers of public charging. We have seen the standing

charges that are paid by charge-point operators rocket 462 per cent since 2021, and that has flowed directly through to driver prices as well as slowing down investment. Of course, as you heard earlier—I think that Philip Gomm mentioned it—there has been some uncertainty about the transition to EVs, which I referenced as being important to our investment case. There are many reasons to be pessimistic as well as optimistic.

Unfortunately—I should have said this earlier—many considerations around whether we will meet the ambitious targets that have been set by the Scottish Government on public charging are subject to levers that only the UK Government can pull. That is not a particularly optimistic or positive message but is a realistic reflection of how a lot of these issues are controlled.

I will briefly wrap up on one issue that is not in the plan. It concerns a factor that the Scottish Government controls and which, I suggest, dwarfs all the other issues: that of non-domestic rates, or business rates as we know them in England. Charge points have historically been exempt from those rates in England and Scotland, but operators south and north of the border have been approached by assessors in recent months and told that, while the charge point itself is exempt, the bay next to it—the one in which you would park your car to charge at that charge point—is not exempt. Unfortunately, that raises the prospect of significant bills for charge-point operators, with thousands or tens of thousands of pounds of unexpected costs. Clearly, that will have an impact on investment. In last month's budget, the UK Government responded by introducing 100 per cent rates relief for those facilities in England. Unfortunately, we do not have the same clarity on the situation in Scotland, and I venture that, unless we do, and Scotland finds some way to offer similar relief, it will be difficult to hit that 24,000 target because, all of a sudden, it will look much more attractive to invest south of the border rather than north.

I hope that was succinct enough. I am happy to follow up any of those points.

Michael Matheson: That is very helpful. My final question to you is on the charging infrastructure that needs to be put in place—not the grid stuff but the actual charging points. Clearly, it is important to install the right type of charging infrastructure, with more people wanting rapid chargers, or to have access to those chargers. Where is the vast majority of that equipment being manufactured for installation in the UK? Is it being manufactured in Scotland or in other parts of the UK?

Jarrod Birch: The rapid and ultra-rapid charging kit that you are talking about, which will give you a fast charge, is not manufactured anywhere in the UK. It is generally manufactured in Europe or Asia.

Michael Matheson: Is there a reason for that?

Jarrod Birch: I do not know off the top of my head. I suspect that it relates to the cost of producing the kit. It is usually fairly sophisticated and expensive kit, and I assume that labour costs are part of the picture, but I am happy to follow up afterwards with more detail.

Michael Matheson: Okay, thanks. That would be helpful.

The Convener: Sadly, Monica Lennon has had to go to another meeting, so I will ask her questions, but I first wanted to clarify the response that you gave to the deputy convener. Was it 1,300 chargers that were put in between October 2023 and October 2024? Is that right?

Jarrod Birch: The number is correct—it was 1,350—but it was between October 2024 and 2025, not between 2023 and 2024.

The Convener: Okay, so on reaching the target of 24,000, my maths would suggest to me that we are about 18 years away on that rate of getting the chargers. Is that about right?

Jarrod Birch: Assuming the same rate of growth and deployment, yes. What we have seen over the past three or four years is that the rate of deployment has increased as investment has flown in from the private sector but also, as more people jump into EVs, we will have more customers, and that justifies more investment. We hope and expect that the growth will accelerate over the course of the 2020s.

The Convener: The Scottish Government's plan goes up to only 2030. What do you see the landscape beyond 2030 being? Will it be Scottish Government driven or private investment driven? Should it be a mixture of both and should there be a plan?

Jarrod Birch: What we have seen with charger deployment UK wide, outside of Scotland, is that private sector investment has driven the large majority of it. Scotland has been a little bit of an exception to that over the past decade, with Charge Place Scotland. I think that the plan is absolutely correct that you can feasibly move to a model that is almost entirely led by private sector investment but with the public sector stepping in to fill the gaps in provision where the commercial case does not stack up.

It is hard to predict what the network will or should look like post-2030. We have talked a little about not knowing consumer behaviour. There is also the modal shift that Professor Anable was talking about. There is a lack of clarity, which we are learning about, on what balance you need

between low power charges, whether they are at home or on the kerbside, in a lamp post, for example, and higher power chargers, which the deputy convener was just referring to, which might be at motorway service areas or local hubs.

We are learning that drivers today use a mix of those. We tend to see them using a blend, but we do not know exactly how that will shake out over the long term. I think it is slightly a fool's errand to try to predict exactly what the charging network will look like in the mid-2030s or beyond.

The Convener: Okay. Mark Ruskell, I think you have a question that you want to ask.

Mark Ruskell: It has partly been covered, convener. It was about the problem of people who do not have a driveway and are looking for on-street charging options to get a much better EV tariff rate through their domestic electricity provider. Can you point to practical actions that the Government can take? I am aware of your suggestion that local authorities might be able to make those a permitted development and about there being better guidance there. Can you say—and perhaps others will want to chip in—what you see as being the game changers? There is a massive difference between paying 8p per kilowatt hour and paying 55p, 60p or 70p.

Jarrod Birch: There is indeed, and I think you have captured the main things that the Scottish Government and the UK Government are already doing. There is a consultation on permitted development rights, which would make cross-pavement charging solutions either over or under the pavement easier to install. There are also safety and liability questions around that technology. Those are not insurmountable, but they need to be worked through, and I believe that the Scottish Government is working on them. There are also pilots on how that would work in practice, which are happening in three local authorities in Scotland and dozens more in England. I think we are heading in the right direction to get those in place.

One option or route that we should definitely pursue is to give access to residential tariffs to as many people as possible. There will, unfortunately, still be some people who do not have that option, so we also need to try to drive down the cost of and increase access to public charging, which might be on-street charging in lamp posts. That will not give them access to EV tariffs on a domestic rate, but we should try to get that cost as low as possible so they can enjoy as much affordable charging as possible.

The direct answer to your question is that much has already been done. I do not think that there are any additional silver bullets that have not been identified yet.

Mark Ruskell: For consumers, do you see a need to join up energy services more? I think back to when I had an ICE car and I used to look at the petrol receipts every month, whereas now I look at my Scottish Power app and I can see where the electricity cost is with everything else. Is there more to do around integration, EVs providing an energy service for the house or battery storage? It feels like that is where things could be going, but I do not see much of a consumer offering there that can help people to save electricity costs through their EV or get on to better deals or better options through that.

Jarrod Birch: The first step in that, which you may be able to access in your Scottish Power app—I am not sure— is that if you have a home charge point you can take advantage of smart charging offers, so you can optimise your charging overnight. You can also do that with the public network with lamp post charging, which is a bit of an innovation, so that is a start.

Where we are going in the future, which certainly is not on the market yet in any meaningful way, is vehicle to grid or vehicle to everything, which is bidirectional charging with the vehicle giving back its energy to the grid at times where it is sensible to do so. There are numerous issues with that with the vehicles—and I will perhaps pass on to Andy Poole to answer that part—but also the cost of the hardware to make it possible. I often say that vehicle to ex is always five years away no matter when you ask the question, and it has felt like that for a while, so we are working on it. There are some technical complexities that we have to work through, but that is the holy grail of integration with the grid if we can sell the energy back from the car into the grid at the right time.

Mark Ruskell: Andy Poole, do you want to comment on that at all? Is it an attractive proposition for manufacturers to be offering to power somebody's tumble dryer at the same time as powering a car?

Andy Poole: It is certainly technology that is being looked at. It is deployed on some models now. As Jarrod Birch said, there are a number of challenges with the technology but also regulatory challenges in the role that those vehicles are playing on the grid. I think that some of those regulatory barriers are being looked at in a consultation at the moment. It is an option when it comes to what the eventual offer will be, but that is still uncertain. The technology is coming but, as has been said, all that technology adds to the cost of the vehicle itself and that ultimately is passed on to the consumer.

The benefit would have to outweigh the up-front cost as well. It is about your up-front costs versus the total cost of ownership and the benefits that

you get back from your power company. That is for the energy market to look at as well, but we are looking at it from a technology point of view.

The Convener: That is probably an interesting point to leave this. Somebody will have to then negotiate at what price the person buys the electricity back and whether it was the price that it was sold at. Otherwise, it could be an expensive tumble dryer.

On that note, thank you very much for giving evidence this morning and I am sorry about the pressure of time. It was always going to happen, but I appreciate all the time and the effort you have put into this. Thank you again and have a great Christmas.

I will briefly suspend the meeting for three minutes and we will move the rest of the meeting into private. Thank you.

12:45

Meeting continued in private until 13:00.

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