



**OFFICIAL REPORT**  
AITHISG OIFIGEIL

# Rural Economy and Connectivity Committee

**Wednesday 8 February 2017**

**Session 5**



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**Wednesday 8 February 2017**

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**RURAL ECONOMY AND CONNECTIVITY COMMITTEE**  
**5<sup>th</sup> Meeting 2017, Session 5**

**CONVENER**

\*Edward Mountain (Highlands and Islands) (Con)

**DEPUTY CONVENER**

\*Gail Ross (Caithness, Sutherland and Ross) (SNP)

**COMMITTEE MEMBERS**

- \*Peter Chapman (North East Scotland) (Con)
- \*Mairi Evans (Angus North and Mearns) (SNP)
- \*John Finnie (Highlands and Islands) (Green)
- \*Rhoda Grant (Highlands and Islands) (Lab)
- \*Jamie Greene (West Scotland) (Con)
- \*Richard Lyle (Uddingston and Bellshill) (SNP)
- \*John Mason (Glasgow Shettleston) (SNP)
- \*Mike Rumbles (North East Scotland) (LD)
- \*Stewart Stevenson (Banffshire and Buchan Coast) (SNP)

\*attended

**THE FOLLOWING ALSO PARTICIPATED:**

- David Beeton (Urban Foresight)
- Sally Hinchcliffe (Pedal on Parliament)
- Phil Matthews (Transform Scotland)
- Dr Jason Monios (Edinburgh Napier University)
- Professor Tom Rye (Edinburgh Napier University)

**CLERK TO THE COMMITTEE**

Steve Farrell

**LOCATION**

The Mary Fairfax Somerville Room (CR2)



## Scottish Parliament

### Rural Economy and Connectivity Committee

*Wednesday 8 February 2017*

*[The Convener opened the meeting at 09:31]*

#### Decision on Taking Business in Private

**The Convener (Edward Mountain):** Good morning everyone, and welcome to the fifth meeting in 2017 of the Rural Economy and Connectivity Committee. Before we move to the first agenda item, I remind everyone present to switch off their mobile phones. No apologies have been received for today's meeting.

Item 1 is a decision on whether to take in private items 4 and 5, which involve, respectively, consideration of a draft report on crofting and discussion of the committee's response to the Presiding Officer's commission on parliamentary reform. Do members agree that we should take those items in private?

**Members** *indicated agreement.*

## Draft Climate Change Plan

09:32

**The Convener:** Item 2 is an evidence session on the Scottish Government's "Draft Climate Change Plan: The draft third report on policies and proposals 2017-2032", or RPP3. The plan was laid before the Scottish Parliament on 20 January 2017, and the Parliament has 60 days in which to consider it. The committee will carry out that scrutiny in collaboration with three other committees. Last week, we focused on agriculture and forestry. This morning, we are looking at climate change in relation to transport.

I welcome to the committee Professor Tom Rye, who is director of the transport research institute and professor of transport policy at Edinburgh Napier University, and whom the committee has met previously; David Beeton, who is managing director of Urban Foresight; Sally Hinchcliffe, who is an organiser of the pedal on Parliament campaign; Phil Matthews, who is chair of Transform Scotland; and Dr Jason Monios, who is associate professor in transport planning and geography at Edinburgh Napier University.

I remind you all that, during the meeting, you do not have to push any buttons. The gentleman who is sitting to your left and to my right will be watching and will ensure that your microphones are activated. If you would like to come in, you need to indicate to me; the clerk, Steve Farrell; or the deputy convener, Gail Ross. I will try to get you all in if you indicate—we will try to ensure that we do not miss anyone. The most important thing is that you leave at the end of the meeting feeling that you have had a chance to feed in your thoughts.

The first question is from John Finnie.

**John Finnie (Highlands and Islands) (Green):** Good morning, panel. Can I have your views on the modelling that was undertaken to support the transport element of the draft climate change plan?

**The Convener:** Who would like to go first on that?

You are all ducking responsibility while you gather your thoughts. Tom Rye can go first.

**Professor Tom Rye (Edinburgh Napier University):** I will say a little bit, but I am not an expert on transport modelling.

The model for surface transport is based on traffic forecasts that are treated as something that cannot be influenced; they are sort of a given. At one of its modelling events, I said to Transport Scotland that that was not necessarily a very

helpful approach. One might instead want to start by asking what level of traffic we wish to have and therefore what we need to do to achieve that level.

In addition, as I understand it from the report and the supporting information, only one traffic forecast is assumed, whereas the United Kingdom national traffic forecasts have five different scenarios. In relation to those scenarios, the Transport Scotland assumption, which I think is growth of 27 per cent between 2015 and 2030, is on the high side. I have some problems with that, which I have just summarised.

I cannot say anything else about the modelling techniques because I do not know enough about them.

**Sally Hinchcliffe (Pedal on Parliament):** One thing stood out for me. I did not look at the full detail of the model, but I looked at its outline. It is divided into modes of transport and active travel is not considered at all, which made me wonder whether the impact of increased cycling and walking had been taken into account. From looking at the model as it is presented in the plan, there does not seem to be any evidence that active transport has been included.

**The Convener:** Does anyone else want to come in? I have noticed that Tom Rye has had a subsequent thought.

**Professor Rye:** Sorry.

**The Convener:** You can disagree with me early on if you like, but you may not get in again. [*Laughter.*]

**Professor Rye:** Apologies. I just want to clarify something regarding Sally Hinchcliffe's point. From talking to a modeller, my understanding is that the level of overall demand in the model is reduced depending on assumptions that are made about active travel. If, for example, the model says that there are 1,000 trips in total, an assumption is made that 30 per cent of those trips will be made by active travel. Those trips are removed from what are called the model's demand matrices, so 700 trips will be modelled using motorised modes of transport. I believe that that is how it works, in simple terms.

**The Convener:** Before I bring John Finnie back in, I will bring in Stewart Stevenson, who has a small question.

**Stewart Stevenson (Banffshire and Buchan Coast) (SNP):** It is a small question, but there may be a big answer.

To what extent does the system have a feedback loop? If you decide what the traffic volume will be and build to support that, you create an environment that almost creates that traffic. The question is, if your underlying

assumption is that there are no constraints on how people can use various transport modes, are the answers different from the approach that I know that we take, which is based on a constrained view? For example, the new Forth crossing is designed to have the same capacity as that of the bridge that it is replacing. However, the unconstrained demand for crossing the Forth might be quite different.

It is perfectly reasonable, in public policy terms, to use what we implement as a constraint. However, I wonder—and I do not have an answer to this—how the feedback loop between the two things is working and whether it is working the right way. More to the point, are we using it in a way that is helpful to the climate change agenda that we are discussing today?

**The Convener:** Do you want to come in on traffic planning, Jason Monios?

**Dr Jason Monios (Edinburgh Napier University):** No. I do not really have anything to add to what Tom Rye said about modelling.

**David Beeton (Urban Foresight):** I will take a step back before coming to the point. Broadly speaking, a robust evidence-based approach to exploring the challenges and coming up with answers to them is a good thing and has merit.

Clearly, issues of growing transport are linked to anticipated growth in population and the economy. When Government is planning policy for the future of those things, it is important that transport policy mirrors those policies.

You make the good point that, if you build it, they will come. If we build more roads, we will get more traffic; it is a self-fulfilling prophecy. There is also the point that not building those things constrains the economy—that is the continuing tension.

The draft climate change plan includes catalytic measures, which will have a significant impact on trips. Measures such as low-emission zones will, I hope, bring about the transformation that we would like to see.

Overall, it is about looking at the challenges and opportunities in a joined-up way.

**Stewart Stevenson:** I have a wee question before we move on. Low-emission zones are primarily about pollution rather than climate change. Is that correct?

**David Beeton:** The motivations are largely driven by air quality, but the consequence could be that there would be fewer journeys in cities, which would have a climate change benefit.

**Stewart Stevenson:** That is fine. Thank you.

**Sally Hinchcliffe:** In Scotland, we are planning to increase road capacity significantly by dualling the A9 and so on. Every model seems to show that those measures will increase motorised transport. Equally, the more cycling infrastructure, for example, that is built, the more cycling there will be. It works both ways; it is a sword that you can use in both directions.

**Professor Rye:** The low-emission zones that have been implemented elsewhere in Europe have led to a faster renewal of the local vehicle fleet than in areas outside the zones. That, of course, has had an impact on fuel efficiency and a consequent impact on climate change, as well as on local pollution, so the zones have those benefits.

On the question about our modelling assumptions, the tradition has tended to be to model on the basis of predicting the amount of traffic and then providing for it, although I accept Mr Stevenson's point that, sometimes, we will model for constrained demand, too.

Our modelling tools are not as sophisticated as they could be—perhaps they will never be sufficiently sophisticated. Consequently, I advocate the approach of thinking about scenarios such as where we would like to be and what we need to do to get there, otherwise the danger is that we end up in the loop that Mr Stevenson alluded to.

**The Convener:** I will bring John Finnie in, because there is a second thread to this topic.

**John Finnie:** I want to ask about the transport section in the plan and the scrutiny that organisations, such as those represented on the panel, and parliamentarians are obliged to give it. Given that the transport modelling was influenced by research carried out by consultants from Element Energy for Transport Scotland and that their report was published only last Tuesday, can we meaningfully scrutinise the plan?

**The Convener:** Who would like to lead on that? Are you all comfortable that you have not had a chance to scrutinise the plan or do you all feel that you have had a chance to scrutinise it?

**Dr Monios:** That is a rather leading question.

**John Finnie:** Go for it.

**Professor Rye:** Are you referring to the report on the potential for greenhouse gas emissions from vehicle technology?

**John Finnie:** That is a good question. I am talking about last week's report from Element Energy.

**Professor Rye:** I have made an attempt to scrutinise it.

**The Convener:** How did you get on?

**Professor Rye:** The Element Energy report that I read—if it is the same one—looks at the potential of low-emission vehicles and how big the market could be for them. It is on that basis that some of the predictions about the impacts of low-emission vehicles in the draft climate change plan have been made.

I was a little bit concerned, because the Element Energy report for Transport Scotland says that in-kind and cash support of about £1,000 for each vehicle purchase will lead to, by 2030, a 40 per cent market share for plug-in hybrid and battery electric vehicles. Therefore, by 2030, 40 per cent of cars would be low emission. That is based on the idea that people would be given a combination of incentives, such as free parking and perhaps cash, to buy such a vehicle.

Similar work carried out by the same consultants for the UK Committee on Climate Change predicted that, by 2030, for the UK as a whole, in-kind and cash support of £3,000 per vehicle would be required to achieve a 60 per cent market share for the same vehicles.

I am not saying that either is wrong, but it would have been helpful if the climate change plan and Element Energy's work that was published last Tuesday could have had a range of predictions of take up of low-emission vehicles. That would be in line with other research that has been done. There are so many imponderables in the take up of low-emission vehicles that it would be safer to say that we will have a low take up scenario and ask what that will do to the achievement of our climate change targets versus the high take up scenario. I do not see that in the work.

It would also have been good to have a little bit more comparison with or reference to what has actually been achieved in those countries that have a high take up of electric vehicles and I did not see that in Element Energy's report, although I did not have much time to give it full scrutiny.

09:45

**The Convener:** It is interesting that I am not noticing anyone else with their hand up. Oh yes, David Beeton wants to come in.

**David Beeton:** I am a little bit sympathetic, because I know how much work has gone on behind the scenes and that the report does not entirely reflect the sum of all the analysis and work that has been done to reach the conclusions and points that have been made in the climate change plan.

An important point to consider is the rate of technological change in this area. The price of batteries for electric vehicles is decreasing

radically and is expected to decrease exponentially during the next few years. We do not really know how quickly that will happen. The Government certainly does not have any direct control over that; it very much depends on industry expertise.

We also do not know how markets will develop. Again a lot of the incentives to promote the widespread adoption of ultra-low-emission vehicles are not necessarily within the gift of national Government, but are largely the responsibility of local authorities and possibly other commercial partners that can incentivise adoption of the vehicles. It is a complex area.

From doing work in that area, I know that you can come up with a forecast one day and six months later everything will have changed completely, so I have some sympathy for that.

**The Convener:** Peter Chapman would like to come in here.

**Peter Chapman (North East Scotland) (Con):** I just want to explore the subject a wee bit more. You said that the batteries for these cars are rapidly decreasing in cost. How sustainable is the idea of electric cars? If it goes worldwide and 90 per cent of cars are powered by battery, are there enough elements—nickel, cadmium and whatever else is used—in the world to produce the batteries? Are we going down a blind alley, in that we will run out of the basic elements to produce the batteries? That is a huge question.

**The Convener:** I do not want to pre-empt the answers, but we have a whole tranche of questions about battery technology later in the meeting. It is very interesting but I am going to be very rude and not let the witnesses answer until we get to those questions, so that I can keep things straight.

John Finnie, do you want to come back in?

**John Finnie:** Yes. I am sorry but I am still flogging on about the plan, because our job is to scrutinise and explain things to others. Are you concerned about the constraints that are being placed on the model by policy makers, the lack of detail about policy measures that were rejected, and the reasons for choosing to do so?

I will throw one example into the mix. Professor Rye talked about where we would like to be. An aspiration for many is a 20mph limit in residential areas. Would you like to comment on that as an example?

**Sally Hinchcliffe:** To answer your point about the lack of detail about policy measures, we noticed that there are few figures in the report compared with the last iteration in 2013, which had for each measure how much reduction was expected and how much it would cost. That seems

to be largely missing in the report as it is published in this iteration.

I found some reasons for that, but the one on active travel, for example, seems to talk only about walking journeys under one mile and completely ignores the 2km to 5km journeys, which is where we can see the most growth in bikes, the most potential for a switch to active travel, and where we have modelled potentially significant savings of carbon emissions. It would be interesting to see the Government figures on that because those calculations are just what we have done ourselves and they are not anything official.

The plan feels very short on detail compared to the 2013 iteration.

**Phil Matthews (Transform Scotland):** I echo a lot of what Sally Hinchcliffe has just said. There is a disappointing lack of detail and lack of quantification of individual policies and proposals.

To take a step back, as with energy and waste, you should approach this issue by thinking of a hierarchy of actions. The first action is to reduce the need to travel; the second action is to look for the more sustainable modes of transport; and the last action is to look for more benign technical fixes and so on down the line. However, the present approach to transport has very much front-loaded the technological-fix and electric-vehicles side of things. Those elements are important, but they are not the whole picture.

Our frustration arises because, given the predicted 27 per cent increase in road travel that you mention—and the fact that there are all sorts of Government targets, such as the 10 per cent target for cycling, that we are seeing no progress towards, and the Government's aspirations for public health, social inclusion and so on—we seem very much fixated in this debate on the electric-vehicles side of things rather than on measures that would help to deliver better places to live and more sustainable cities.

As Sally Hinchcliffe said, there is a lack of detail and a lack of putting the issue in the context of the Government's wider socioeconomic and environmental aspirations.

**Dr Monios:** I agree with the two comments that have just been made and would like to build on them a little bit.

A lot of the policy measures that are proposed have not been decided yet. We are going to try to negotiate emissions standards, excise duty differentials and biofuels policies, and we are going to look into low-emission zones and the idea of perhaps having a pilot in 2018. However, if those decisions have not been made, you cannot model them, because you do not know whether you are going to do them or not. The lack of detail

and the lack of quantitative figures and targets are linked to the fact that some of the policies have not been agreed or decided yet, which means that they cannot be modelled.

**David Beeton:** I agree that the issue comes down to what the Government can say will definitely happen. The Government cannot say that it will definitely have a low-emission zone, because that would be locally administered and a decision on it would be taken locally. The Government can encourage the establishment of a low-emission zone, but it is not in a position to make that happen.

The transport hierarchy is an underpinning principle of all transport policy and planning. However, we are talking about the climate change plan today and I think that, when you are thinking about how to achieve the decarbonisation of transport, you have to be realistic about the contribution that different modes can make. Cycling is not going to bring about a radical decarbonisation of transport any time soon. Given that more than 60 per cent of journeys in Scotland are by car, if you want to make a serious dent in carbon emissions, you will have to concentrate on that mode to a large extent.

**Phil Matthews:** I think that that is true—

**The Convener:** I will let you speak before I bring in Sally Hinchcliffe, but it would be helpful if, before people speak, they could catch my eye so that I can let them in. That will allow me to manage everyone's expectations.

**Phil Matthews:** The point that David Beeton makes is correct. I was not discounting the role that electric vehicles can play. However, as has been alluded to, the greater the increase in traffic growth and demand for road transport—which is partly based on transport decisions that are taken now, for example to invest in road building over investment in other modes and so on—the more challenging those targets become. The two issues are related. Decisions that are made on infrastructure spend and on how transport is managed within cities directly feed into demand for road traffic. It is also true to say that people are not sure exactly when electric vehicles and ultra-low-emission vehicles will kick in in a big way. We have major air quality challenges and congestion challenges now, and we seem to be basing decisions on things that might happen 10 or 15 years down the line rather than on actions that we should be thinking about taking now.

Government should be about joined-up thinking. Of course, the issues that we are discussing are about climate change, but government is also about delivering policy in the round and thinking about how things fit together. If climate change action is not necessarily meeting other targets that

are good, such as the targets for public health, that is something that should be involved in the thinking around the climate change plan.

**The Convener:** That is a good link into the next question, but I know that Sally Hinchcliffe wanted to come in.

**Sally Hinchcliffe:** It is true to say that 60 per cent of journeys are by car, but some of those journeys are very short. If we are just going to give up on the issue of people taking the car for journeys of less than 2 miles, we will dig a big hole for ourselves and the electric car solution will have more to do in order to save us. However, we can start to build for bicycles now, because bikes are here now and the issue is completely under the control of the Scottish Government. We can get going with bicycles now and, further down the line, improved low-emission vehicles can pick up the slack for longer journeys.

**The Convener:** Are you happy, John?

**John Finnie:** I referred to the 20mph limit because it seems to me to be more of the same. Do we have to look at mitigation rather than trying to change patterns of behaviour? I wonder whether the 20mph limit is more about air quality.

**The Convener:** That is almost a different question, but I am happy to hear very brief answers. I would like to move on to target setting.

**Professor Rye:** The 20mph zone issue is related more to road safety and local traffic. It may not have much impact on climate change because it does not have much impact on fuel consumption. If anything, it pushes up fuel consumption, but that depends on where the traffic redistributes to and whether it reduces the total number of vehicle trips.

Your wider question was about whether there is enough detail in the plan and whether we understand how the modelling has been done. I would not expect a huge amount of detail in a strategic document, but I would expect more detail in appendices—links to data sets and so on—to show how the working has been carried out. I would also expect a bit more detail about the implementability of many of the policies and proposals that are listed. We can assume that they will have an effect when they are implemented, but there is the issue of whether they can be implemented. To be honest, quite a lot of the things that are listed pose serious implementation difficulties, and it would be helpful for scrutiny of the document if that issue were looked at or raised.

**The Convener:** Unless anyone has anything significantly different to say on that, I would like to leave the subject there. John Mason has some

questions on targets that lead neatly on from what was discussed earlier.

**John Mason (Glasgow Shettleston) (SNP):** I would like to link looking back with looking forward. Perhaps you can combine your answers on the two things. How do you feel that we have done since the previous plan, RPP2? Have we achieved what we should have achieved? Are the targets that are being set for the next 15 years up to 2032 realistic? Are they overambitious or underambitious, or is it not as simple as that?

**The Convener:** Phil Matthews mentioned targets, so he can come in first.

**Phil Matthews:** Looking back all the way to 1990, I think that transport is the one major area in which we have seen very little reduction in emissions. That is very disappointing because, as I said, transport accounts for a large part of our emissions and we should be seeing significant reductions. Significant reductions in transport emissions would lead to a range of wider health, socioeconomic and environmental benefits for Scotland.

Looking forward, I think that a reduction in emissions of 30-odd per cent by the early 2030s is a reasonable and realistic ambition for the sector. However, as people have said, that is very much predicated on a range of unknowns. There are technological unknowns and there is the whole issue of European standards and the fact that a lot of the possible actions are predicated on action that is completely outwith the control of the Scottish Parliament. We also have the Trump presidency and the potential threat to the United Nations framework convention on climate change—there are questions about what that may result in. The target is a laudable aspiration for transport but, given that it is predicated on a few actions that are outwith the control of the Scottish Parliament, I wonder whether we can be sure that it can be achieved. Is there not a load of other things that we could focus on, which are under the control of the Scottish Government, local authorities and so on, that could deliver greater benefits more quickly and be more deliverable and more certain than what is in the plan?

**John Mason:** You say that our emissions reduction over the past 15 years has not been great. That has been due to a combination of things: vehicles have become more efficient, but the demand for them has risen and the combination has not been great—is that correct?

**Phil Matthews:** That goes back to a point that I made about the hierarchy of actions. Because we have not focused on reducing demand, we have had efficiency gains, as you say, but those have been balanced by growth in traffic.

**John Mason:** Presumably, then, going forward, there will again be a combination of issues, with some going up and some going down?

**Phil Matthews:** If there is a 27 per cent growth in road transport, that offsets any improvement gains from the substitution of electric vehicles. The lower that growth curve, the more savings we get down the line, so the two are very much related.

10:00

**The Convener:** I would like to bring in Tom Rye because I am sure that he has some views on that.

**Professor Rye:** I do. I agree with what Phil Matthews has said. One important point to remember is that we have a lot of end-loading of the emission savings, which means that the shape of the curve is not particularly helpful—even if we hit the target by 2030, a lot of carbon will be emitted in the earlier years between now and 2030, so the total amount of carbon that is emitted into the atmosphere will be greater than it will be if we adopt more effective measures more quickly.

My second point relates to all the uncertainties. There are so many uncertainties, particularly about the policies that are adopted in the CCP, and most of those, as Phil Matthews was saying, are outwith the direct control of the Scottish Parliament. There are so many risks of non-achievement. It would therefore be useful to have more discussion in the CCP about those risks. Perhaps that discussion is in there and I have just missed it, but if it is not, it would be useful to have that discussion about the risks of some of the key policies not being achieved, what impact that would have on the targets, what we could do instead and what impact that would have—

**John Mason:** Presumably, if there are a lot of risks in there, it is better to be cautious—or is it not?

**Professor Rye:** Can I answer—

**The Convener:** From what I hear from Phil Matthews and Tom Rye, we need to do risk analysis and then target where we can make a difference rather than hope that we can make a difference if it is not too risky. Is that what you are saying?

**Professor Rye:** We need more risk analysis, which will then drive the choice of measures. For example, if we think that there is a very high risk that leaving the European Union will have an impact on our use of EU emission standards, we should analyse that risk and what we could do instead.

**David Beeton:** The question about how we are doing perhaps naturally leads to what more we

can do or what is happening. There is agreement that transport is perhaps the underperforming sector when it comes to climate change mitigation and that far more can be done. However, there have been some improvements since RPP2, certainly in the area that we work in most—ultra-low-emission vehicles—where there has been a significant increase in sales. In 2015, sales of electric vehicles were equivalent to the previous four years combined and 2016 sales look set to outstrip that, so things are going quite well.

There is also a comprehensive network of charging infrastructure support, with more charging points per household in Scotland than anywhere else outside London apart from north-east England and Northern Ireland, so things are going well in that respect.

**The Convener:** I will bring John Mason back in to see whether, with an additional question, we can bring in some of the other panel members.

**John Mason:** I take the point that we could do with more analysis, more figures and all the rest of it but, somewhere along the line, we have to come up with a figure and say that it is what Transport Scotland will deliver over the next 15 years. Should we be more aggressive and go for a stronger figure even though there is a lot of risk around it, because that would make it look as though transport was contributing, or is the Government being more cautious and saying that it is not all that optimistic about transport and that is why we are having a lower limit?

**David Beeton:** The idea of a double-edged sword was mentioned. Targets can be such a thing—they can be very useful in motivating investment and focusing effort, but they can also create a situation where you spend your life defending yourself against the perception that you are not progressing fast enough to hit that target. I would probably caution against setting targets that you know are unachievable. I do not think that there is any point in grandstanding, although we have certainly seen that happen quite a lot in this policy area. A number of Governments have set targets that they have known to be unachievable from the outset.

It also comes down to what can be influenced. It is hard to say that an intervention or measure will lead to a direct outcome because so many things are outside the Government's direct influence.

**John Mason:** Is it the case that more things are outwith the Government's control in transport and that maybe more is under our control in forestry and agriculture?

**David Beeton:** Yes. It comes down to human behaviour a lot of the time. That is where things start to get very complicated.

**The Convener:** Does Sally Hinchcliffe want to talk about targets?

**Sally Hinchcliffe:** On human behaviour, if we concentrate our efforts on increasing efficiency, there will always be the countervailing pressure that the cheaper it gets to drive, the less incentive there is not to do so. If that is the only tool we have, it will weaken as we use it whereas, if we use other measures as well, there will not be the same countervailing force. Basically, if an electric car costs pennies to run, why not use it?

**The Convener:** Does Stewart Stevenson want to talk about targets?

**Stewart Stevenson:** I want to pick up on a tiny point. Does the evidence not show that it is the change in the pricing of travel that influences people, not the level of pricing? We have seen oil costs fluctuate in particular. We see a change in behaviours at the point of change, but there does not seem to be very much evidence that that is sustained once the price stabilises at almost whatever level that is. Is that correct or incorrect? The solution might not lie simply in the pricing.

**Professor Rye:** I think that you are talking about the idea of long-term versus short-term elasticities—that is, the responsiveness of behaviour to changes in price. Those elasticities are very different. In the short term in particular, the price of fuel for people who do not have much choice will not have much influence on how they travel. In the longer term, a big impact of the price of fuel will be in influencing people's choice of vehicle, where they choose to live, and how they choose to travel.

Earlier, we talked about feedback loops. There is clearly a feedback loop between land use and fuel price. In North American cities, a huge amount of fuel is used for transport per capita in comparison with European cities. We see there a longer-term effect of fuel price feeding into the transport system.

**Stewart Stevenson:** But their oil price is a third of ours.

**Professor Rye:** That is a policy decision that is driven by tax.

May I say something in response to Mr Mason question about the target?

**The Convener:** Yes, but briefly, if you will.

**Professor Rye:** The target should probably be more aggressive, but it would be extremely helpful if there was a range of targets and an explanation of what would have to be done to achieve each target was aligned with each one. It would therefore become more transparent that, if there was a more aggressive target, more would have to be done, and it would then be easier to justify the

choice of policy measures and targets that people have finally gone for. People could say that, if we wanted to achieve to a more aggressive target, we would need a more complex and interventionist set of measures and that, for a variety of reasons to do with politics, implementability or whatever, they had decided that they were not acceptable. A range-of-targets approach would be a better way of going about things. Perhaps I would say that because I am an academic and I like an analytical approach.

**The Convener:** Politicians would like that approach because it would give them all a chance to input and say how they wanted to achieve the target. That is a very important point.

I want to leave targets and move to demand management.

**Peter Chapman:** We have all heard that demand management is mostly about car journeys. We all know that there is only one person in most cars for most of the time. How much could the Scottish Government get involved in trying to change human behaviour—we have spoken about that—and encouraging more car-sharing schemes or whatever other ideas the panel might have to lower the demand for journeys by car?

**Professor Rye:** The demand for car travel is driven by cost and the time that it takes to travel by car compared with other modes. Other factors come in, but basically it is to do with cost and journey times. If it is faster and cheaper by car and slower and more expensive by other modes, or a combination of the two, people will mostly take the car, particularly if there is cheap or free parking close to where they are going. If we want to manage the demand for car travel, we have to influence those factors. If we want to have a big impact on the demand for car travel, that is what we have to get at.

Are there ways that we can do that? Yes. Modelling that the UK Department for Transport did in 2004 for a nationwide congestion charging scheme suggested that such a scheme would have a very significant impact on greenhouse gas emissions from transport, but I do not think that it is something that is politically acceptable. Car sharing can play a role, but only a small one, to be honest, because it does not have the necessary impact on time or cost for the majority of users. It can help people who are travelling a long way, who have high petrol costs, but that is at the margins of demand management.

I also draw the committee's attention to land use, which has not been mentioned yet. The patterns of land use that we are pursuing in most parts of Scotland are leading to people living further away from where they need to be and from

each other. Part of the demand for transport is—obviously—about journey distance. We can improve the fuel efficiency and carbon efficiency of our vehicles, but if we are living further away and we have to travel greater distances, that will offset the savings. That is part of the reason why we have not made much impact on the overall CO<sub>2</sub> emissions from transport. We should not forget land use, and it is slightly disappointing that it is not in the CCP.

The final point that I would like to make about demand management is about freight and van travel. We have somebody here who is more expert on that than I am, so perhaps I can defer to them if they want to say something about managing demand in the freight sector, but some of the biggest growth in traffic has been not in personal car travel but in freight, so we have to—

**The Convener:** We are coming on to freight, so I will cut you off at this point and bring in Sally Hinchcliffe, who wants to say something.

**Sally Hinchcliffe:** I reiterate that, by changing how we arrange our streets in our cities, we can make other modes of transport more attractive for shorter journeys. That includes having safe, separated infrastructure for cyclists, better design for pedestrians and reducing the permeability of towns and cities to the motor vehicle so that, rather than being able to drive through the centre of town, people drive to the edge and go on by another mode, or they drive round the ring road to get to where they are going rather than trying to filter through what may be a medieval street plan that was never designed for driving.

If, to get to the other side of town, someone can either drive 5 miles or cycle or walk a mile, the car stops being the obvious choice. That approach works well for small towns and for big cities and involves looking at the last mile or few miles of journeys, even if people have to do the bulk by car.

**The Convener:** Can I press you a wee bit on that so that I understand your comment? It seems to make sense to keep services in areas where people live. Is that the thrust of what you are saying? Should shops, the post office and the bank—all the services that people need—be in the settlements where people live, if they are big enough to justify that?

**Sally Hinchcliffe:** Yes. That is part of what is needed, but it is also important not to encourage through traffic that goes past service areas. The centre of town should be for people to stop and do things; it should not be a transport route.

**Peter Chapman:** We have talked about the 20mph limit. I assume that you would welcome 20mph limits in the middle of towns, because

cyclists feel safer and traffic runs that bit slower, which helps to encourage people on to their bikes.

10:15

**Sally Hinchcliffe:** The fact that 20mph speed limits cut child pedestrian death rates is argument enough for them. The benefit to cyclists is slightly marginal, but such limits do make a difference. Nowadays, everyone follows their satnav, and if the satnav calculates on the basis of speed limits, it will tend to send people round the edges of towns rather than through the middle of them. Therefore, 20mph limits could keep drivers out of town centres, which would improve things.

**The Convener:** It is a nice thought that we would not meet lorries trying to squeeze through places where they should not be.

As no one has anything else to say about demand management, I will bring in Stewart Stevenson.

**Stewart Stevenson:** I will explore what actions can be taken that will lead to modal shift. What I have taken from quite a few of the comments that have been made—most recently those of Sally Hinchcliffe—is that the key thing that will make a difference is making car transport less attractive to people. Politically and in policy terms, that is fundamentally difficult. It would involve taking measures such as reducing the national speed limit from 60mph to 50mph and making people drive further round towns to the extent that they would want to use other forms of transport. In other words, I am talking about disincentives. Is that how the panel sees it?

**Phil Matthews:** We have to bite the bullet, but there are two sides to that. As Tom Rye and others have said, people usually make quite logical decisions that are based on convenience, cost and so on. The issue is how we change the decisions that people make so that the most convenient choices are the more sustainable and lower-carbon choices.

Sally Hinchcliffe made points about encouraging people to cycle, which might involve having particular speed limits and providing segregated cycleways. We need much greater provision for cycling, along the lines of many European cities. If we think about the bigger picture, that often results in a city becoming a much more attractive place for people to live and invest in. Measures such as workplace parking levies, which impose costs on the road traffic side of things, are also important.

We have not really talked about buses, which are a major mode of transport, particularly in cities. They are a more socially inclusive mode of transport. Bus patronage has fallen by about 10 per cent in the past five years. Local authorities

and the Scottish Government could do a lot—bus priority measures and integrated ticketing are examples—to boost bus travel and help to integrate it with other sustainable modes, such as walking and cycling.

We must accept the need for some restrictions on cars, which could take the form of low-emission zones or workplace parking levies. We also need to consider how we can make the other modes more attractive. We should try to make cycling a pleasurable thing rather than a scary thing.

**Stewart Stevenson:** I am hearing about many positive changes that we can make so that alternatives are more attractive. However, although that is necessary to get people out of their cars, it will not in practice make a whit of difference if people are satisfied with the car as their mode of transport.

**Phil Matthews:** Edinburgh has spent more on cycling provision than other Scottish cities have, and cycle use is increasing there compared with other cities. However, the package has to be integrated. As Sally Hinchcliffe said, we have to think about how we create a situation in which the cycle route is shorter, safer and more attractive than the car route, because of the cost of parking and the length of the journey by car. We need to combine that with faster bus services and other alternatives to the car, such as trams and urban rail.

I agree that many people are wedded to their cars and that bold action might be needed, but there are examples elsewhere in Europe of how an integrated package of bold action has delivered a much higher uptake of cycling and pedestrian—

**Stewart Stevenson:** So we need a combination of disincentives and incentives.

**Phil Matthews:** We need a balanced package.

**David Beeton:** I almost feel as if I should apologise for sounding pro-car, which I am not—I am pro-climate. We get trapped into being anti-car as a solution to some of the problems.

We need to be realistic about the fact that a 100 per cent increase in the number of kilometres that are cycled in Scotland would be the equivalent of only about 1 per cent of all cars in Scotland being ultra-low-emission vehicles. We must be absolutely realistic about the contribution of cycling to our climate change ambitions.

We also need to recognise that 79 per cent of CO<sub>2</sub> emissions relate to journeys of more than 5km, which typically would not be cycled, and about 60 per cent of those journeys are of more than 10km, which typically would not be taken by public transport such as buses. We need to recognise that buses are a major source of air quality issues in many cities. Modal shift is not a

simple, straightforward answer to climate change or to providing air quality improvements.

We need to make progress on decarbonising all forms of transport and encouraging more active and sustainable transport. I agree about radical measures—things such as low-emission zones will bring about radical changes in behaviours. There is also a lot of enthusiasm about things such as workplace parking levies. Those are the sticks that can be used to make transformation happen.

**The Convener:** The committee takes the point that bicycling will not be the saving of emissions concerns, but the committee is also mindful of the huge health implication that bicycling will improve health. I see that Sally Hinchcliffe has a point on that, although I hope that she will not disagree with me.

**Sally Hinchcliffe:** Cycling unlocks other forms of transport. To get to Edinburgh from rural Dumfries today, I cycled, took a bus and took a train, rather than driving. A short journey by bike can make a rural bus more effective.

We have to remember that in places such as Glasgow, 50 per cent of households have no access to a car. We subsidise the car in many ways that we do not really notice—through free parking, for example. We are imposing costs on people who have no choice. We are also obliging people to use cars who maybe do not want to use them. Most children would rather walk or cycle to school but, because of issues of danger and distance, they cannot do that.

I know that it is difficult for politicians to say something that feels as if it is attacking cars, but you can rebalance things and give people choice. You would also be giving some of the people who do not have access to a car some of the benefits that car drivers have had.

**Rhoda Grant (Highlands and Islands) (Lab):** Some of my questions about improving buses have been answered, but I am interested in the comment on cycling and bus use. We know that buses have little space for wheelchairs and pushchairs, so how do we get the combination of cycling and bus use to work properly? Should every bus stop have a cycle rack where people can leave their bikes? Do buses have to be fitted with something that would allow people to take their bicycles on the bus?

**Sally Hinchcliffe:** The Netherlands has bike parking at every bus stop, and some bus interchanges there have more bike parking than a UK train station would have. That is one way of doing it. In other places, bikes can be carried on racks that are on the outside of buses.

Most rural buses are very quiet and, with a bit of flexibility, each bus could probably take one or two

bikes, as long as they gave way to wheelchairs and pushchairs. There are ways and means, but we need to do a lot more. Combining the bike and the bus is difficult. I have invested in a folding bike to enable me to carry out such journeys—I could not do them otherwise.

**Rhoda Grant:** We are to have a consultation on bus pass eligibility, and the suspicion is that the age of eligibility will rise from 60 to something older. What impact will that have on carbon emissions and bus use?

**The Convener:** Does Phil Matthews want to come in on that?

**Phil Matthews:** I do not really have an answer, although there might be research out there.

I have a point on the use of bikes and interchange. We need to create a system of seamless interchange and part of that is about information provision—such as letting people know through their phones when a bus is coming—to make the journey seamless. Taking bikes on trains is an issue, particularly in rural Scotland, because capacity is very limited—people sometimes have to book weeks in advance to get a bike on a train.

The issue needs to be considered in respect of railways as well as buses. As Sally Hinchcliffe said, all the measures that we see elsewhere in Europe, such as decent bike provision at bus stops and railway stations, are essential and show that what is suggested can be done.

**Professor Rye:** When the national minimum entitlement to free travel was introduced, we at Edinburgh Napier University did research that found that the wealthier car-owning elderly were to some extent leaving their cars at home, particularly for trips into town, because they had more time and thought that it was a bargain to go on a bus for nothing. That has been corroborated by other research. One supposes that, if that benefit was taken away from some of them, they would revert to using their cars for those trips. Such trips are relatively short, so the overall carbon impact would not be enormous. Nevertheless, the impact would not be positive—it would be working away from the targets.

**The Convener:** If nobody else wants to come in, I would quite like to move on to low-emission vehicles.

**Mairi Evans (Angus North and Mearns) (SNP):** Is the Scottish Government's estimated uptake of ultra-low-emission vehicles realistic and achievable? I am thinking about the estimate for private and freight transport.

**David Beeton:** The figure is our best guess—that is a good way of looking at it—and it reflects a lot of the forecasts that are being made. As I

mentioned, there is an evolving understanding of how quickly markets will progress.

There are two ways of looking at this. First, what does the industry intelligence tell us about the rate of diffusion of the vehicles into the market? How quickly do we expect people to buy them? How quickly do we expect the technology to advance to get to a price point and a level of functionality that will appeal to private users and commercial fleets? Secondly, what do we need to achieve for emissions reduction targets and air quality improvements? Unfortunately, the answers to those questions are not exactly the same, and that is a challenge.

Compared with other outlooks, the estimate is ambitious. The climate change plan cannot be considered in isolation. Transport Scotland's document "Switched On Scotland: A Roadmap to Widespread Adoption of Plug-in Vehicles" is highly ambitious and perhaps goes even further than the climate change plan in its 2050, 2040 and 2030 ambitions. The level of ambition in Scotland on the agenda is sufficient, but ambition is one thing and action is another. We still need a joined-up plan to make everything happen.

**The Convener:** We have talked quite a lot about private vehicle use, but part of Mairi Evans's question was on freight. Does anyone have any views on how we might deal with freight?

**Dr Monios:** I am the freight and logistics specialist on the panel to whom Tom Rye referred, which is why I have not jumped in to answer earlier questions.

There is much mention of consolidation centres in the climate change plan. I do not know whether the committee has a question on that idea, which is part of the proposals. I will not go into that in too much detail now if the committee wants to talk about it in a separate question, but it relates to the use of electric vehicles.

The statistics show that a lot of the growth in freight vehicles is in large goods vehicles—the white vans. That is what is happening now. The plan looks at more use of consolidation centres, with heavy goods vehicles coming to the consolidation centre and goods being distributed from there in vans, and there is the potential for a lot of those vans to be electric. Cargo bikes and other forms of transport for that level of delivery could also be used—that would depend on how far the goods had to go.

Given that the LGV market is growing and could grow further if we adopted a consolidation centre approach, it is important for a lot of the LGVs to be electric. Although they are smaller vehicles, there would be a lot more of them on the city streets and they might not always be full, so the result could be counterintuitive. That will be an issue for

congestion, and as many of them as possible should be low-emission vehicles.

There has been a lot of research on the use of electric vans, cargo bikes and so on in other countries, and the proposed level of take-up seems achievable. However, there are so many unknowns that it is hard to predict whether it will happen here. Much of that is down to behaviour, but I think that the ambition is reasonable.

**Mairi Evans:** This week, an article was published about what is happening in Norway and uptake of electric vehicles there. A lot of countries are using electric vehicles, but Norway seems to be the leader. I think that nearly 40 per cent of newly registered cars there are electric vehicles. What incentives are being offered in Norway? What is happening there that we could and should be doing in Scotland? From experience of a family member trying to purchase an electric car here, I think that it seems really complex. It is not fully explained to people when they go to purchase electric cars where slow, rapid and fast charge points are throughout the country. It sometimes it feels as though pots of money are made available to install electric charging points without there being an overall strategic picture of how they will fit in. I would be interested to hear your thoughts on that.

10:30

**Professor Rye:** I anticipated that there might be some discussion of Norway, so I had a look at some of the literature on what has happened there. David Beeton might know more. It is not my area of expertise, but I thought that it was a good idea to swot up on it.

I understand that the Norwegian purchase incentive package consists of zero purchase tax, which knocks off about £10,000, plus purchasers do not have to pay VAT on electric vehicles. They also get reduced road tax, get free public parking and do not have to pay tolls—there are quite a lot of toll systems in Norway. They get free charging at public charging points, although, strangely, there was no national strategy on charging infrastructure until recently; it was all a bit ad hoc, but there is now a strategy. Electric vehicles also get free access to bus lanes. All that reduces the cost premium of an electric vehicle to about €1,000, or £900. Does that sound about right to you, David?

**David Beeton:** Yes.

**Professor Rye:** I was going to compare the level of incentive and the cost differential to what is in the CCP.

**The Convener:** I would be happy to bring in David Beeton. I think that when Professor Rye

went through that list for electric cars Sally Hinchcliffe was a bit nervous that they might be allowed in cycle lanes as well.

**Sally Hinchcliffe:** Bus lanes are, unfortunately, considered to be cycling infrastructure in this country.

It seems to be the case in the climate change plan that the one electric vehicle that will not be subsidised is the electric bike, which now forms something like a third of the market in the Netherlands and Germany and is starting to transform the 5 to 10-mile journey as well as the 0 to 5-mile journey. We talk about the bike as though it can do only short journeys, but it becomes much more capable with pedelec.

**Mairi Evans:** Do any of the witnesses have an idea of how the Aberdeen hydrogen bus project, which is a new initiative, has been going? I would like to hear your thoughts about it, if you know how it has been operating, and your thoughts about hydrogen infrastructure.

**The Convener:** Who would like to lead on answering that? I am keen to bring others in, but it looks as though you are constantly in the firing line, Tom.

**Professor Rye:** I do not really know anything about the project. I have heard about it, but do not know how it is going. Hydrogen fuel cell technology is still relatively experimental and the big challenge is providing the fuel, because it is energy intensive to make and the fuelling infrastructure is a bit problematic.

**David Beeton:** We have had some recent involvement with the Aberdeen project, so I can say a little bit. The project has gone well: it has been great for the city, which has received a lot of global interest and attention from it. It also fits in well with the skills and capabilities in the city. With the focus on oil and gas and associated processing industries, there is a great amount of expertise in handling hydrogen and a great amount of hydrogen is produced. The buses there are working well, so there is a strong economic argument for what it can mean for the city.

There is still some way to go on hydrogen as a solution to decarbonising transport. There must be understanding that a mix of solutions will bring about the low-carbon future in transport. Hydrogen will have a role, electric vehicles will have a role, and cycling and public transport will have roles. It is easy to get trapped in binary thinking about choosing one form of transport over another, when really we will, as with renewables, see a mix of solutions in the future.

Hydrogen is expensive. My anecdotal observation is that the price of hydrogen fuel is higher than that of diesel. There is a need to

subsidise it, at the moment, but technology will progress, distribution systems will advance and things will get cheaper and easier. Perhaps the short answer to the question is that hydrogen is not a solution in the short-term.

**The Convener:** Members want to comment. Peter—is your question a supplementary on that?

**Peter Chapman:** I want to ask the question that you ruled out of order earlier, about the future of battery technology. If such technology is adopted worldwide, does the planet have the mineral resources to produce all those batteries?

**David Beeton:** That is not something that we can take for granted. However, electric vehicles will not be the source of the problem. Consumer electronics such as laptops and mobile phones use, in essence, the same lithium-ion battery technology, and such devices will account for a larger proportion of the global demand for resources than transport will.

There is a lot of effort being made around rare-earth elements, which are components in battery technologies. Some of those elements come from parts of the world where there are security and stability issues. The issue is therefore being given some attention by Governments around the world, but it is not necessarily going to hold back progress in the transport sector.

**Professor Rye:** Convener, may I finish saying what I had to say about the situation in Norway and its implications for the projections in the climate change plan?

**The Convener:** If you are very brief.

**Professor Rye:** In Norway, the cost differential between an electric car and a standard car has reduced to about €1,000. The modelling in the climate change plan assumes a cost difference between a diesel car and a battery electric vehicle of £5,500 in 2030, so a much bigger price differential is assumed in the plan than we are seeing in Norway at the moment. My information is that plug-in hybrids and battery electric vehicles have 27 per cent market share in Norway.

I wonder whether the range of incentives that are modelled in the climate change plan for take-up of low-emission vehicles is sufficient to achieve the market penetration that it is assumed will bring about the carbon reductions in the plan. That takes me back to my plea for a range of projections, rather than just one.

**Stewart Stevenson:** May I make a wee observation? Rare earths are not rare. They are just called “rare” because they are difficult to find and extract. They are not common, but they are not rare.

**The Convener:** I learn something at every committee meeting, Stewart.

**Stewart Stevenson:** I have a question, too, convener—that was not all.

The history of Government interaction with new and emerging technologies is a history of almost total failure to predict the winners. That is true of all Governments, of all complexions, in all countries.

I am aware of four separate hydrogen technologies—it is not just about cell technology. Do the witnesses share my worry that we are putting too much emphasis on single solutions rather than the strategic goal? For example, one technology involves suspension of hydrogen in a sort of gel, which creates a fuel that can be put into existing diesel vehicles. It is in the lab—it might never emerge from the lab. Who knows? However, in general, are we getting too fixated on technologies, rather than the goal? Should we be much more careful about leaving the door open to disruptive technologies that might be discovered next week and prove viable in 10 years' time?

**The Convener:** I am happy to let all the witnesses answer. That might be a question that you can answer briefly, so I will push you to do that, because there are other questions for us to ask and I want to bring Jason Monios back in on freight.

**David Beeton:** I agree with Stewart Stevenson. The Scottish Government's stated position is that it is technology neutral, which is the right approach.

There is a huge amount of hype around hydrogen, however. It is easy to get excited about a technology that is not yet there. Ultimately, the market will decide. Perhaps the role of Government is to support the market when it is pre-commercial—when it is seen to be a technology that will deliver significant benefits.

I advocate the technology-neutral approach. However, we also need to be aware that the way in which that message is communicated to markets can be confusing. A lot of the technology neutrality commentary from Government suggests almost that there is a suspicion that electric vehicles are perhaps a stepping stone towards a hydrogen future, which none of the outlooks suggest. We need to be careful that that is not communicated in a way that implies uncertainty about the future. For example, there is certainly consensus that electric vehicles are going to be the dominant propulsion technology in the future, but that that future will contain a range of different alternative fuels.

**The Convener:** I will not bring Tom Rye in here. I would like to just leave that point hanging for the

moment and, if I may, bring in Jamie Greene on encouragements.

**Jamie Greene (West Scotland) (Con):** Thank you, convener. I am sorry for varying slightly from the questions on our papers, but I would like to add to the conversation about hydrogen technology. Yesterday, I read an interesting article about what was described as the Betamax of car technology, in the sense that there was a lot of hype around it, as David Beeton said, but take-up has been very low. There was a UK Government scheme, I think in 2016, to encourage local authorities and public bodies to replace vehicles. Funding of about £2 million was available. It has been taken up by very few public bodies—the London Metropolitan Police, for example, has replaced some of its vehicles. That is just my observation on the subject.

I want to come on to the wider question of the move towards fuel-efficient vehicles. I have been reading the panel's submissions in our briefing papers and am intrigued by some comments. Perhaps you might expand on them.

Sally Hinchcliffe's submission says that

"incentives to increase take up of fuel efficient vehicles will ... increase car ownership"

and

"undermine ... demand management"

policy. Will you expand on your views on such schemes? There seems to be a view that we should perhaps not be incentivising people to move towards fuel-efficient cars.

**Sally Hinchcliffe:** We need to be careful about the incentives that we offer. Parking control is one of the few demand management policies, but if by buying an electric vehicle one can circumvent parking control, that is an example of two policies working against each other.

Lots of on-street parking causes problems for other modes of transport; cars lining the edges of roads make it difficult for buses, pedestrians and so on. We therefore need to be a bit careful about the incentives that we offer so that we make sure that we are not giving with one hand and taking away with the other.

**Jamie Greene:** I hear what you say on that. That brings me on to a point that Professor Rye made about the Norway model. I drive a diesel car: if someone came along and offered me an electric car that meant that I could use bus lanes and park free in the city centre, I would absolutely swap the diesel car for a greener electric one because those incentives were available. We have to be mindful of the fact that the incentives get people out of high-emissions vehicles and into others.

When the Toyota Prius came out, there was a lot of suspicion about whether it would be a success, but now every cab that I get into seems to be a hybrid car—that seems to be normal and acceptable. Does anyone have any views on that?

**The Convener:** Tom Rye wants to come in on that.

**Professor Rye:** My point is specifically on the Norway experience. In 2009, early research in Norway demonstrated exactly what Jamie Greene has just talked about. People in Norway who bought an electric car were disproportionately from two-car-owning households, which are unusual in Norway: most households own only one car. Those households' rate of car commuting is 80 per cent, compared with 45 per cent among the population as a whole. People who bought an electric car demonstrated a shift away from public transport, cycling and walking and towards use of their electric cars. I presume that that is because some of the demand management tools that apply to people who do not have electric cars do not apply to them—in particular, in relation to parking. Therefore we have to be cautious, as Jamie Greene suggests.

10:45

**David Beeton:** I have visited Norway a few times. The Norwegians have a great package of measures, but the fundamental point is that it is cheaper there to run electric cars than it is to run fossil fuel vehicles, which makes the decision very easy for a Norwegian. The up-front premium is marginal, and operating costs are far lower. As a result, the decision is, in many ways, a very rational one. I do not think that we will be having a 100 per cent purchase tax on top of the cost of buying a fossil fuel vehicle any time soon, because it would be very difficult to introduce. Moreover, the Norwegians started 10 years earlier than we did; they are 10 years further forward.

However, we have put certain things in place. For example, people can park an electric vehicle free anywhere in the city of Dundee. The Scottish approach is very joined up; there is the “Switched On Scotland” road map, which covers all the incentives that are necessary for bringing about widespread adoption of electric vehicles, and there is the “National Framework of Local Incentives for Electric Vehicles”, which is a review paper that we wrote for Transport Scotland and which looks at what local authorities can do. The integrated energy strategy also merits mention as a joined-up strategy that covers power, heat and transport and which looks at everything in the mix. I should also note that Transport Scotland is updating the “Switched on Scotland” road map for publication in the spring, so there is an opportunity to feed into that process.

**Jamie Greene:** Does anyone have a view on the target of 40 per cent by 2030? Input that has been received by the committee suggests that that is not aggressive enough and that the figure should be nearer 60 per cent. Obviously that applies to new cars.

**David Beeton:** The 2050 ambition is for almost complete decarbonisation of road transport. If we work backwards from 2050 and see what we need to do in order to hit that point, we find that we will probably need ultra-low-emission vehicles to make up almost all new car sales by 2040, which would put us ahead of the 40 per cent target. The 2050 ambition still stands, and the UK Government has signed up to that target, too. It is perhaps worth questioning, though, whether it is consistent in its ambition.

**The Convener:** We will move on to Rhoda Grant in a moment, but I feel that we have not developed the freight theme enough. Dr Monios made a very interesting point about reducing emissions by pushing out from hubs with electric vans. Can you briefly explain to the committee some of your plans or suggestions for increasing the amount of freight that is moved by means other than roads, and for reducing emissions?

**Dr Monios:** Sure. Poor old freight is often the forgotten cousin as far as transport is concerned.

The CCP mentions consolidation centres a lot, sometimes on their own and sometimes in conjunction with low-emission zones. However, the fact is that although transport policy and other such documents have been talking about consolidation centres for the past 10 years, we still do not have one in Scotland.

To say that private sector operators and users are reluctant to use consolidation centres is a massive understatement. Basically, they have no interest in them at all. They potentially add costs because of extra handling and so on, and they potentially add time. They add complications because of the need for extra storage, the fact that an extra link is being put in the chain and so on. They create a lot of difficulty, hassle and cost that people do not want. There has been a lot of talk about how to make them more feasible, cheaper, more attractive and so on, and although people have done a lot of work on the matter, we still have not got there.

Tactran has done a lot of work on consolidation centres. It even got quite close—it was going to get a centre up and running, but it did not happen. It might still get one off the ground in Perth. The fact is that it takes a lot of work from the public sector to put this kind of model together.

We are working on the issue at Napier University. We have recruited a PhD student to look not only at comparisons with other countries

that have been a bit more successful in this respect but more specifically at the conjunction of the consolidation centre policy with other supportive policies. Some of the things that are mentioned in the document are good, especially the references to low-emission zones, time windows and pedestrianisation. The question is this: if the consolidation centre does not work now, will it work if you have the right policy in place? It will be another year or so before we get any results, but I think that that is the way you have to go. You definitely need a supportive policy.

It is also important to think about different kinds of consolidation centres. For example, there might be a large one near the bypass on the edge of town, a smaller one in town at Cameron Toll or Fountainbridge and another even smaller one—people sometimes call them micro consolidation centres—on Rose Street, from which people would make deliveries on trolleys or bikes. The different hubs all have their own strengths, weakness, traffic profiles and so on. We have not really cracked that nut yet. Even in countries that might have more progressive transport policies, there are only a few such centres and they still find it to be a difficult nut to crack.

We are also looking at pedestrianisation. You might not think of that as a freight policy, but pedestrianising a city centre obviously makes it difficult to deliver goods to shops, hotels and so on, but such a move can become a supportive freight transport policy that can work with a consolidation centre. I think that that sort of complementary approach is the right way to go, but there is still a lot of work to be done.

**Professor Rye:** Although the consolidation centre idea is very interesting in how it addresses the problem of urban freight deliveries and all the problems that are associated with having in urban areas large trucks that should not be there, it deals only with the last mile or the last few miles of a freight journey. As with passenger transport, the bulk of carbon emissions come from longer journeys or the longer sections of journeys, so the effect of the consolidation centre on such emissions might not be so great. However, the matter has not been particularly well assessed as yet.

We also have to think about measures to influence the carbon emissions from trucks, especially vans—which have seen the biggest growth in this sector—that do not go into city centres and which therefore would not be affected by consolidation centres. Such approaches would include uptake of alternative fuels, electric vans and other kinds of fuel technology and fuel efficiency measures for HGVs. Some of those developments are already being driven by the sector, because the larger companies want to

achieve fuel savings, but Governments could do a lot more to encourage uptake of those new technologies and reduce the carbon emissions per mile of the vehicles that are travelling out there.

**The Convener:** I will let Jason Monios back in, and then I will move to Rhoda Grant.

**Dr Monios:** I want to expand on Tom Rye's point about longer distances, particularly in the context of freight. Some of what has been achieved has happened through modal shift; indeed, there has been a large increase in modal shift from road to rail between England and Scotland, a lot of which has been driven by logistics providers consolidating containers from different shippers and then filling trains. However, they all rely on on-going subsidies from the modal shift revenue support scheme, and although the achievement has been very worth while, supporting it is costing a lot of money annually.

As for the difficulties with longer-distance freight, Scotland is obviously quite rural and dispersed. Actually, in this respect, the difficulties are the same for passenger and freight transport; just as it is harder to support rural bus networks, it is harder to get freight on to the rail network, because there are only a few major spines and the freight itself is quite dispersed. There has been some success in that regard, with logistics companies taking stuff up to Aberdeen and Inverness subject to infrastructure constraints. The plan itself mentions the rail freight strategy and the need for longer trains, which is also very important.

The plan also talks about electrification. Electrifying more of the rail network will be a valuable move, but if you are able to take 40 containers instead of 20 on a train, it will cost you very little more and you will take twice as many trucks off the road. Network Rail is doing a lot of on-going work to put in place longer passing loops and basically to increase capacity so that we can get longer trains. In the United States, there are trains that can take 600 containers; in the UK, the longest trains can take about 90 containers and, to get to the north of Scotland, you can take only 30 or 40. That gives you a sense of the scale of what we are trying to achieve.

Measures that allow longer trains will definitely help, but the fact is that freight is quite dispersed. A lot of work has been done to get more timber on to rail, but as you can imagine, that sort of thing, too, is very dispersed. Unfortunately, those on-going challenges recur in every one of these documents, but, again, a resolution appears to be on the horizon.

**The Convener:** I said that I was going to bring in Rhoda Grant next, but I want to bring in John Finnie for a brief question.

**John Finnie:** You said that it would be great if 30 or 40 containers could go on the Highland main line but it is subject to infrastructure constraints. That takes us back to the issue of considering a policy in splendid isolation. The infrastructure constraints of the single-line track mean that it takes only 20 or 21 units, which is not the optimum number. Can we marry together all those issues? People are trying hard. You talk about the combination of freight, which is happening—supermarket goods are going up and timber is coming down. Where does that fit in? Is there a gap in the plan's explanation of how the benefits could be accrued?

**Dr Monios:** As with many of the problems that we are discussing, there are several different inputs. One of those is getting the customers to want to use rail; that took a long time, but they are getting used to it now. There is the cost. Freight trains get subsidised because, until we can get much longer trains, subsidy is needed to bring down the unit costs. There are also delays. If there is only one train a day or perhaps not even that many, that does not fit in with the shops' just-in-time logistics.

If we look at anywhere in the world where freight is successful and cheap, we see high capacity, frequency and demand and balanced demand in both directions. The Government cannot really click its fingers and fix all those matters, because many of them are market issues. However, it can address the infrastructure issues, and Network Rail is doing a good job of that. It comes down to cost benefit analysis. How many tens of millions of pounds does Network Rail want to spend to get 10 more containers going to Aberdeen? When it crunches the numbers, that might not stack up at the end of the day, unfortunately.

**John Finnie:** Yes but, similarly, if we spend £3 billion dualling the A9 and give a further half-hour competitive advantage to haulage by increasing the speed limit, that move will not be made.

**Dr Monios:** The Rail Freight Group has had a lot to say on that, so it can give you chapter and verse.

**The Convener:** I fear that that was a statement. Perhaps we should leave it hanging there so that I can bring in Rhoda Grant.

**Rhoda Grant:** I have a question about decarbonising rail and ferry services. Are rail electrification and hybrid ferries good value for money? Do they make a difference?

**Dr Monios:** I am not really the ferry expert. Our erstwhile colleague Professor Alf Baird would be the man to talk about ferry design.

Is rail electrification worth doing on long rural routes? That is a thorny question. We want to do it

as much as possible, of course, but is it worth it if there is only one train a day for freight? Obviously, there are more passenger trains. I have talked to operators in the United States, who think that it is crazy—they are not going to electrify thousands of miles. The longer the distance, the lower the cost benefit ratio of electrification. Electrification is being looked at more for England and the central belt. I do not know the figures off the top of my head, but I think that for long-distance rural routes just using lower-emission fuel might be more beneficial than electrification.

The plan mentions cold ironing, which is using shore power in ports. When a ship is berthed, instead of using its on-board engine to power the lights, it can plug into an electric connection in the port. A big port that has many ships will spread the cost over many more vessels, but Scotland has a lot of smaller ports that do not have so many vessels. How many millions of pounds will you spend on the electrification of the power in the vessel when you might get more bang for your buck by using lower-emission fuel and other technologies? It is not for me to say, but the individual who makes the decision might have questions about the cost benefit ratio.

**The Convener:** Phil Matthews wants to come in, but I am mindful that I have three committee members who have three very important questions to ask. I will let Phil come in very briefly and then move on to the next question, if I may.

11:00

**Phil Matthews:** On the subject of rail electrification, rail already has a very low contribution to the overall carbon footprint. It is a very efficient form of transport. Electrification is good for all sorts of reasons, such as increased acceleration, better journey times and so on.

Going back to the point that John Finnie and others have made, if we look at the big corridors that we have—particularly Aberdeen to Inverness and Perth to Inverness—we can see that we have a Victorian single-track railway that is not suitable for fast journey times for either passengers or freight. There are no—or very few—passing loops and so on. Rather than thinking about those corridors in total, and looking at road and rail together, we have gone for throwing billions of pounds at road transport and not really thinking about a railway that is already slower, as one of my colleagues has said, than the road alternative.

Electrification, particularly on the Aberdeen line, and some upgrading there are really important. On the Highland lines, the solution is about dualling the track as much as possible and that will be great for passengers and for rail. If a rail journey takes two or three hours, people will not fly that

distance; however, rail can compete well with the road alternatives, whether that is for haulage or for passengers. We need to focus on that length of rail journey if we want to offset carbon.

**The Convener:** Rhoda Grant wants to come back in. I will let her in with one question, but only one person will get to answer it.

**Rhoda Grant:** If we are looking at reducing air passenger duty and at those shorter rail journeys, do those swing the balance towards flying rather than using rail?

**Phil Matthews:** Again, it is all about choices—the choices that we make on infrastructure, spending and cost incentives. Transform Scotland says that cutting APD, when air travel is already undertaxed compared with other transport modes, is a bad idea. Virgin Trains has said recently that it could be quite devastating for its business, particularly on the London to central Scotland routes, and potentially London to Aberdeen, if we cut what is already an undertaxed air alternative to rail, when it has been building a good case for rail over the past 10 or 20 years.

**The Convener:** I will definitely leave that subject there. Richard Lyle has been waiting patiently to ask his question.

**Richard Lyle (Uddingston and Bellshill) (SNP):** Thank you, convener. Good morning. I come on to the meaty subject of the Scottish Government's transport capital investment programme.

Earlier, Sally Hinchcliffe and John Finnie touched on the dualling of the A9. In my area, which is Uddingston and Bellshill, a massive upgrade of the M8, M74 and M73 is being carried out, which will allow the underpassing of the M74. That is supposed to open quite shortly. On trunk road and general traffic upgrading, the Standing Advisory Committee on Trunk Road Assessment report, entitled "Trunk Roads and the Generation of Traffic", said that, given that

"it is highly likely that ... major investment"

has been

"made by the Scottish Government in the trunk road network"

—which it has—that

"will lead to extra miles being driven".

Do you agree, or does the Scottish Government's capital investment in transport infrastructure best support its emission reduction ambitions? I am sure that I will get good answers on that one.

**The Convener:** Tom Rye almost launched himself out of his seat to get to that question first, so I will let him go first.

**Professor Rye:** I suppose that the answer is no.

**The Convener:** That is a perfect answer. [Laughter.]

**Professor Rye:** The "Carbon Account for Transport" looks at transport projects that are currently under construction or in planning, and assesses their carbon impact. We see that a net increase in carbon emissions is projected to arise from all those investments—not surprisingly.

What I would like to know from the "Carbon Account for Transport" is whether the wider land use impacts of those investments are also taken into account in those projections. I suspect that, in general, they are not, and I think that those impacts will lead to further journey lengthening and reliance on cars. Due to those mainly trunk road investment schemes, new development will be attracted to the new junctions, which will mean that people are travelling further and travelling by car more than is modelled even by the "Carbon Account for Transport".

The cost of the Edinburgh to Glasgow improvement programme is pushing £1 billion to electrify the railway network between Edinburgh and Glasgow—but, unfortunately, not to increase the frequency of service—and to reduce the journey time by somewhere in the region of seven or eight minutes. The EGIP scheme is projected to reduce carbon emissions because the diesel trains that currently run will be replaced by electric ones. However, is that a cost-effective way of reducing carbon emissions? I say absolutely not. Although I am a professor of transport, I think that the £1 billion could be better spent on building affordable, high-quality houses close to where people need to be, so that they do not have to travel so far. Then they would be less dependent on carbon-emitting sources of transport.

**The Convener:** Would Sally Hinchcliffe like to come in on that?

**Sally Hinchcliffe:** I do not know whether you have seen the Spokes submission, which was made yesterday. It considers the balance of trunk road spending versus investment in active travel. Although we hear a lot about the record levels of Scottish Government investment in cycling, we do not hear so much about the record levels of investment in trunk roads. I think that the increase there is four times the total spending on active travel. That does not just cut journey times between cities; it funnels large numbers of cars into town centres and cities, which then causes problems elsewhere. A small rebalancing of that budget could have a large impact.

**Richard Lyle:** Cycle and walking tracks that I am sure you would be quite impressed by have been built on to the M8 upgrade.

**Sally Hinchcliffe:** Some of the trunk road schemes are good. However, rather than just running such infrastructure alongside trunk roads, if we are bypassing a town or giving people the option to go past it, we should consider taking steps at the same time to reduce the traffic in the town by reducing the town's permeability. People who were going past the town would have the bypass to use and it would not be possible or would be much harder to take a car through the town.

The Netherlands, which has very high cycling rates, builds a lot of roads. It builds very big roads but, when it builds a big road around a city, it counteracts that with the idea that people can now drive to the city but not through it. We do not do that; we just build the road. We may be putting in nice cycling infrastructure when we are improving trunk road connections in that way, but we are not looking at the whole picture. When you drive along the A75 where I live near Dumfries, a nice cycle path that joins one dairy farm to another appears, because that bit of road got widened. That cycle path is completely useless.

**Richard Lyle:** Tom Rye wants to come back in, but you have hit on a subject that I thought that I might not ask about but will now ask about.

My mother-in-law was Dutch. My wife and I have been in Holland quite a number of times and have cycled—not a lot—round Apeldoorn and other places where my brother-in-law worked. How do Dutch emissions compare with Scottish ones? Over there, there is a massive number of bikes—you have to see it to believe it—but the infrastructure is geared to that, because the land is quite flat.

**Professor Rye:** Transport emissions per capita in the Netherlands are lower but are still growing, because car use is increasing. Despite all the fantastic cycling infrastructure, there is an awful lot of road infrastructure, and house prices mean that people have to travel long distances to work by car and by train.

I will make a point on the wider impact of investment in trunk roads. The Government's justification for investing in trunk roads is to reduce journey times and therefore increase economic growth. Although that is a compelling theoretical argument, the empirical evidence for it is extremely difficult to establish at a country level. If we cut journey times, we do not necessarily increase economic growth. On the other hand, we make car travel cheaper, which encourages more of it, and we know that that increases carbon emissions. The empirical evidence to support the automatically assumed link between cutting journey times, improved trunk roads—or improved railways—and increased economic growth at the country level really does not exist.

**Sally Hinchcliffe:** I reacted when the argument was made that the Netherlands is flat. The country is flat, but it is also quite windy, which is almost as bad as being hilly for those who cycle a lot.

The cycling rates in different cities have nothing to do with factors such as weather, terrain or even size and density. If we look at the correlation with cycling rates, the one factor that comes out is the length of cycling infrastructure. Correlation is not causation, but there is a very strong case that it is the cycle paths in the Netherlands that make people cycle, not the flatness.

**Mike Rumbles (North East Scotland) (LD):** The draft climate change plan is all about getting people to change their behaviour. The best way to do that is through positive reinforcement rather than negative reinforcement—through the carrot rather than the stick. It has surprised me this morning that, by and large, the discussion has been orientated to private transport as opposed to public transport, although we have touched on public transport—on buses and rail.

I put it to you that there are environmental and health benefits from moving people to public transport, especially in our cities. There are 1.3 million Scots who have the free bus travel pass, which 70,000 Scots become eligible for every year. We are talking about reducing car use, cutting journey times and so on. Do you agree that, if we managed to get people to leave their cars at home and to do without their cars—in a lot of cases, altogether—by using the travel passes more, that would be good for the environment, as it would reduce emissions, and it would be good for people's health? That is surely a win-win situation, is it not?

**David Beeton:** Absolutely—if the buses are low-emission vehicles. We need to be aware that air quality problems in cities are quite often attributed to buses rather than to private cars. Buses are high-mileage vehicles that are quite energy intensive and produce quite a lot of emissions, so diesel buses driving around the cities are a problem.

There are ambitions to decarbonise buses, and it is important to bear in mind the replacement cycles for the vehicles. The average age of a bus in Scotland is more than eight years old, and the average replacement cycle for a bus is about 10 to 15 years. If we are to hit targets in the future, we need to make quite rapid progress in decarbonising the buses in our fleets. More people on buses is a good thing if they are low-carbon buses.

**Professor Rye:** Improved public transport and improved alternatives are part of the answer, but they are not the whole solution, as has been said. It is important to have a package of measures to

tackle emissions. Emissions from transport are a function of trip length, the carbon intensity of the fuel, the vehicle technology and the mode of transport that is used. If we want to focus on and bring about mode shift, we need to improve the alternatives, but I am afraid that all the evidence suggests that we also need to make car use a bit more difficult. An example of where that has not been done is in the city of Madrid, which I grant has experienced high population growth.

In the past 15 to 20 years, Madrid has increased its metro network from about 150km of metro to about 250km of metro. It has also improved its suburban railway network. However, when it improved its motorway network, it did not introduce any demand management measures, and there has been no mode shift.

There has been an incredible improvement in the public transport system but, at the same time, no measures have been taken to make car use more difficult, so the mode split is the same as it was. What has to be borne in mind is that, if we only improve public transport without making car use a bit more inconvenient, the new passengers on public transport will primarily be people who have been attracted to it from walking or cycling.

11:15

**Mike Rumbles:** You raise an interesting point, but I wonder whether the perspective is right. I come from a rural area, as do a lot of us on the committee, and there is often no real alternative to the car in rural areas. I live 30 miles from Aberdeen, for instance, and 7 miles from the nearest village. We have a bus that passes I do not know how many times, but I cannot use it because it is not frequent enough.

The problem is how we make bus transport more attractive. I am not talking about just the cities; we could improve rural transport by making it more efficient and expanding the free bus travel pass scheme. As I said, 1.3 million of us already have free bus passes. At the moment, the scheme is for people who are aged 60 or over and those with disabilities, but I know that the Government is looking at expanding it to younger people. If we expanded the scheme to get more people to use buses, we would make bus transport more attractive in a positive way. We do not necessarily have to come from a negative perspective. Do you agree?

**The Convener:** Does Tom Rye want to respond?

**Professor Rye:** I have a valid point.

**The Convener:** I do not know whether saying that disqualifies your previous responses.

**Professor Rye:** Well, I am sure that all my points are valid—I meant to say that I have a relevant piece of evidence. I think that we are talking about long-term elasticity effects in response to an improvement in service or a change in price.

**Mike Rumbles:** That is what I meant to say.

**Professor Rye:** Yes. *[Laughter.]*

Many years ago, in 1972, South Yorkshire froze its bus fares, and it did not put them up until bus deregulation in 1986. The long-term effect of that was to reduce car ownership, car use and driving licence acquisition among young people. However, a particular level of service and cost were associated with that.

It would be more difficult to bring about such a change in rural Aberdeenshire purely through price and bus service improvement, as it is difficult and expensive in rural areas to provide a bus service that is even half as attractive as the private car, because of the distribution of population and the distribution of destinations. In the long term, if one were willing to put in enough resource, one could probably bring about in a rural area a public transport system that was as attractive as the car, but a big price tag would be attached to it.

**The Convener:** That is a valid point. In some places, a person could get a bus somewhere to have a meeting, only to find that they have to stay on the bus to get home and that they have no time to go to the meeting, because the service is infrequent.

The deputy convener, Gail Ross, will ask the final question.

**Gail Ross (Caithness, Sutherland and Ross) (SNP):** I thank the witnesses for what has been a very interesting session. We have touched on a lot of topics, including RPP2 and the differences between that and the climate change plan. We have also talked about a lack of detail, land use and other things. To help the committee to capture your thoughts succinctly, will you tell us whether the plan is missing any policy that you would prefer to see in it?

**The Convener:** That is a really good question, so I will go along the line and give all the witnesses a chance to answer. I will limit each of you to one answer, although I know that there is no silver bullet to solve all the problems. If we could have one answer from each of you, that would be helpful.

**Phil Matthews:** As we said in our submission, workplace parking levies are in the plan, but they are not there as a clear policy. We would like them to be taken forward more actively by the Scottish Government and local authorities.

**Professor Rye:** Land use might be in there—I might have missed it—but, if it is not, I would say that it is crucial in controlling or influencing trip length positively.

**Sally Hinchcliffe:** Mode shift away from the private car, in a way that includes public transport, is needed. That was a strong part of the climate conversations but it does not seem to have come through to the plan at all.

**David Beeton:** I underline Tom Rye's point about land use and planning. Where we live, work and travel to is a huge part of the issue.

**Dr Monios:** It is difficult to point to one thing, especially with freight, as that is much more driven by the private sector. The Government has perhaps even less influence and control over freight than it has over passenger transport. I do not really have anything to add. I would perhaps like to add a little more teeth to the policies that are already in the plan, such as those on consolidation centres, low-emission zones and longer freight trains. Longer trains are in there; the issue is how much we want to spend on them. That is the key policy.

**The Convener:** I echo Gail Ross's comments—thank you all very much. It is appropriate that we spend a large amount of time on transport because, out of all the sectors that we have looked at, it is perhaps the one that needs the biggest change.

On the committee's behalf, I thank you all for attending. If you feel that I cut you off and you want to add something, there is still time to feed views into the committee. However, there is not much time, so I ask you to let the clerks know of any comments as soon as you can.

11:20

*Meeting suspended.*

11:25

*On resuming—*

## **Subordinate Legislation**

### **Plant Health (Import Inspection Fees) (Scotland) Amendment Regulations (SSI 2017/6)**

**The Convener:** Agenda item 3 is consideration of SSI 2017/6, which is subject to the negative procedure. The committee should consider whether it wishes to raise any issues in reporting to the Parliament on the regulations. Members should note that no motion to annul the regulations has been received, and there have been no representations to the committee regarding them.

Do members have any comments on the regulations?

**Members:** No.

**The Convener:** Does the committee agree to make no recommendations in relation to the regulations?

**Members** *indicated agreement.*

11:26

*Meeting continued in private until 12:35.*

This is the final edition of the *Official Report* of this meeting. It is part of the Scottish Parliament *Official Report* archive and has been sent for legal deposit.

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