OFFICIAL REPORT
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Rural Affairs and Islands Committee

Wednesday 1 March 2023

Session 6

The Scottish Parliament
Pàrlamaid na h-Alba

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CONTENTS

RURAL AFFAIRS AND ISLANDS COMMITTEE

6th Meeting 2023, Session 6

CONVENER

Finlay Carson (Galloway and West Dumfries) (Con)

DEPUTY CONVENER

*Beatrice Wishart (Shetland Islands) (LD)

COMMITTEE MEMBERS

Karen Adam (Banffshire and Buchan Coast) (SNP)
*Alasdair Allan (Na h-Eileanan an Iar) (SNP)
*Ariane Burgess (Highlands and Islands) (Green)
*Jim Fairlie (Perthshire South and Kinross-shire) (SNP)
*Rachael Hamilton (Ettrick, Roxburgh and Berwickshire) (Con)
*Jenni Minto (Argyll and Bute) (SNP)
*Mercedes Villalba (North East Scotland) (Lab)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Emma Harper (South Scotland) (SNP) (Committee Substitute)
Jackie McCreery (Dairy Sector Climate Change Group)
Andy McGowan (Scottish Pig Industry Leadership Group)
Andrew Moir (Arable Climate Change Group)
Edward Mountain (Highlands and Islands) (Con) (Committee Substitute)
Claire Simonetta (Hill, Upland and Crofting Group)
Chris Stark (Climate Change Committee)
Indra Thillainathan (Climate Change Committee)
Jim Walker CBE (Suckler Beef Climate Group Programme Board)

CLERK TO THE COMMITTEE

Emma Johnston

LOCATION

The Mary Fairfax Somerville Room (CR2)

Scottish Parliament

Rural Affairs and Islands Committee

Wednesday 1 March 2023

[The Convener opened the meeting at 09:03]

Future Agriculture Policy

The Deputy Convener (Beatrice Wishart): Good morning, everyone, and welcome to the sixth meeting in 2023 of the Rural Affairs and Islands Committee. I remind those committee members who are using electronic devices to switch them to silent.

Apologies have been received from Finlay Carson and Karen Adam. I welcome Edward Mountain and Emma Harper, who are standing in for Finlay and Karen at today's meeting.

Edward Mountain (Highlands and Islands) (Con): Although I have attended the committee and made a declaration of my interests before, considering the subject that we will discuss today, I want to make a slightly more detailed declaration of my interests so that there is no dubiety about my interest in the subject.

I am a member of a family farming partnership that employs three people full time. I have been farming in my own right for more than 40 years. I run a pedigree Simmental beef herd. I grow barley and vegetables. I farm not only land that I own, but also land that I am a tenant of. To save any dubiety, I note that I receive agricultural subsidies under the current schemes—the single farm payment scheme, the less favoured area support scheme and the beef calf scheme.

Thank you, convener. I thought that it was worth putting that on the record at the start.

The Deputy Convener: Thank you.

Our first item of business is pre-legislative scrutiny of Scotland's future agriculture policy, and our first panel comprises representatives of the five farmer-led climate change groups. I welcome to the meeting Jackie McCreery, chair of the dairy sector climate change group; Andy McGowan, chair of the Scottish pig industry leadership group; Andrew Moir, chair of the arable climate change group; Claire Simonetta, a member of the hill, upland and crofting group; and Jim Walker, chair of the suckler beef climate group programme board. Claire and Jim are attending remotely.

We have 90 minutes for questions and discussion. Members and witnesses who are in the room should raise their hand when they would like to comment. Attendees on the BlueJeans app should type the letter R into the chat box. The clerks will keep a note of the speaking order and I will bring people in in turn.

I will kick off with the first question. We are aware that agriculture was the third largest source of emissions in 2020, accounting for 18.5 per cent of Scotland's emissions. To start the discussion, will each witness indicate the key areas of emissions reduction and mitigation measures that can be taken in each agricultural sector? I will start with the witnesses who are in the room before I bring in those who are online.

Andy McGowan (Scottish Pig Industry Leadership Group): I represent the Scottish pig sector. We are responsible for about 3 per cent of agricultural emissions. After chicken, pigs are the second biggest source of protein for Scottish consumers, providing the equivalent of about 45 days of Scottish consumers' protein needs each year.

We have reduced our global warming potential by just under 40 per cent in the past 20 years. It is also worth noting that the sector is very market led and less than 2 per cent of the emissions reductions have been as a result of Government policies. Rather, the reduction in global warming potential has come from improvements to production in areas that are win-wins as they are also economically beneficial to farmers—for example, improvements in health, genetics and what animals are fed. We feel that this is an example of where we can square the circle between what the public wants, which is reductions in emissions and high-quality food, and the ability to keep sustainable farming businesses. That is why I have been so keen to get involved in the process.

Jackie McCreery (Dairy Sector Climate Change Group): I represent the dairy sector. Your question was about the emissions that our sector contributes. Dairy accounts for about 16 per cent of the 18 per cent of emissions that agriculture is responsible for. In the main, 45 per cent of our emissions come from enteric fermentation, which is the methane that is produced by cattle. The next biggest source of emissions is manure management, which accounts for about 20 per cent. Those are the two main areas that dairy farming could look at in order to mitigate and abate our greenhouse gas emissions.

Enteric fermentation produces methane, which is a flow gas and is short lived in the atmosphere, so it is quite different from other greenhouse gases. There is some academic debate on how that is dealt with when emissions are looked at. For the purposes of the greenhouse gas inventory, all greenhouse gases are reduced to carbon equivalents, but some gases have a longer life in

the atmosphere. Methane is a big area that the dairy sector needs to look at and there are mitigation measures that we can put in place around it.

Andrew Moir (Arable Climate Change Group): I represent the arable climate change group. The arable sector is responsible for 1.6 million tonnes of carbon dioxide emissions, or 21 per cent of total agricultural emissions. Around 60 per cent of those are related to nitrous oxide, which is derived from fertiliser and soil management. The remainder comes largely from CO_2 that is emitted by farm vehicles.

We came up with 43 ways of mitigating the effects of nitrous oxide and carbon dioxide emissions, which are well documented in the paper that the group produced very quickly three years ago. However, times have changed since then because of our judicious use of nitrogen and good use of the technology that is at our disposal. The 21 per cent figure is coming down. There are a multitude of things that we can and will do, given the right incentive and the right investment, so that we can do better. We should be paying a lot of attention to nitrous oxide, particularly in relation to fertilisers.

Jim Walker CBE (Suckler Beef Climate Group Programme Board): I hope that you can hear me. I am speaking to you from Sydney, where it is currently 27 degrees at 8 o'clock at night. I spent some time today in Coles, which is a multiple retailer along the lines of Tesco that operates across Australia. Interestingly, on sale was carbon-neutral beef from the suckler herd of Australia. Scotland likes to portray itself as being first in class with a world-class beef industry. However, while we are still talking about it, the rest of the world appears to be moving on and leaving us behind.

My interest in the subject started back in 2019, when I was asked by the then cabinet secretary, Fergus Ewing, to try to recover funding for the Scottish Government from Westminster. That was in relation to the convergence funding debate that went on between 2013 and 2019, which I am sure you guys talked about here in committee. A committee was set up that was chaired by Paul Bew. It became known as the Bew committee. After quite a lot of work, we managed to secure £160 million of back payments in convergence funding, and we also recovered £26.7 million a year, which is still in place today.

Why did I bring that up? One reason why I agreed with Fergus Ewing that I would get involved with that recovery and the injecting of new money into Scottish agriculture was that some of that funding would immediately be transferred into actions in this area, and specifically in the beef sector, which at that time contributed some 60 per cent of the emissions from Scottish agriculture. As Jackie McCreery set out, that was mostly because of methane produced from enteric fermentation, and a fair proportion of the rest was from manure produced by the animals.

At that time, we produced not only a report of some 40,000 words—Claire Simonetta, who is also attending this meeting, was instrumental in helping to put that together, along with me—but a scheme that was ready to roll two years ago. I note that £16 million of funding from the Bew review could have been allocated to that and it would have given the beef industry a start. We did not just come up with ideas that were nice and cosy for farming.

That scheme could have been put in place. It could have been paid for and delivered through existing scheme mechanisms, taking into account the Scottish Government's wish to stay within European Union legislation, and it was similarly compatible with the Department for Environment, Food and Rural Affairs and World Trade Organization rules. However, the scheme was torpedoed and it remains underwater to this day. The problem in the intervening—

The Deputy Convener: Jim, that is helpful background information, but can I bring you back to the question that I put to panel members? Will you indicate the key areas of emissions reduction and mitigation measures in your sector now?

Jim Walker: My reason for giving you that introduction is that the industry has moved on significantly in the three years since 2020, and not in a good way. There has been a significant reduction in the number of suckler cows in Scotland due to the economic circumstances that we find ourselves in and the increased Government regulation on the herd.

The first mitigation measure is the one that Scottish Government officials have favoured from day 1, which is a significant reduction in the number of animals. That takes no account of the economic impact that it will have across the country or the potential to offshore the emissions from Scotland to other countries—notably Ireland—that continue to support their beef sectors. I will come back to that later in the discussion.

09:15

Secondly, as Andy McGowan said in relation to the pig sector, the most important thing is to make your herd, whatever it might be, as efficient as possible. The more efficient we are, the fewer emissions we will produce.

Perhaps, without taking up a lot of the committee's time, I can bring that into focus by giving you an example from what has happened in our own farm business. In each of the past three years, we have been doing four trials, with 80 animals in each trial all eating in hoppers. We know every single morsel of food that they eat and every litre that they drink. They are high-performance suckler animals that provide an average 1.5kg of meat a day. In other words, their weight gain is 1.5kg.

The trial has shown us that, although they are all well-performing animals, the best performing eat 2.5kg of food to produce 1kg of weight gain a day, while the poorest in the same trial group eat 15kg. That is interesting for two reasons. First, if animals eat less food, it costs less to finish them, and they will finish more quickly. Secondly, there is absolutely a direct correlation between the efficiency of meat production and the amount of emissions from those animals, whether that is short-life methane or anything else.

We have been working with the University of Glasgow on this, and we have put hundreds of animals through the trial. In the same trials, we have also done methane inhibitor work, and in the past year we have put in place methane measuring equipment to underline and indeed prove the algorithms that the university uses to show how much methane is produced. In short, the animals go into hoppers; as they feed, they burp; as they burp, the machines measure it; and we can absolutely correlate what is happening.

Those things are happening out there. The problem with where we are at the minute is that putting out lists of things that farmers can do without specifying the outcomes and the base year or other base information from which they start does not take the industry anywhere.

Another thing that we can do is, as Jackie McCreery said in relation to the dairy herd, to be more efficient in what we do in the fields. The Scottish Government has come up with a £500 soil analysis grant, but the soil analysis programme on our beef farm costs us £5,000 a year for a four-year rolling programme in which we do the proper soil analysis that Andrew Moir will do in the arable sector. For example, we have properly mapped fields using global positioning systems so that we apply fertiliser, manure, slurry and lime in the most efficient way and we do not waste anything. Once again, that approach has a double impact of super-efficiency in terms of money and more efficiency in general.

Those are some of the things that are really happening out there in the real world. In fact, other countries have already adopted those types of technological improvements. The world has moved on so much in the past three years, since we started doing these things and writing these reports, that it is frankly embarrassing—

The Deputy Convener: That is true, Jim, but I have to interrupt you, because we have quite a lot of questions to get through. I will bring in Claire Simonetta next, after which there will be quite a lot of supplementary questions.

Claire Simonetta (Hill, Upland and Crofting Group): Thank you for the invitation and for having me here today. I represent the hill, upland and crofting group. I note that, unfortunately, the two co-chairs could not attend the meeting.

Jackie McCreery summarised the situation eloquently by saying that the science is still behind the curve. At the moment, we have an emissions inventory that does not properly calculate emissions or capture the atmospheric longevity of methane. It needs to be updated before we can really calculate the exact impact of ruminant livestock, which is the main production system in hill and upland farming and crofting areas. It needs to be brought up to speed.

As for what we can do, I note that hill and upland crofting and farming are quite extensive and our low reliance on external inputs means that our fossil fuel use is probably lower, as a proportion of the total farm business, than that of other sectors. The same can be said of the use of fertilisers, for example. That means that our big source of emissions is methane, with carbon dioxide and nitrous oxide featuring to a much smaller extent. As others have mentioned, enteric fermentation and manure management are two key areas where we can make a difference.

Animal health and welfare have been highlighted both by science and by experience in the farming world as having a significant impact on animal efficiency. If animal health and welfare are maintained and safeguarded, the animal is much more able to use inputs and feed efficiently. Any sector, regardless of whether it is intensive or extensive, can do a lot of breeding, but the breeding outcomes and targets are slightly different in extensive systems. We cannot just focus on producing animals that are more and more productive, because the environment cannot support it and we would end up with a system that had to rely on inputs.

Extensive systems want to work with an animal that is suited to the environment—one that is resilient; is hardy; has a good genetic score for stayability, which means its longevity; and has a good feed conversion rate. Actually, the latter point applies to any system. We then have a resilient animal that is suited to the environment: one that can thrive in the harsher environment on the hills and uplands of Scotland and, therefore, can show better efficiency in those areas.

At the same time, that animal will be beneficial for the environment, which is not captured in the inventory. If it is managed properly, targeted livestock grazing can make a huge contribution to the climate solution because, if those animals graze our fragile and important habitats—including peatlands—properly, they can help to maintain the carbon stores that we already have in the ground. By maintaining properly growing vegetation in those areas, they can also help to sequester more carbon into them.

I will leave it at that.

The Deputy Convener: Thank you, Claire. Several members have questions, but I note that Jackie McCreery wants to comment on what has been said.

Jackie McCreery: We all represent our own sectors, but I note that there is a lot of commonality between them. As Jim Walker said, the beef suckler sector went ahead and reported first and we all looked at its report as we did ours.

You asked about the measures that we can put in place, convener. Many of them are common, partly because many farms in Scotland are mixed farms. There are very few single-sector farms. In addition, many farms are diversified, so they have other business interests, and there is an issue with measuring their carbon footprints. Of the 64 tools that are available, I am not yet aware of one that can measure the true carbon footprint of a mixed, diversified farm.

In the dairy sector, we put the abatement measures under six headings: genetic efficiency, feeding efficiency, energy efficiency, herd and health management, grassland management and nutrient management. As you can see, those apply not only to the dairy sector but to many others. Underneath them, we set out a number of subheadings and measures that we felt could help.

The difficulty that the Scottish Government—or any Government—has is that there are hundreds of measures that could potentially mitigate and abate greenhouse gas emissions, but they need to be tied back into the marginal abatement cost curve. A lot of academic research has been done on that. They have to be tied back into the inventory.

It is not an easy job to identify measures, but we managed to identify quite a few, as laypeople, in the five reports that we produced a couple of years ago. What we have in the route map from the Government is to some extent a regurgitation of what we have already done and what is already available. For two years of work, it does not necessarily give us a huge leap forward. I find it a bit disappointing that that is where we are two years later.

Rachael Hamilton (Ettrick, Roxburgh and Berwickshire) (Con): I will comment on what Jim Walker and Jackie McCreery said. I cannot understand why, when the farmers want clarity and want to understand the future of their farming enterprises, the proposals from the climate change groups were not initially implemented. That remains a mystery to me.

I am interested in two points. First, are the current measures to reach net zero sufficiently supported? Are farmers sufficiently supported by the Scottish Government to implement them? Secondly, how can the proposals for the tier system in the proposed agriculture bill support Scottish farmers to maintain livestock numbers to meet consumer demand while remaining viable and achieving the net zero targets?

Andy McGowan: The answer to your first question about whether the measures that are currently in place are sufficiently supported is no. That is mainly because we have not really changed anything away from the old system, yet.

I should declare that I am involved with the ARIOB. Do not ask me what those five letters stand for, but we have been getting involved in that and have tried to keep in the spirit of it. I would say that that process could bring about a mechanism that will drive the change that we all want. However, there are a number of areas where there are decisions to be made and, if the right decisions are made, that can drive that change, but if they are not made, it cannot do that.

All five of the reports and some of the previous work took an outcome-based approach by treating farming businesses like grown-ups and not saying that they need a 10,000-page rule book and a team of inspectors going round, measuring their fences and ensuring that they are complying to the rule book to the nearest inch. We do not do that with any other business.

I run a farming co-operative, so I can apply for a grant scheme and there is a broad set of objectives for that grant, which means that, if I make a proposal to that scheme and deliver against those objectives, I receive the grant, but if I do not deliver against them there is a clawback mechanism. I go into that with my eyes open and say, “This is what I am proposing to do and, if I do not deliver it, feel free to take the money back off of me.”

Farming businesses—my members—are the only ones that we do not seem to treat in that way, which seems to say that they need that treatment to ensure that they comply. The problem with designing a rule book is that someone will come up with a good idea the day after we have published it, and it will not fit. Instead, we should

take more of an outcome-based approach, which was the concept behind all of the reports.

We all want to reduce emissions to net zero, we all want to keep producing high-quality food for Scottish consumers and we all want to enhance biodiversity. There is no debate about that in the farming industry, in this room or in wider society. The question is how we do it, and we have a once-in-a-generation opportunity to come up with something innovative and different, but it should involve less of the Government and its representatives and be more about officials having a certain level of trust in the businesses that they oversee. They can say that they will design things and put them in place, but then they need to step back from it, a little bit.

If we write a very prescriptive rule book, it will be wrong and will underperform in delivering the outcomes that we all want. Can the measures make a change? Yes. Should it have happened sooner, as Jim Walker said? Yes, probably, but we are where we are. Can we get it right? Yes, with a bit of urgency.

Jim Walker: The answer to Rachael Hamilton's question about whether current measures are good enough is, "Absolutely not." The only word that I can use to describe them is "embarrassing". They include soil sampling with undefined outcomes, a carbon audit for farms that are not really quite sure what they will do with it once they have it and an animal health and welfare plan—which is interesting, because we have been doing them for years. The outcome of all that is that, so far, 219 out of 15,000 eligible farmers have applied to the national test programme that specifies those measures.

In my farm business, the latest announcement at the National Farmers Union conference suggested that, with the addition of £250 to get a vet to write a health plan, my business would be eligible for £1,250 over two years for all these new initiatives. We keep hearing that we have a climate emergency, but that £1,250 would not even pay for the disinfectant that we use while we calve 700 cows per year. The current measures are definitely embarrassing, and there is no way on earth that they will make any difference to what is happening in the real world that we are all living in.

09:30

The problem with what has been published is that a legislative timetable was published at the same time as the latest announcement about the £6 million, which is rehashed money that was already in the pot. Officials are working toward that legislative timetable, but it gives ordinary farmers no indication at all of what part they could play in that or what outcomes they need to be involved in and are shooting for. In every sector of farming—dairy, beef and arable—and across the country, every single farmer on every step of the ladder, from those on the bottom rung to those on the top, can do something. However, if they do not know where they are starting from, there is no way that they can do anything sensible or measure the benefits of all the activities that have been published.

I am afraid that the Government and its officials have got this completely upside down. They have published lists and lists of very interesting things that came from work that we and others did. None of that is rocket science and it is changing all the time—I have given two small examples of what we are doing on our farm. However, there is no structure, so we are going to waste another two, three or four years until 2027, which will leave only three or four years for real actions and outcomes.

In the beef sector, an animal is at least two years old before she has her first calf. There simply is no time to make the kind of changes that we need. Beef farmers in particular are operating in a total vacuum and against an economic background of the highest fertiliser prices, feed costs and fuel costs in history and the best prices for cull animals—cows that we are finished with—that we have ever seen. So, what happens? Farmers are culling animals like there is no tomorrow, partly because they cannot afford to keep them and partly because they are getting the best price that they have ever had. In 2003, when we were throwing animals older than 30 months into the burner, they were worth £200 each; now they are worth £2,000. When we wrote the report in 2019, clean beef was worth £3.20 a kilo; today even cow beef—cull beef—is worth £4.20 a kilo.

The numbers of animals are very quickly shrinking as we speak. Once the beef industry in Scotland loses its critical mass, that will have a fundamental impact, and not only on beef farms, which will continue to farm something—either trees, sheep or arable, but probably trees. The downstream and upstream industries that rely on beef farms, and the millions of pounds generated for the Scottish economy by the beef sector, will simply disappear. Once those have gone, they will never come back.

Rachael Hamilton: I will bring in Jackie McCreery to allow a fair balance of voices.

Jackie McCreery: I completely agree with what Jim Walker just said. You asked a two-part question. You first asked whether current measures are sufficiently supported. As Andy McGowan said, we are where we are. The test programme allocated £51 million to a starter programme including soil sampling, carbon auditing and that sort of thing. That is a good start. As Jim said, we need a baseline, so every farm in

Scotland should be carbon audited. Two thirds of dairy farms have already been audited. They have done that for various reasons, perhaps to tick a box as part of a process, and they do not all have action plans coming out of that.

We need to have everyone carbon audited. The test programme provides some support for that, but it is my understanding that uptake has not been as good as it might have been, perhaps because of a lack of capacity in the advisory firms. We must ensure that we are using a consistent tool. There are about 60 tools for measuring carbon, but Agrecalc seems to be as good as any. Those measures need to be supported.

I have another point about support. We should try to move away from that term to talk about investment instead. This is a global issue. I cannot think of two more important things than feeding the population and preserving the earth that we all live on. Those are not party-political issues; they rise above many other issues. That is what farmers are tackling.

I do not have the 2022 figures but, in the dairy sector in 2018, only something like 60 per cent of dairy farms were profitable. That includes farms' support payments—

Rachael Hamilton: Did you say 60 per cent?

Jackie McCreery: Yes. Even then, the profit, on average, was something like £24,500. That amount is not enough to maintain the people on the farm and invest in climate change measures. We are not talking about support; we are talking about investment for the future of the planet. We are talking about investment to feed a growing global population.

That takes me back to your second and well-made point, on the tier system. There are conflicting challenges. Sustainability in farming is not just about net zero; it is about maintaining populations in rural areas. As Jim Walker said, the cows on the hill have more than one purpose. We need to maintain a critical mass. Those conflicting challenges will be difficult. The tier system looks fine, on the face of it—it is as good as any other system could be—but the problem is the budget; we do not know how the budget will be allocated between tiers. We have been told that at least 50 per cent of support will be used towards targeted outcomes. That is good language, because we like to have outcomes to work towards when we are dealing with competing challenges, but we do not know how much money is in the pot and what will be allocated to each tier. Without that information, it is almost impossible for us to give an intelligent or coherent response to your question.

Rachael Hamilton: We had better leave it there. Thank you.

The Deputy Convener: I will bring in Claire Simonetta before we move on to the next question.

Claire Simonetta: A lot of what I was going to say has been said by Jim Walker and Jackie McCreery. I reiterate the point that Jim made: the drive to cut beef or ruminant livestock numbers is not sustainable. We need to think beyond just ticking a box on a piece of paper. The issue goes beyond the boundaries of Scotland; it is a global issue, as Jackie said, and reducing livestock in Scotland is not a real outcome if we then just export our food production and the associated socioeconomic and environmental benefits, so that we offshore our emissions but import produce from other countries, where environmental, social and animal welfare standards might not be the ones that the Scottish Government and Scottish society demand from their producers. We need to think about that. I know that it is a big challenge, because targets on paper have to be met, under the current inventory.

The measures that are currently in place are a start, but more is needed. We really need to move on. The problem is that, although the measures are being introduced, we still have in place a support payments system and framework that is not fit for purpose. A particular issue is the application of payments to historical activity. Some farms receive support payments for activity that they carried out 20 years ago. That is simply not right, when new entrants, young farmers and growing businesses are being forward thinking and working efficiently but are locked out of getting full support payments. That stifles progress and improvements to make businesses more efficient.

That is especially the case when it comes to rough grazing areas in the hills and uplands of Scotland: our support payments are tied to livestock numbers, and livestock numbers are typically used with historical reference. That means that, if I want to improve the efficiency of my herd by dropping the number of cows by a dozen or two dozen in one year, so that I can get cows away that are not efficient and slowly build up stock again from more efficient bloodlines, I cannot risk doing so, because systems rely so much on income support and I could be locked out of support payments for many years. The support payments system does not support improvement and efficiency-driven decision making.

The Deputy Convener: Thank you. I am conscious that we are only just moving on to question 2, although we are almost halfway through this part of the meeting.

Alasdair Allan (Na h-Eileanan an Iar) (SNP): You have given us a clear picture of some of the challenges that you think that there are sector by sector in achieving our shared aims in emissions

reduction. In what you have said so far, you have been concentrating on examples of what is happening and the challenges ahead, so it is perhaps more difficult to tell how far you have to go and what mainstreaming would look like in your sector. What would the mainstreaming of the things that we are trying to achieve with carbon emissions look like in your sector, and how far away is it?

Andy McGowan: I realise that I did not answer something in the first question. Our two biggest problems are finding an alternative protein source to soya, and manure in slurry management.

In answer to the question about what mainstreaming looks like, therefore, it certainly means the elimination of any soya linked to deforestation and, ideally, the use of alternative sources of protein altogether. That has technical challenges, as soya is nigh on the perfect vegetable protein in terms of its nutrient balance for a pig's diet. That is why it has been so difficult to remove, but we can certainly do a lot about sourcing it, and the commercial supply chains are doing a lot of work on that. Tesco, for example, has already declared that it wants soya out of all of its supply chains by 2025, so I suspect that things will move quicker—it is not going to need a policy to make that happen; the private sector will force it.

The second part, on slurry and manure management, is probably where we are interested in the public sector side. We need to cover every slurry store in the country, and that costs money. While the pig sector is trying to address that issue, it has had a generational meltdown caused by a combination of Covid, immigration policies and losing China export licences. You could not make it up, but the long and the short of it is that Scottish pig farmers have lost more than £100 million in 12 months. The idea is that they are going to spend money off their own backs putting lids on slurry stores in the next year or two, but that is just not going to happen, because they are about to lose their houses and they are more interested in keeping a roof over their family's head than they are in putting a lid on a slurry store.

There is no real return on investment with slurry storage so, if we want to make progress, there is a need for some public investment. That is what some of the grant schemes across sectors have been about, and that is to me where the solution will come. I was slightly disappointed that the budget given to the agricultural transformation programme for the next couple of years seems to have dropped from £40 million to £5 million. Now, if that is the scheme that I think will be used as a mechanism to incentivise people to do things such as improve slurry and waste management, £5 million spread across 20,000-odd farms is not going to get us terribly far. New slurry stores are about £0.25 million each in the pig sector. I could use the entire budget, and it would not even solve the problem for the pig industry, and we are a very small part of the industry.

Andrew Moir: The arable sector is in grave danger of leaving the Scottish Government way behind. That is where we are. We are at the top of the curve compared with the Scottish Government, which is down at the bottom. We are leaving the Scottish Government way behind on the things that we are doing. I just want to make that point clear. The Scottish Government is in grave danger of losing any kind of control of farming at all, if you want any control of farming from these guys. We are trying to stay ahead, and we are staying ahead because we are investing. Jackie McCreery used the right word. The Government needs to invest, because we all know that every pound that goes into farmers' pockets is spread upstream and downstream.

As Jim Walker said so eloquently, once these areas are gone, they are gone. We must remember that. We also need to remind the committee that Scotland's food and drink ambition of £30 billion has to be produced. That is production, and we are about production. It has to be a big part of that ambition. We have to produce for the nation.

Alasdair Allan: This is not meant to be a provocative question. Is that because the arable sector has more means than other sectors to invest?

Andrew Moir: No. I would say that we are just a bit further ahead of the game and on the use of some of the technology. I would not say that we have more means, although we had a couple of good years; I will not deny that. Prices have been good.

It would be easy for you to say that we should stop using nitrogen, because that would cut 80 per cent of our emissions, but it would also automatically reduce our yields by more than half, and that would automatically make our carbon footprints a lot higher.

Arable farms have been well aware of that for many years. I have been using global positioning system technology for more than 30 years to target lime, fertiliser and nitrogen. I use the green area index with satellite technology to put on the proper amount in the right areas, with absolutely no waste.

09:45

What I am trying to get across to you guys is that you are in danger of being left so far behind, with no control over what you are trying to do. We

are doing more, because we can, but we need investment, and I will explain why.

We can use green nitrogen—it can be done—but it costs about five times more than nitrogen costs just now. Investment in producing nitrogen from a green source can be done, and it is being done at present. Again, however, that takes us back to the word "investment". The Scottish Government has to invest in these technologies to help us to utilise them and still produce. We have still to be able to produce, or else there will be no businesses—they will not be there—and the Scotland Food & Drink ambition will become an impossible target to meet.

I want to make that clear to you all.

The Deputy Convener: I will bring in Jim Walker and then Claire Simonetta.

Jim Walker: In answer to Alasdair Allan's question, we are in exactly the same position as the arable sector. We are trying hard to do things properly. New technology is now being used across an increasing number of beef farms, as I explained earlier, concentrating in particular on efficiency and feed efficiency. Those with dairy herds and pig herds have been doing that for years, and it is starting to happen for us now.

The whole point of the scheme that we produced, or of what we tried to get introduced through the scheme, was that it took a carrot-and-stick approach. Beef was to be first, with the rest following; Jackie McCreery was right to say that all farms, including mixed farms, need to be involved. The carrot was about what you have to offer farmers to get them involved to start with. It is clear that what has been offered so far is meaningless and that farmers do not want anything to do with it, because only a few hundred, out of thousands, are involved. The stick was about the regulatory requirements and the cross-compliance that would be involved with the various tiered payments.

Alasdair Allan asked what mainstreaming is going to look like. It will mean that a big proportion of the farmers who are currently active and producing food will not be producing food by 2030, once the cross-compliance and regulatory requirements come into force. That is simply because there is not enough money in the job to allow them to make the capital investments that are required, for example in slurry storage, which has been mentioned already.

It does not help that the Scottish Government still has £72 million of underspend from two years ago sitting in the kitty because civil servants could not get it out the door. I am astonished at that—in my 40 years of involvement in various sectors, the whole point of civil service departments was, and is, that they actually get the money out the door and spend it on their sector because they are interested in it going somewhere. They did not manage to do that, even though their numbers have increased—there are more than 1,100 of them, costing the taxpayer £70 million in salaries a year.

Secondly, John Swinney decided to take £33 million off the farming industry in the budget, for no particular reason other than that he wanted to do so.

Thirdly, I have no idea what happened to the extra £26.7 million a year that I got when I bothered to go and do some work for the Scottish National Party Administration on the promise in the programme for government two years ago that the Scottish Government would introduce a suckler scheme and follow on with schemes for the rest of the country.

Fourthly, the food processing, marketing and co-operation grant scheme has been shelved for this year, which shows the commitment to the Scotland Food & Drink policy for 2030.

The problem with all that, in my view—as I sit here in Australia, watching carbon-neutral beef being sold on the shelves of supermarkets, and being proud of it—is that we sit around authoring press releases and talking about the stuff, but the Scottish Government officials who are responsible for agriculture refuse to engage in proper policy discussions that would set up a framework to allow outcomes to be defined. If they did that, they could then announce all the soil sampling and carbon audits they like.

At the moment, however, the approach is so infantile that it will take our country nowhere, and the mainstream will disappear. Only 70 per cent of the farmers who are currently farming will be farming in 2030; half of them will be producing food and the rest will be doing something to do with forestry or the environment.

Looking at the cattle numbers that are currently going off, I reckon that we will have lost 20 per cent of the Scottish suckler herd between 2019 and 2022—

Alasdair Allan: Convener, can I ask—

The Deputy Convener: Jim, could you hold on?

Alasdair Allan: As important as those issues are, perhaps the person to whom we are speaking can, before he finishes, address the question that I asked: what is the distance to mainstream?

The Deputy Convener: Sorry—I missed that.

Alasdair Allan: I asked Jim Walker what the distance was to mainstream. I do not know what the distance is to the end of his contribution, but maybe he can address that point before he finishes.

Jim Walker: Okay—the distance to mainstream is that 80 or 90 per cent of the industry is a country mile away from it. The whole point of doing what we, as various groups, suggested two or three years ago was to get the best-performing and most forward-thinking farmers to offer ideas to the rest of the industry. We would then have a five-year or six-year transition period to enable the rest of the industry, with continued farm support, to at least get the opportunity to make a start, so that they could start to catch up and offer a meaningful contribution to emissions reduction.

The fact that we have lost three years already, and are about to lose another three, means that those who make up that 25 or 30 per cent of the industry will never get the chance to be mainstream. They will be forced out. That is not my opinion—it is an absolute fact. Mainstream is—

The Deputy Convener: Thank you, Jim. We will move on, as we are short on time. I have Claire Simonetta and Jackie McCreery still to come in, and Ariane Burgess wants to ask a supplementary.

Claire Simonetta: Jim Walker has again mentioned a few points that I was going to make, so I will try to keep my comments short.

With regard to achieving mainstream in our sector, that depends on what you actually want. We have spoken only about emissions, but hill and upland farming and crofting systems have never been about just one aspect. We have always delivered many multiple public benefits, alongside food production, although that is obviously the core activity of those businesses and should remain so. The issue is not just emissions but sequestration and biodiversity. Those things go hand in hand, so we have to be careful to make sure, in debating them, that we do not talk about them in silos.

Just now, it is not that businesses do not want, or are not trying, to be mainstream. It is the legislation and the policy that are restricting them from getting to where they want to be, along with a lot of outside factors that they cannot influence. For example, we need support schemes that are better at facilitating.

At present, to give just one example, we have the agri-environment climate scheme, for which the application process has become unbelievably difficult. I am a farmer, but I am also a consultant, so I complete the applications for people. What is involved in those applications is unbelievably challenging for the farmer, who then relies on an adviser to do all that work for them. The scheme is very competitive, with a restrictive budget, which means that many people do not get in.

We see that time and time again with schemes such as AECS, or even the sustainable agriculture capital grant scheme, which offered grants for technology for efficiency and emissions reduction. That scheme was heavily oversubscribed because farmers wanted to make those improvements. If the system is not in place to allow them to access the funding because the budget is too restrictive or the application process is too difficult, that is a bigger issue that needs to be tackled. It is not that farmers are not willing to improve what they are doing.

Jim Walker mentioned knowledge transfer, which is important. It is currently hugely difficult to achieve, however, because we do not have industry champions—as Jim mentioned—and the systems that are in place are not operating optimally. We need more advisers, but the hill and upland farming and crofting sector specifically is lacking actual best practice and technology that is applicable to our systems.

On my farm, we do a lot of trialling. We analyse genomic profiling of our cattle, and we adopt a lot of technology. Our biggest difficulty is that all those things are not yet quite fit for purpose for our systems, so we spend a lot of time having to tweak them to make them relevant. Until they are workable in those extensive systems, you cannot expect farmers to adopt them or even to get a benefit from them, because they are not fit for purpose just now. There is a huge opportunity to put more time and effort into developing best practice and technology that can be adopted by any sector.

Jackie McCreery: I will try to be brief. It is difficult to know what the distance to mainstreaming is, because we do not know where we are starting and everyone is starting from a different point. There will be some farming systems and farms in all the sectors for which greenhouse gas reduction is mainstream in the business. We suggested, not just for the dairy sector—I think that this was common to nearly all the reports—that a baseline be created so that we know what that distance is and that each farm has an action plan for how to get there.

That has been picked up in the Government's route map without detail—again, more detail is needed. We suggested that every farm should go through some sort of whole-farm review that examines every aspect, not just greenhouse gas reduction. That would involve looking at things such as a carbon footprint audit, a training needs assessment, a feeding strategy, a health and fertility plan and a soil management plan at a farm level. Each farm would then have a distance to mainstream, but at least that would be identifiable and we would all know where we were starting from.

Those plans would then unlock future funding and investment, where that is needed, because

they would identify the gap. It is almost like a gap analysis, but it would be a living document that would be reviewed and renewed as the farm progressed through the action plan towards its specific outcomes. The outcomes would be specific at farm level. Not every dairy farm would have the same outcomes, because they will be starting from different places.

The other point to note is that good practice that is already being followed should be rewarded so that those who are already on the journey do not suffer a disadvantage.

Ariane Burgess (Highlands and Islands) (Green): I will direct this question because of time. There are two parts to it. I will direct the first part to Andrew Moir, because he is representing the arable sector, and possibly also to Jackie McCreery.

Last week, the committee heard that organics need to become part of the mainstream. I would be interested to hear your thoughts on that in the context of the arable sector. I understand that 20 per cent of what we grow in Scotland is food for people but 80 per cent is used for whisky and feed for animals, so there is the potential to support other sectors if we feed animals with organic feed.

Andrew Moir: Let us be clear: organic is fine and it has a niche market. The Scottish Government's ambition is to go higher. I do not think that that is possible, because the business is not there to do it. Because the produce is organic, the cost will be too astronomically high for the people who want to buy it.

There is not enough landmass to allow for organics to be mainstreamed. Yes, a percentage of farmers are producing organically and they are doing it very well but, if you increase that percentage too much, organic produce will become mainstream and, therefore, the price will be too high for the vast majority of people who might want to buy it.

Ariane Burgess: But if we take the concern about the farm gate out of the picture, from the point of view of climate emissions and so on, is the organic way of producing—

Andrew Moir: Organic is worse. The carbon footprint goes up per kilogram produced when you have organic farming.

Ariane Burgess: I will have to take that away and have a look at it, because that is not what came out in last week's meeting.

Andrew Moir: If I use less nitrogen and produce less, my carbon footprint per kilogram of production goes up. Obviously, if you take everything out, you will not be producing anything. If you are not putting anything in, you will use fewer chemicals and less fertiliser—the stuff that you need in order to produce. As I said, the nitrogen is there to help you to produce. Part of our problem is nitrous oxide, but we have a solution to that in green technology that will allow us to use nitrates, which are the only fertiliser that we can use to get to net zero. However, there is a huge cost involved in that.

I am afraid that, if you were to make all farming in Scotland organic, you would have no farming left, because there would be no business.

Ariane Burgess: Thank you for that. I will take that away and look into it further to try to understand in more detail what you are saying.

In relation to what is blocking mainstreaming, an issue that came up at last week's meeting was around tenant farmers and the fact that some farmers have less than a year in their tenancy. Maybe Jackie McCreery could address that issue on behalf of everyone. If you have a short-term tenancy, it is difficult to start taking up some of the measures that we are talking about. Do we need to be looking at a different form of tenancy or at something to support people so that they feel that they can invest and move forward with the longer-term programmes?

10:00

Jackie McCreery: That can certainly be an issue, particularly in the dairy sector, where a lot of capital investment tends to be needed, because we need lots of big, expensive kit to increase our efficiencies. That certainly needs to be looked at.

The tenanted sector has a long history in Scotland and there are a lot of issues that have always seemed to be there and have not changed. However, we could maybe look at opening up the whole area of tenancies and, as Andy McGowan said, look at treating people as grown-ups who can freely enter into contracts that are less restrictive than what we have in place at the moment. We could allow people to do other things with their businesses and treat farmers as businesspeople.

We have a historical system for agricultural tenancies that was a post-war thing; the whole situation has changed since then. We need some sort of freedom for farmers to enable them to enter into contracts that allow them to do what they need to do. That might include more environmental-type operations, as well as the ability to invest and know that that investment will not be lost.

Andrew Moir: I add that we are in grave danger of offshoring all our food and stuff. If we go all organic in Scotland, we will offshore the problems elsewhere. We will not have any control at all. That is the real problem with going all organic—

the production will not be here, so we will be offshoring all our emissions somewhere else.

Jackie McCreery: I would like to make a short point on the organic question. My view is that there is a place for all farming systems—intensive, extensive, organic and non-organic. What we need is for all those systems to be as efficient as possible, because efficiency will reduce carbon emissions. If we look at herd health, for example, there is a place for being able to treat animals with antibiotics, but the less you have to do that, the less wasted milk there will be, because all that milk does not go into the food chain. Efficiency—as opposed to what the farming system is—is the key. Our group was made up of all sorts of dairy farmers.

To come back to Andrew Moir's point, it depends on how you look at it. You will get a different answer depending on whether you are talking about carbon per litre of milk or carbon per area. We have room for everyone to farm in Scotland, as long as they are doing it in the best way that they can and as efficiently as possible.

Andrew Moir: Sri Lanka went all organic virtually overnight and the country is in a terrible state now. If you look up what has happened in Sri Lanka in the past year or 18 months, that will give you a good example of what the unintended consequences can be.

The Deputy Convener: We will have to move on. Jim Fairlie is next.

Jim Fairlie (Perthshire South and Kinross-shire) (SNP): The frustration that I have with this session is the fact that we are speaking to representatives of five different sectors all at the one time. Those sectors all have different baselines and different required outcomes. We could have had a session with each of you, because the picture is just too complex.

However, I will try to be as concise as I can be, because we are short of time. Jackie McCreery talked about having a baseline measure. How do we get one, given that different farmers are starting at different levels across all sectors? How does the Government find a baseline level to work from? Andy, I will start with you, because it is clear that you would like to respond.

Andy McGowan: There is a simple solution to this, which could be done now. We are paying for individual farms to measure the carbon footprint. There is no system to collate the results of each of those individual carbon footprint measures into a single national number. With a bit of thought, one person could probably come up with a way of collating those results and giving us an annual baseline figure.

Jim Fairlie: How do we do that, if farmers are not taking up those measures? The farmers have to participate so that we can get that baseline measure, in order to allow us to start.

Andy McGowan: They do, but I suspect that several thousand farms in Scotland have done a carbon footprint exercise in the past two or three years, although most of them have not done that through the Scottish Government scheme. For example, in the pig sector, only 14 farms have not done a carbon footprint exercise: everyone else has done it.

I can collect that number on behalf of the pig sector and give it to someone but, as you said, the pig sector is only one part of farming. Farms in the dairy sector have also had their carbon footprint done. There are flaws, and we might not be comparing apples with apples, but collating what has already been done would be a good start.

Jackie McCreery: What Andy McGowan said is correct. A lot of farmers have begun the journey, but the problem is that they will have used different calculation tools. The data that has been collected might have been used in different ways, for different reasons. The Scottish Government needs to have a consistent baseline so that everyone is audited along the same lines. That might lead to a bit of duplication of effort for some farmers, who might have already collected such data for their milk processor, for example, but it is important that the data is collected and used to influence the inventory.

There is definitely a role for the Government to play in supporting farmers to do that, perhaps through tier 1. Collecting the data must be simple and easy to do. Our report says that that must be accompanied by a communication strategy. Farmers need to understand why they are doing this and the benefits of doing it. That is the bit that is missing. There will be a bit of a cultural change or a head shift for some farmers. We spoke about mainstreaming. This needs to become a core part of every farmer's business. The Government definitely has a role in that, and communication is one of the starting points. There is no point in issuing schemes if no one knows about them and no one understands why they are happening.

Jim Fairlie: Andrew Moir, what is your view?

Andrew Moir: I have a problem with carbon audits. There are four tools that the Government has said that we can use, of which Agrecalc is one. I did a carbon audit 30 years ago. They have not moved enough with the times.

Jim Fairlie: Who has not moved enough with the times?

Andrew Moir: The carbon audits. "Reward" might not be the right word, but the audits do not

take proper cognisance of what farming is doing. I can give you a couple of examples. Grass was not audited at all; now it is there. I can give you a very recent example. Until recently, hedges were not part of the carbon audit; they are now. Guess what? In the past six months or so, it has been decided that hedges are worth three and a half times what they were originally thought to be worth. You can see why farmers are reticent. If they do their audit now, what is the point? Everything is changing and they are frightened that they will not be properly recognised for what they have done, because it is not part of the calculation.

Andy McGowan is right: we have the means, but a little bit of thought needs to go into it. We should take what we have now and incentivise more people to do carbon auditing. I know that that is happening, but it is not being communicated enough. As Jackie McCreery rightly said, the comms on all of this has been appalling. The information is there. It just needs to be properly collated in order to give us a baseline.

Jim Fairlie: I have one other question, which is about diversification. I promise I will be quick.

You talk about reducing nitrogen waste. We have a massive issue with food waste in this country. A plant near where I live is turning food waste into liquid nitrogen to feed grass. Does that work on arable?

Andrew Moir: It does, but there is a problem because some buyers might not want us to use that waste. We have to be careful about what goes into the waste. If it is food waste, our distillers will not have anything to do with that because of the potential problems. Distillers might have 10, 15 or 20 years' worth of product sitting on their shelves. If someone tells them that there was a problem with something that they put on the land 15 or 20 years ago, then billions of pounds worth of revenue for the Government and for distillers goes down the pan.

Jim Fairlie: Your customers are effectively deciding what you can use.

Andrew Moir: We are driven by what our customers demand.

Jim Fairlie: I have a question for—I am sorry, I have forgotten your name.

Claire Simonetta: Claire.

Jim Fairlie: Claire, I have a question for you because you said something earlier about science being behind the curve. What do hill and upland farmers think the baseline measures should be? Does the science match what your studies have told you?

Claire Simonetta: I will start with the latter point, because the answer is a very simple no. The science lags behind. It is not necessarily that the science is not aware of its shortcomings; it is just that what is coming through at Government level is lagging behind the latest findings. We currently have GWP100—global warming potential 100—versus GWP* to calculate emissions. Once that is updated, it will give a much more honest picture of what is actually going on. Because of the way in which the inventory works at the moment, extensive systems look much less efficient when you carry out a carbon audit. That is because extensive systems rely much more on, and are influenced by, environmental factors, whereas their more intensive counterparts take place in a controlled environment, for example inside a shed, using machinery. That is not sector against sector—I am just explaining the shortcomings of the carbon audit.

The problem is that the emissions associated with all that capital infrastructure are not included in the carbon audit, whereas in extensive systems, the inefficiencies that are created by the environment influence the carbon audit outcome. At the moment, extensive systems look less efficient, even though, within what is possible in those systems, a lot of them are actually operating in a very efficient manner, at probably an optimum production level.

I come back to the earlier question about carbon auditing. Yes, it is important, but we have to be aware of the context and understand the shortcomings of carbon audits. Talking to other farmers in the hills and uplands, there is a bit of fear. They say, "Why should I do a carbon audit now? It might have an effect on my future support payment. I'm trying to do what's right for the environment. My cows are on the hill doing the job they've evolved to do, but the carbon audit does not show that." The lack of uptake is partly caused by that. Also, as Andrew Moir and Jackie McCreery said, the comms have been extremely poor.

Jim Fairlie: This is a wee diversion, but have you done any work on native versus continental when it comes to hill cattle? Is it mostly native cattle that are on the hill producing calves for fattening?

Claire Simonetta: Hills and uplands can vary quite significantly in the system used and the productive capacity of the land. Hill is a lot more extensive, so you would usually look at more native animals—either a pure native or a native cross. On uplands you will find more continental cattle, maybe with a bit less of the native influence. Where I live, it is a proper hill on an island, and our hill can support only native animals. Native animals have evolved over many

years to suit the Scottish environment. They are resilient and hardy enough to make the most of that environment.

Jim Fairlie: Going back to Andrew McGowan's point, which was that your customer has to be the end decider of what you will do, should we be grading on eating quality rather than shape?

Claire Simonetta: The EUROP system, based on shape, is certainly not working. It is making it really difficult to operate as a profitable business. On eating quality, I would go a step further and talk about the nutrition in a kilogram of beef. I spoke a few years ago about the concept of so-called empty calories, where the food product you grow does not have much in the way of nutrition because of the way in which it has been produced. That is something that we need to look at. Our targets have changed for how much fruit we have to eat each day. It keeps going up and up, which is because the nutritional content is falling. That is not good. We need to produce healthy, nutritious food. There is definitely an opportunity there.

Jim Fairlie: Jim Walker, I will come to you, but with a slightly different question. I know how frustrated you are, but please do not use up all the time.

What would be the minimum number of cows to give us a critical mass in order to keep the suckler herd viable?

Jim Walker: We are at it already.

Jim Fairlie: We are at it now.

Jim Walker: We are under 400,000 cows now—we are absolutely tiny in world terms. We have a very efficient and tough competitor right across the Irish Sea, with access to our market, called southern Ireland. I will not take up time, Jim—I will let you find it for yourself.

I suggest that you Google the suckler carbon efficiency programme—SCEP—which is what is being introduced in southern Ireland this month. It will use €256 million across the next five years to specifically improve the efficiency of the beef hub in Ireland, which relates to what we are talking about.

10:15

To be honest, I am quite pleased, because at least all the work that Claire Simonetta and I put into the report that we produced three years ago has not been wasted, as our biggest competitor is now almost exclusively implementing what we suggested the Scottish Government could do.

Jim Fairlie: I do not want to set youse against each other, but where should financial support be targeted in order to allow Scotland to maintain a sustainable farming industry and to reach the targets for climate emissions?

Andy McGowan: Not at the pig sector.

Jim Fairlie: Great. So you will get no support whatsoever.

Andy McGowan: Historically, we have not been reliant on direct payments. We have had support in the areas of knowledge, research and capital grants. One big ask would be capital grants for slurry storage. To put it bluntly, the big chunk of the money needs to go to the areas where land delivers multiple biodiversity benefits for the rural population and where quality food is produced off the back of that. So, ask my fellow panellists.

Jackie McCreery: Obviously, I would support the dairy sector. In all seriousness, it potentially needs more capital investment, because the sector does not have a surplus. A beef calf from a dairy cow hits the ground with zero emissions, because all its emissions are attributed to the dairy cow. Jim Walker may not agree, but there is massive potential for beef in the dairy sector; the sector's contribution needs to be supported. It is very difficult to split agriculture sector by sector because, as I said earlier, very few of us are single sector. However, the dairy sector will need some capital investment in order to be able to deliver.

Andrew Moir: I would definitely be putting the money into farming outcomes, not agents' fees. We are in grave danger of doing that, and it is really serious. Money must be channelled into productive, forward thinking agriculture, which will deliver the outcomes.

Claire Simonetta: You would look at what food each sector produces, as that is a public benefit, whether it is classed as such or not. Then, you would look at other outcomes, including climate, environment and biodiversity, before looking at the income support that each area needs in order to be profitable. That would give you a good idea of where the money needs to be channelled.

For example, hill and upland farming and crofting deliver multiple public benefits from disadvantaged land. Although those businesses are disadvantaged in an agricultural sense, and therefore rely more on income support, they are advantaged in terms of what they can deliver for public outcomes. That is a justification for that sector to receive support, but it is not the only sector that needs it. All sectors work together: we are interconnected and co-dependent on each other. Scottish farming comes as a package deal, so to speak, and we need a diversity of sectors in order to survive as an industry.

Jim Fairlie: Jim, I will let you have the final word—very quickly, please. Of course, I say that with fondness.

Jim Walker: Ha! We have known each other for a long time, Jim, do not worry.

Jim Fairlie: Indeed.

Jim Walker: I am not interested in sector versus sector; I am interested in investment. With a reducing cash pile, we all know that there will be less money around in years to come. Investment has to be made in order to allow the next generation of farmers to farm without relying on Government support. That is what all this is about. At the moment, it is not much better than a welfare state, and we will never get away from that unless we start looking at this completely differently.

For example, the equivalent of the equipment that I talked about that can measure feed intake, feed efficiency and methane should be available across all farms. I am not saying that all farms will take it up, but versions of it should be available or groups of people should be able to club together to get something meaningful that considers the efficiency of what they do on the farm. That is capital investment. Andrew Moir said that as well.

The second bit of it is what we do with our land. It is about looking after the soil, whether in terms of carbon audits or work relating to the pH of the soil. The £20,000 that we are spending over the next four years doing soil mapping, soil sampling and soil testing—including for organic matter, you will be interested to know—will do two things. First, because we are measuring the situation, it allows us to do targeted inputs for the individual fields and reduce their input costs, so there is an immediate financial benefit to everybody who does that. It is not some wee, nonsense £500 soil sample but proper GPS measurements—the stuff that Andrew Moir was describing earlier. That has allowed us to sell the carbon that we reduce from that land for the next five years alongside the money that we are spending. We have a £20,000 investment that could potentially yield more than £200,000-worth of benefit to the farm at today's value of carbon. Carbon will only get more expensive as things move forward.

When I set up the group to start with, it was not about Government support; it was about young farmers wanting to do things differently and how Government could enable that. Now, we are back to the same old argument about farm support, how much it will be worth and to whom, cross-compliance and all the same old chestnuts. We are still living as if we are getting prescriptive money from the EU instead of understanding what the industry needs moving forward, whether you are on the first rung of the ladder or the top one, and having the ambition to put policies in place to achieve the wonderful goals that have been set for us by people who know nothing about our industry. That is what needs to happen.

The Deputy Convener: We move on to questions from Emma Harper. I am really conscious of time. We will not get in all the questions that members have to ask. I ask the witnesses to keep their responses as brief as possible.

Emma Harper (South Scotland) (SNP): I will be really quick because a lot of information has been covered already.

I am thinking about data management and collection. Jackie McCreery said that two thirds of dairy farms have done a carbon audit. However, I am thinking about measuring other emissions reduction. There are biostimulants, such as those produced by Tricet, such as Pro-Fortis and Pro-Soil. There are also other products for emissions reduction, such as yeast-based products for ruminants like Biocell. Then there are other products such as Slurrycell, which helps to reduce nitrogen emissions in slurry.

Do we measure that kind of stuff? Do we know what farmers are using Slurrycell or Biocell? Do we know who is using biostimulants, which are not organic but are regenerative and will help to reduce nitrogen?

I will direct that question to Andrew Moir first and then Jackie McCreery.

Andrew Moir: The direct question is more for the stock sectors. However, we can and do use inhibitors for nitrogen in the arable industry. It is 10 per cent or 20 per cent more costly to use that type of nitrogen. The inhibitors are not perfect but they do not get properly measured. I do not think that they would be a positive under the carbon audit. They might be—I will need to check that. However, we can and do use them on nitrogen on our crops.

Jackie McCreery: I am not aware of data being collected on who is doing what already. However, a whole-farm review would pick up what a farmer is already doing. No carbon audit or soil sampling data is a one-off. It is a rolling programme and the numbers are reviewed, so, in three carbon audits, for example, you can see what improvements you have achieved in terms of your ultimate result. That would be a way of measuring those things.

As you say, there is a lot of technology out there. There are feed additives that are as yet not quite approved for use, but we want to be ready to use them when they are approved. If the review is a living document that is renewed every few years, the whole-farm review mechanism would be a way of measuring the improvements that are made by adopting some of those technologies.

Emma Harper: Does the way that we measure and gather data need to be flexible because of the technology and because some products are not

yet licensed for emissions reduction in dairy cattle? Am I right to say that everything has to be flexible and must be allowed to evolve as the science, technology and support enable emissions reduction by farmers?

Jackie McCreery: Yes. Tools such as Agrecalc are continually being developed. There is a whole team of people working on improving that in line with the technology. We have to get started; we cannot wait until everything is perfect. However, everything needs to evolve as the technology evolves.

Emma Harper: I know that we are conscious of time, so I can stop there.

The Deputy Convener: Thank you. Edward Mountain, I can bring you in if you keep your questions brief.

Edward Mountain: The question will be brief, but the answers may not be. I cannot account for those.

I share the sentiments that have been expressed. We do not want to have a complicated system of forms to fill out. That is not good for farmers or for agents. We do not want to move to a system that encourages the secondary users of our products to benefit by driving prices down for producers—the farmers.

My question is twofold. How do we stop those who use our products siphoning off funds that are meant to improve habitats and environments on farms? Do you think that the Government has left enough time to model the outcomes of what it is suggesting? What the Government did in 2015 did not achieve the stated aims. I put those questions to Andrew Moir and then to Jim Walker.

Andrew Moir: How do we stop them? That is the $6 million question. Jim Walker mentioned carbon. We have control of the carbon and must not sell it cheaply. The Government should legislate to prevent that. We are a net zero farm and my business is a net zero business. I will not go into detail about why that is the case, but it is. We could, and probably will, sell carbon at some point to underpin the business, but we must not be allowed to sell carbon just so that big business can say, “I am green.” It is absolutely within the grasp of the Government to prevent that from happening. That is my plea.

Edward Mountain: Jim Walker, perhaps you could dwell on that answer and think about the fact that we are talking not just about carbon. If a farmer gets X amount per acre they will be paid only Y for their output. I am sure that you have views on that.

Jim Walker: I disagree with Andrew Moir. I do not think that the Government should be legislating on the carbon market. We are in a free market and should be allowed to reduce, offset, sequester and do what we like with carbon on individual farms. It would be a backward step if Government was involved in that.

My background in biofuels was largely about patents and intellectual property. When I started with the suckler cow group, we used a patent lawyer in Glasgow and worked with Quality Meat Scotland to patent sustainably bred Scottish beef. We set a really high bar as a point of entry. People have to be able to produce data from their farm and their production system to show that they started at point X and are now at point Y and can prove what the emissions from their animals are. That is along the lines of the work that we are doing on our own farm, which I explained earlier. We are not waiting for Government, because we cannot afford to.

That leads me on to your second question. The Government has absolutely not left enough time to model the outcomes and is not even trying to model the outcomes. That is the problem. It throws out piecemeal little incentive packages every now and again while farmers become increasingly frustrated and lobby groups jump up and down saying that the progress is not good enough. There is no strategy, ambition or coherent policy. There are targets that we will be forced to meet to be legislatively compliant, but there is no coherent policy.

I can draw a comparison with the suckler carbon efficiency programme in southern Ireland that I just spoke to Jim Fairlie about. When that scheme is open, the applicants will be presented with the suckler calving data of their individual farms from 2016 to 2021 inclusive, and they can pick the best three years from those five or six years of data to make an average. That will be their base. That is what they will be measured against.

10:30

We have ScotEID setting up in the north-east, not far from where Edward Mountain is based. It has all the information in the world, it costs X million pounds a year to run, and we do absolutely nothing with that information. There is the potential to do something—as far as the cattle herd is concerned, a database already exists that would give individual farms a place to start from—but the Government cannot bring itself to even think about using it.

Edward Mountain: Okay. Thank you, that is helpful. You and many other farmers across Scotland have used genetic breeding—line breeding—to increase the productivity of your animals, which means that farmers can get them to slaughter more quickly. The sadness is that beef cattle that are ready at 11 months cannot be

sold because they are too young—they have to wait for another month before they can go into the food chain. That must be a mistake if we are trying to speed up production. Do you agree? A yes or no from Jim Walker on that would be helpful.

Jim Walker: Yes, 100 per cent. They are not veal at 11 months old. We want to get them into the food chain as soon as possible. Earlier, there was a question about eating quality. I am sitting here in Australia, where they sell carbon-neutral beef, and they have a simple consumer chart on that beef that tells you what the eating quality experience is going to be in terms of its taste and texture. What are we doing? We are using the same EUROP grading system that we had 30 or 40 years ago, because QMS and others do not want to change the current practice—probably because the Scottish abattoir sector is dominated by Irish processors who are quite happy to have bought beef from the island of Ireland, where it is subsidised to the tune of €256 million over the next five years.

The Deputy Convener: I thank all our witnesses for attending today. That concludes this evidence session. Thank you in particular to those who have travelled substantial distances to attend in person. We will suspend the meeting until 10:45 to allow witnesses to leave and for members to have a short comfort break.

10:32

Meeting suspended.

10:44

On resuming—

The Deputy Convener: I now welcome our second panel, who are from the UK Climate Change Committee. Attending remotely we have Chris Stark, who is its chief executive, and Indra Thillainathan, who is a senior analyst for agriculture and land use. I invite Chris Stark to make an opening statement.

Chris Stark (Climate Change Committee): Thank you very much. I am grateful to be speaking with you this morning from our office in London. I am actually resident in Scotland but am in our London office today.

This is the first time that my organisation has offered evidence to this committee. We are the independent body that looks at what the whole UK is doing on climate change. We offer advice to the Scottish and United Kingdom Governments, and to the Governments of Wales and Northern Ireland, on how to handle climate change and how to set targets for it. We then check progress and periodically offer that information to the Scottish Parliament and Westminster Parliament.

I am grateful to be able to talk to you today about an important issue. I am joined by my colleague Indra, who has led our modelling of agriculture and land use across the UK and in Scotland. I say all that just to kick things off.

Back in 2019, we offered the advice that led to Scotland setting its net zero target. In that advice, we made it very very clear that agriculture and how we use land are absolutely key to achievement of net zero. Since then, we have been watching and waiting with increasing impatience for policy, at UK and Scotland levels, to emerge that is fit for purpose when it comes to net zero. It is therefore good that we are able to be here today to talk about that.

I am sure that we will talk about the Scottish Government's proposals for agriculture, but it is clear that achievement of net zero is absolutely necessary. We will have to achieve it in this country and in other parts of the world, and every sector must play its role in achieving it.

We are not singling out farming when we talk about the need for farming to act and for agriculture to make changes. Agriculture is one of the most important sources of greenhouse gas emissions in Scotland. In our work to get the country to net zero, we try to balance effort across all sectors of the economy, bearing in mind the specific circumstances of Scotland when we model that.

We are clear that Scottish farming must play its role in reducing Scotland's emissions. Many of the emissions come from livestock; that is not easy to tackle without lower livestock numbers. It is therefore a hugely sensitive area and we recognise that, so we have tried—rather than it being an attack on farmers as, sadly, it is sometimes portrayed—to discuss the matter in using language about opportunities for the farming sector, which is important.

Farmers are uniquely placed. In my experience, they see climate change happening more than anyone else in the country. They have an absolutely key role because they are the stewards of the land. Three quarters of the land in Scotland is agricultural, so we absolutely need farmers to come on the journey with us. We need land to provide a wide range of services alongside food production. That includes, of course, a very strong response in storing carbon, and it includes biodiversity, nature, natural flood protection, tourism, the beauty of the landscape, and so on. Those are important issues.

In our view, farming is a profession—albeit that it is an unusual profession because of the extent to which it is shaped by policy. However, it is a profession and we have an historic opportunity to use that to our advantage. We need to talk about

diversification and modernisation of the farming profession through policy reforms that actually support farmers over the transition to net zero.

Lots of changes in practices and lifestyle will be needed to achieve net zero in farming—I think that is well understood, and we will no doubt discuss such changes today—but farmers who are willing to make the changes should get rewards from that. Policy should provide rewards; there should be livelihoods in such things. Given that, what we want is absolutely not an attack on the profession of farming.

That is why I am pleased to see the reforms. You will know that my institution has in the past had concerns about lack of progress, but that lack of progress was because we were letting farmers down by not having policies in place. The proposals will move us on a little, although I say at the outset that it is only incremental and, I am afraid, very late progress—certainly, it is too late to bring about the reductions in emissions that have been promised by the Scottish Government itself in the sector. I still worry about pace and I worry about ambition.

I have one more point to make. In the transition, we are expecting a lot of our farmers. I say that with great respect to farmers in Scotland. One could say that it is about achieving an even higher standard in Scotland, at the end of the process.

We absolutely must ensure that that is not undermined or betrayed by importation of food and meat that have been grown and reared in parts of the world that do not have the same high standards of farming and climate policies. I am sure that members of the committee will have concerns that are similar to ours about the new trade deals that have been signed, which might permit that. The places that are signing those trade deals do not offer the same protections and high standards of food production. We wrote to Department for Environment, Food and Rural Affairs ministers about that topic very recently. You can expect us to be first in the queue to defend the interests of farmers who are willing to go on the low-carbon journey, but who might see their good intentions being undermined by such moves with the new trade deals.

With that, I will end my opening statement, and we can go to questions.

The Deputy Convener: Thank you for that.

How does the change that is needed in Scottish agriculture compare in scope and scale with the changes that need to be made across other sectors in order to reach net zero by 2045?

Chris Stark: A key point is that emissions in other sectors are often driven by use of fossil fuels, and in most cases we can see ways to reduce those emissions to zero. Agriculture is different from other sectors, in that there are fewer opportunities to get to actual zero emissions.

Farming currently accounts for something like a fifth of Scotland's emissions. Other sectors have a clear path to decarbonisation, which means that by 2045, when Scotland has met its net zero target, farming will, quite comfortably, be the single biggest emitting sector, so we need to think about it in those terms.

We are not asking the sector to get to zero emissions, but we are asking, in the modelling at least, for the sector to change. That change will be driven by increased uptake of low-carbon farming practices and technologies that will in turn help to reduce non-CO_2 emissions, especially methane, from all sorts of things that currently happen on the farm. We also need to reduce waste on the farm and switch from fossil fuel to alternatives for low-carbon energy use.

When we bring that together, the great hope is that for farming, carbon will become a crop of sorts; there was some discussion of that in the previous part of the meeting. It will, in effect, be a new income stream for farmers.

Farmers have a unique contribution to make to the economy's overall transition to net zero, which goes back to what I said in my opening statement. As they are stewards of the land, we need 30 per cent of that land, in our modelling, to be converted from conventional agriculture to growing biomass, to woodland, to hedge creation, to agroforestry, to energy crops and to the big challenge of restoring degraded peatland.

In order to do that, the challenge for the farming sector in particular is that we have to free up land. In our modelling, we try to look for ways in which we can free up land while maintaining food production. Crop-yield improvements are important, because they will deliver more productive farming in Scotland. Production is a long-running problem for Scotland, so such improvements would enable us to achieve the same level of production with less land and with other inputs being smaller. That would release some land from agriculture to allow us to do the stuff that we need to do for the climate and for environmental services.

I suppose that we could say that that really means sustainable intensification of Scottish lowland farming in particular, with associated improvements in productivity, increased stocking densities and good grazing management systems in place to make that happen.

We then come to the most important and difficult issue. In our view, livestock numbers must decline if emissions are to fall. In our modelling, that will be driven especially by diet change in Scotland

and the UK. Most of the meat that is produced in Scotland is for UK consumption. We see dairy cattle, beef and sheep numbers falling on the way to 2045, which would allow the sector to be part of the journey to net zero.

Ariane Burgess: Hello, Chris. It is great to see you here. One of the things that I appreciate is that you can think about and put yourself in 2045. You have touched on the subject of my question, which is about 80 per cent of agriculture emissions being from livestock, and the need to reduce those emissions.

We heard in the previous evidence session that the beef sector is at the level that will keep the sector functioning—400,000 cows. We also heard from the hill, upland and crofting farmer-led group representative that they need to keep their headage up, but you are saying that we need to bring it down.

I think that what you are saying—I need clarification—is that we need to look at diversification. In fact, in the previous evidence session, Jackie McCreery said that no farm is a single farm—what they do is always mixed. Can you expand on that?

Chris Stark: Yes, of course. Thank you for teeing up that question. I am sure that it is a topic to which we will keep returning.

We cannot duck the fact that ruminant livestock are an important source of emissions in Scotland, the rest of the United Kingdom and around the world. Methane, in particular, is a potent greenhouse gas. Some of the work that is done by farming communities is about trying to maintain livestock numbers, for understandable reasons. However, it is difficult to see us achieving the goals that were set in the Paris agreement without there being a change in livestock numbers globally. Within the UK and Scotland, the same applies.

We need a reduction in—but not elimination of—some livestock farming production processes and numbers. However—this is important—we are not seeking to shrink the sector. In fact, if anything, we are seeking to grow it. This is about diversifying what is produced on farms and, alongside that, thinking about the essential services that we need—not just for climate change but for general improvement of the environment and of nature. Farmers should be rewarded for those things. We are looking at diversification generally of the profession of farming. Our modelling shows clearly that within that we need lower livestock numbers. That is an uncomfortable factor in our modelling, but one that we have to be truthful about.

Jenni Minto (Argyll and Bute) (SNP): I represent Argyll and Bute, in which there is a mix of farming types. A lot of it is upland farming on islands and the mainland, and there is some dairy farming. I am interested to hear about reconciliation of your proposal to reduce cattle numbers with its direct impact on the sustainability of populations. In the previous panel session, which I am sure you listened to, we heard that, for a lot of hill farmers and crofters, having beasts on the land is improving that land's ability to sequestrate carbon. I am interested to know your thoughts on that.

Chris Stark: I might bring in my colleague Indra Thillainathan to talk about that, but I will first give a brief introduction on the topic. It is absolutely the case that one can have livestock on the farm and sequester more carbon in the soil. I entirely understand that point. We are trying to look at the bigger-system question. There is an opportunity cost to taking that route.

There is a world where we can have lower livestock numbers and do something different with the farmland—in particular, growing trees and restoring peatland, as well as other things. Potentially, farmers can grow energy crops. That is where the big win is when it comes to emissions. We are trying to take a balanced approach in which, I am afraid, some of that land will need to be freed up to do those things.

We are talking about increased productivity from farming—what we sometimes call internally sustainable intensification of farming on the remaining land—so that we will continue to produce as much food as we produce today or, potentially, even more. About a third of agricultural land would be freed up to do the stuff that is really important in the transition to net zero. If we frame that correctly in policy, it is something that the farmers would be paid for. Diversification will go along with overall improvement and an increase in the productivity of farming. There will be lower livestock numbers at the end of that, but we will be cramming more services on to the same land in order to get better outcomes for the environment.

Indra, is there anything that you would like to add to that?

Jenni Minto: If I may, I will just give you another thing to think about before you answer, Indra. Many farmers in my area are from generations of farmers, so they understand their land and have been working it, they would argue, in a sustainable way. What information might you have that would support them to be able to review how they are doing things?

11:00

Indra Thillainathan (Climate Change Committee): Sorry—could you rephrase that question?

Jenni Minto: Sure. The farmers in my area and across Scotland have been farming their land for generations, so they understand the land and they know the different types of soil—they know where the peat is. They can watch their livestock move around. They understand that the outputs from the livestock, if I may put it that way, are used as fertiliser. I am interested to know how the work that you have done relates to what I am hearing from farmers.

Indra Thillainathan: We want to consider the soil-carbon benefits of grassland farming. On mineral soils, arable soils no doubt store less carbon than grassland. A lot of the grassland has been there for a very long time; there is an issue with being able to sequester more carbon, and equilibrium has probably been reached. Mineral grassland soils are unlikely to sequester more carbon because they have reached a certain age, but the fact remains that if livestock is still being grazed on that grassland, methane is still being emitted by the cattle. The carbon sequestration benefits of grassland do not necessarily offset methane emissions. If someone wanted to increase the carbon sequestration potential of a particular piece of land, they would be better off growing trees or creating more hedgerows, for example.

Jenni Minto: That has not really answered my question. It was not specifically about grassland; it was more about hill farming, which includes peatland that sequesters carbon. The argument that was made by the farming groups that we heard from earlier was that, if there is livestock on that land, it improves the peatland and allows it to absorb more.

Indra Thillainathan: I am not aware of evidence that points towards that, to be honest. There is certainly a case for saying that removing sheep from a piece of land and putting cattle there at quite low densities is better for the peat. To bring that peat back into a better condition, people are better off removing cattle or sheep altogether and restoring the land to its full hydrological condition.

The Deputy Convener: Chris Stark wants to come back in, to be followed by Jim Fairlie, Rachael Hamilton and Alasdair Allan.

Chris Stark: I will make a very simple point in response to the question. You are absolutely right, Ms Minto, to say that the farmers know their land better than anyone else. That is key in what we are trying to achieve by giving farmers the incentive to use their knowledge in new ways.

For me, one of the key tests for how the eventual bill and the proposals within it will work is whether farmers are given the freedom to use their knowledge in new ways to allow them to restore peatland in the best possible way. We would measure that and we could reward things that we can measure as a result of the proposals. I do not know whether the set of proposals that is before us will do that. It is worth saying that my expectation is that they will not.

I return to my earlier story. Farmers themselves are the core of the solution, but we have to give them the tools and the incentives to do things in the right way. That is to step away slightly from the livestock question, but we can, with the right incentives, free up farmers to do a wide range of things in different ways, and they could achieve those things more easily with a set of good proposals.

Jim Fairlie: Indra, you used the word “probably” in your response to Jenni Minto. What science have you used to work out the calculations for sequestrated carbon for grazing animals on a hill setting?

Indra Thillainathan: We very much rely on the greenhouse gas inventory, which is put together each year by the UK Government Department for Business, Energy and Industrial Strategy and is constantly being updated.

We are very much governed by what the greenhouse gas inventory for land use, land use change and forestry tells us. The inventory looks at the mitigation benefits from grassland systems. As I tried to say before, there is no doubt that grassland is a huge store of carbon, but, once it has reached that equilibrium level, there is a question as to whether it continues to sequester more carbon. The evidence that has been looked at suggests that the age of the grassland is the most important thing in relation to its ability to continue to sequester carbon. Young grassland, which is being converted from arable land, will continue to sequester carbon, but, at some point, an equilibrium level will be reached. Once that happens, the best thing that we can do is manage the land so that we do not lose that carbon from grasslands.

Jim Fairlie: Okay. Let us look at a hill setting. Am I not right in thinking that there is new science on the types of greenhouse gases that are being emitted? I also want to come back to Chris Stark about methane reduction levels, because there is now science around reducing methane through feed, but we can do that in a second or two.

Right now, the science says that the best way to renew grassland is to graze it and then to take the livestock off it. Hill farmers generally have a stocking rate that is based on the viability of their hill. I have absolutely no problem with planting trees to make a hill more viable, but, when it comes to reducing the numbers of livestock and planting trees, has any calculation been done on

how much carbon is released by breaking up the hill soil in the first place when planting trees? How do you intensify a hill farm and still make it profitable?

Indra Thillainathan: There are associated carbon losses from the initial establishment of a tree when it is planted on grassland. You can minimise those losses by, for example, careful soil preparation and using an appropriate technique to plant young saplings. There will be an associated loss of carbon emissions in the initial years, but, as that tree grows and gets bigger, those initial losses will be offset as the tree starts to sequester carbon.

Jim Fairlie: I will ask you a wee question about that. What is the lifestyle—lifestyle? The lifestyle of trees is that they stand up tall. What is the lifespan of the tree that you have planted, after you have broken up the soil and there has been an initial release of carbon? How many years does that tree have to stand in order to sequester the amount of carbon that it released by being planted in the first place?

Indra Thillainathan: That is a good question. I do not have the answer to that for an individual tree. We can certainly get that information back to you.

Jim Fairlie: Okay. I will move on.

The Deputy Convener: I have got a—

Rachael Hamilton: I have a supplementary question for Indra on exactly the same train of thought. I would like the CCC's view of the calculation on the scale of the GHG emissions resulting from commercial forestry plantation on peat soils, which, of course, are part of the upland.

Indra Thillainathan: We certainly advocate that there should be no planting of trees of any sort on organic soil—for example, on peatland, including deep and shallower peat. We have not modelled that. I believe that the UK forestry standard does not allow for the creation of woodlands on peatlands anyway. That is not something that we would advocate, and it is excluded from our analysis and recommendations.

Rachael Hamilton: Can I get some clarification? Does the upland that you are talking about, which is being grazed by sheep, have peat?

Indra Thillainathan: I am just looking at some stats. Around two thirds of agricultural land in Scotland is rough grazing. I have looked at the amount of peatland and I see that almost 40 per cent of Scottish peatland is classified as being used as rough grazing.

Rachael Hamilton: Can I get some clarification on that? Would the CCC rather that that percentage of land was grazed?

Indra Thillainathan: Do you mean the 40 per cent of Scottish peatland?

Rachael Hamilton: Yes.

Indra Thillainathan: In an ideal world, we would want some of that peatland to be restored.

Rachael Hamilton: Okay.

Alasdair Allan: I will continue with that theme. I declare an interest of a kind: like Jenni Minto, I represent an island constituency.

I am not clear what you are recommending to crofters. On the one hand, you are saying that, rather than having livestock, they might be better off having trees. On the other hand, you say—quite rightly—that you would not want trees to be planted on peatland. In places such as the west of Scotland, peatland is pretty much all that there is. What do you recommend that crofters should do instead of having livestock?

Indra Thillainathan: That is where Government policy and the agriculture bill are key. More detail is required on the level of financial support that will be forthcoming. If a sheep farmer is farming on an area that is deemed to be peatland, there is the opportunity for that farmer to reduce the number of sheep that graze on that peat and to be incentivised or provided with some financial support to restore the peatland if it is degraded.

Alasdair Allan: I am sorry, but—again, I understand the point that you have made about restoring peatland; we want to restore peatland—what is the business model for a crofter who might have a total agricultural subsidy of £2,000 or £3,000 a year, as most crofters do, to invest in something else that has not been specified in what you have said to us?

I support diversification. I realise that we cannot use the uplands only for sheep, but I do not understand what form of agriculture you are recommending for the kind of person who I have just described if it is not about trees or livestock.

Indra Thillainathan: There is still a place for livestock farming. We have not said that that should not continue. As we have said, there must be some conversion of land that is currently used for sheep farming for other uses that can sequester carbon. If the land happens to be peatland, there is the opportunity for the farmer not only to continue farming but to allocate some of the land that would have been grazed for restoration, and to be paid to do that, so that it can generate an additional income stream.

Edward Mountain: I want to follow that through. Surely it is a mixture. One side of the issue is

improving the efficiency of the animals. If there are cattle, it is a matter of reducing the calving interval and the time that it takes to get the animal into the food chain, and therefore having fewer animals around.

I cannot follow your logic if you are saying that grassland that gets to a stage of being carbon neutral should be used for something else. If grassland is properly looked after, it does not become carbon neutral; it becomes able to produce and sequester carbon from the atmosphere through the use of animals that put manure back on to the ground. I do not see the circularity of your argument. It seems to be far too segmented. Perhaps you can convince me that I am wrong.

Indra Thillainathan: As I mentioned before, we have to consider the point at which grassland stops being a continuous sequester of carbon. If it is mineral grassland and of a particular age, the likelihood is that it is no longer sequestering more carbon. However, if there are animals on that grassland, they are still emitting.

Edward Mountain: Good farmers would never stop managing the grassland properly to ensure that it does both. That is what I do not understand. You are suggesting leaving it alone. You cannot eat leaving it alone.

11:15

Indra Thillainathan: On-going management is very important in ensuring that the carbon in soils is not emitted into the atmosphere. Given the changes in climate, that is a potential risk.

The Deputy Convener: I will take a very brief supplementary from Jim Fairlie, but I am conscious that we are halfway through the evidence session and we are not yet on our second question on this topic.

Jim Fairlie: I will be very brief. Can you define what you mean by “mineral grassland”? Are you talking about grassland that is on arable land on, say, a four-year rotation?

Indra Thillainathan: If you have temporary grassland that goes in and out of rotation—that is, if you convert arable land to grassland for four to five years—you will sequester carbon over that period, but when you reverse it back to arable land, there will be some losses. When I talk about grassland’s ability to sequester more carbon, I am talking about more mature grassland—permanent grassland, as it were.

Jim Fairlie: Okay. Thank you.

The Deputy Convener: The next question is from Alasdair Allan.

Alasdair Allan: I am sorry if this question sounds as if it is on a similar theme, but I think that it diverges slightly from what has already been asked.

Again, I am supportive of what has been said about diversification and the need to tackle emissions. However, one of the ways in which we have been talking about emissions has been in terms of animal numbers, and specifically whether the dependency on, say, cattle feed should be part of the business model going forward. We have talked about livestock numbers, but is it sustainable for people to use feed other than grass as a model? After all, it is difficult to see how agriculture would exist on the west or north-west coast of Scotland if no one was allowed to bring in cattle feed. What are your views on animals being grass fed only and on other feedstuffs?

Indra Thillainathan: When you look at the west of Scotland, it makes perfect sense for animals to be grass fed. I see no reason for a massive change from the current—

Alasdair Allan: I am sorry to interrupt, but I think that you misunderstood my question—perhaps I did not put it very well. My point is that the animals cannot be just grass fed. In terms of livestock, you cannot have agriculture, as anyone would understand it, without bringing in feed to island and west coast areas. It cannot be done—there would be no livestock.

Indra Thillainathan: I am sorry—what was your initial question again?

Alasdair Allan: My question is: do you view agriculture that involves bringing in feed other than grass as sustainable?

Indra Thillainathan: I think that bringing in animal feed is sustainable. It seems quite sensible if we are talking about, say, winter. Obviously there will be silage that will have been cut during the summer, but that crop will have to be supplemented by, for example, compound feed.

Alasdair Allan: Thank you.

The Deputy Convener: I call Jim Fairlie, to be followed by Emma Harper.

Jim Fairlie: I return to the fact that the system in Scotland is predominantly grass based. Both of you have said that things can be intensified, but with hill farms, livestock numbers are pretty much set by the hill in question. Given that, I want to ask a couple of questions. First, is the introduction of methane-reducing feed part of your calculations on emissions? Secondly, how does the UK livestock production system compare with other countries that are involved in, say, beef and sheep production?

Chris Stark: Perhaps I can take that. On your first question, we factor that in; in fact, I would say that that is one of the most exciting areas. We are very excited about the use of feed additives to bring down emissions.

However, we are still in a world in which a lot of that is untested, so solely relying on that as the way forward is, for us, tricky and a risky business. It features in our models, and I hope that we will be able to do more of that in the future, but we are hungry for data that shows that it works. Indeed, that is the key aspect of our work on modelling the future over the next 35 years or so.

Jim Fairlie: Okay. I will just come in on that point. Right now, the farming community is trying to reduce its methane emissions. We know that methane gas is in the air temporarily but that it is more polluting; we understand that. That seems to be a crucial focal point in reducing the emissions that cattle will produce in intensive systems. If you factor that in—sorry, I have completely lost the point that I was going to make.

Chris Stark: If I make a point about the importance of methane—not to guess the question that you were going to ask, but my point might be related to it—perhaps that might move us on. Agricultural methane emissions are very important in the story of what is happening to our climate. I picked up the discussion in the earlier session about alternative metrics such as the GWP* metric, which is, indeed, an important way of looking at the world. The really important thing—

Jim Fairlie: Sorry, Chris—my point came back to me. I apologise.

We have already heard that we are at a tipping point for reaching critical mass. As the industry works towards reducing methane, farmers will exodus from the beef sector in numbers if they cannot make that pay. If it is simply not viable, they will not do it. However, if we take the time to allow that science to develop, we will make sure that that critical mass stays where it is. If we do not, we will be importing those products from other parts of the world. Have you worked out which one is, on balance, more favourable?

Chris Stark: Do you mean in terms of the global position overall?

Jim Fairlie: Yes.

Chris Stark: We work to the idea that we want to maintain food production in the sector, but we also want to reduce emissions. Of course we do not want that to be displaced by imports from other countries where, as I said in my introduction, standards are not as high. That brings into question the role of trade policy, what borders we have and how we manage that.

This is where we come to the key issue of diet. In our modelling, dietary change in this country will support continued food production, of a different kind, into the future. It is worth saying that, when it comes to dietary change, we are relatively conservative in our view about how diets might shift. In fact, the latest metrics are already ahead of the metrics that we have spelled out as advice in those pathways.

We have to bring in that bigger-system view of what the nation's diet is doing alongside trade policy and the need to manage livestock numbers—and, within that, to have innovative technologies such as feed additives that can help to manage methane. We try our best to do that and we continue to look at that. Indeed, it will be a major factor when we come to do the next major assessment in the next couple of years. However, it is difficult for me to imagine that we will not advise a reduction to livestock numbers as a key part of that overall strategy for net zero.

Jim Fairlie: Did you answer the question about the intensity of UK emissions as compared with other parts of the world?

Chris Stark: That is a really important point. This part of the world has one of the lowest rates of greenhouse gas emissions associated with the rearing of animals for meat production. Scotland is slightly different because it has a slightly different balance between dairy herds and beef herds, but it produces low-emission meat. Most of that is for domestic consumption, hence the link to the nation's diet.

Jim Fairlie: Thank you.

The Deputy Convener: There is a brief supplementary from Rachael Hamilton, then we will move on to Emma Harper.

Rachael Hamilton: I just want to pick up on how you answered Jim Fairlie's question, Chris. Basically, if we look at it in black and white, you are saying that we should cut livestock numbers. You say that you want to support farmers, but cutting livestock numbers is not supporting farmers. However, the CCC also says that offshoring food production is wrong. How are we meant to feed our country?

Chris Stark: To put it very simply, it is very clear in the modelling that, as the diet shifts, we in this country can produce more food from existing land while delivering all the extra services that I have talked about. The need to change that land to allow it to sequester more carbon is part of that. I suppose that I feel quite confident—

Rachael Hamilton: Sorry, Chris. On that point, I do not know whether you were able to follow the earlier session, but we took evidence from Claire Simonetta, who is an upland farmer. She said that

it looks as though extensive systems are operating inefficiently, but they are not; they are doing everything that they possibly can.

There are two different ways to calculate emissions—the GWP100 and the GWP*—and they are already doing all of that. We could reach a very different conclusion if we got the calculations correct and the Scottish Government started to speed up support and give farmers the right support. We heard examples of that happening in other countries.

Chris Stark: I fear that we are falling into the trap of imagining that the CCC is attacking farmers. I could not agree more with what you said. If we get the incentives right in policy, we can have sustainable upland farming in this country, alongside all the other services that we need. It is not my intention to give you the sense that that type of farming cannot happen in Scotland, but it is absolutely the case that policy needs to support a broader range of activities.

Emma Harper: I want to pick up on Jim Fairlie's questions and ask about emissions in other countries. In debates in the chamber, we have talked about how much water it takes to produce a litre of almond milk. It takes about 101 gallons of water to make a cup of almond milk, which is not even made in this country. In comparison, we grow grass really well in this country, and that can support our diet.

At the Health, Social Care and Sport Committee, Alice Stanton, an expert witness, talked about the misinformation that consuming red meat causes cancer, as there is now evidence that that information is not quite accurate.

How can we support food production and emissions reduction? How do we compare with other countries on those issues?

Chris Stark: The highest emissions from food production come from livestock, and our emissions from that compare very well with those of other countries. When we consider what needs to be done globally, if you look at the emissions associated with food production in this part of the world, you will see a relatively low number. That is important, but it is equally true that, even in this country, we need to see reductions in emissions from farming if we are to hit net zero, and that is doubly so the case in other parts of the world.

That brings me to the question of how that can be achieved. I go back to what I said in my opening statement about our modelling trying to present a balanced outlook. It is absolutely not the case that we are trying to ruin farming. Instead, we are saying that we should try to squeeze more on to existing land, because land is a very scarce resource in Scotland and across the rest of the UK. Part of that is about encouraging farmers to have a more diverse set of activities on their farm. Yes, there is a reduction in livestock farming in our modelling, but that is matched by a reduction in the nation's meat consumption.

That will allow us to squeeze additional services into farms, and—I repeat what I said earlier—doing so should be rewarded by policy so that we give incentives to farmers to diversify, not to reduce, their income streams and to deliver environmental services, including carbon sequestration. It is possible to do that while maintaining, if not increasing, the country's food production. That is the goal that, I hope, the proposals that we are discussing will focus on.

Alasdair Allan: It is interesting to hear the arguments develop about what agriculture might look like in the future.

I am thinking about my part of Scotland, and the answers that were given to some of my previous questions tended to suggest that there should be less agriculture and that people should be paid not to do agriculture. There might be a place for that, but I am interested in what you said about diet change. That implies that a massive cultural change is needed at the level of supermarkets. If that is the model for the future and the means by which we avoid the offshoring of carbon—a situation in which we do not produce as much food but we ask people in countries that do not care very much about carbon output to produce more for us—how on earth do we navigate through the cultural change and the change in the attitudes of supermarkets that are required to achieve the change in diet that you are talking about?

11:30

Chris Stark: That is an absolutely brilliant question. I agree that a lot of change is needed at the consumer end and the retail end. I will repeat what I said about diet. In our modelling, diet change is one of the ways in which we can continue to support food production and see livestock numbers reduce, and it can lead to a holistic outcome that allows us to do other things on the land. However, if we want that to happen, the retail offer needs to change with it.

In our models, we have advocated that, if the country is to reach net zero, there needs to be a 20 per cent shift away from all meat and dairy products by 2030, and we need to go a little further after that. Those protein sources can be substituted with a more plant-based diet. If you look at the latest indicators, you will see that the country is already ahead of that trajectory.

There is an interesting question in that regard. I suspect that most of the shift has been driven by a different offer from supermarkets. Of course, there is also a cultural aspect to it, but I want to

challenge the idea that we need a dramatic cultural shift to achieve that kind of outcome. I eat meat, but I have chosen to eat less red meat. That kind of decision is easy to make if people are offered good alternatives, especially from supermarkets. I absolutely agree that, if supermarkets are not on board with this, we should question the notion that diet change can underpin our efforts. The supermarkets might view themselves as leading the transition—I think that they are mostly responding to what their consumers are demanding—but I would like to see them lead it more.

There is the idea that we can tie the need for change to the need for healthier diets. I point out that a 20 per cent reduction in meat consumption is far less of a reduction than is indicated in health guidance. In our modelling, we are at the conservative end when it comes to those key factors.

Alasdair Allan: My only other observation, which I am keen to get your views on, is that, compared with those in most European countries, supermarkets in Scotland and the rest of the UK have far more power over the market in relation to what people eat, and they are far less likely to stock local goods. You seem to be talking about a dramatic shift, but supermarkets in the UK do not seem to be signed up to that in the way that they are in other countries. How do we tackle that attitude?

Chris Stark: I am not sure that I have the answer to that, except to say that you are right that there is a more dominant supermarket sector here and, if we were able to crack it, some of the things that we have been talking about and that we have modelled would, frankly, become a lot easier. We might have common cause in seeing that happen. I do not know whether the committee will be taking evidence from supermarkets, but questions on what they are doing about the diet shift issue, on providing local produce and on how they are supporting high-quality food production in this country that is compatible with net zero would be very good ones to put to them.

We have had some engagement with those retailers, but the modelling that we are doing is at a more fundamental level—it is about where the emissions come from and how we might support that shift in the future. We have a range of scenarios, some of which are much more demanding when it comes to these issues than the scenario that I have been discussing today. None of that change will work unless the supermarket retailers are on board.

Mercedes Villalba (North East Scotland) (Lab): We heard from the previous witnesses, and I think that we are hearing now, that livestock numbers have already reduced and are continuing to reduce. We want to avoid simply shifting emissions overseas by importing the meat that we eat here. In your view, is the nation's diet changing quickly enough to keep pace with and match the policy changes that we are bringing forward? If not, how can we improve that, and what is the Government's role in achieving this behaviour change in diet?

I will ask those questions first, but I have another one if there is time to ask it.

Chris Stark: It is interesting. In relation to the advice that we have offered, we have never gone as far as advocating some of the tougher-edged policies that would really change diet. Occasionally, you hear proposals for measures such as meat taxes. We have never made such proposals. We have proposed clearer labelling and healthy diet advice to lead people to these outcomes. In our work, we have also monitored what looks like a generational shift in some regards.

Having looked at all that together, so far, we have been proved right. The latest evidence shows that there has been a reduction in meat consumption that is ahead of some of our indicators for the transition on the diet side.

However, when we talk about diet shift as a really important component, it is really important to make the point that we cannot expect farmers in this country, who are supporting the transition to net zero, to be undermined by imports of cheap meat from other places, which would upset some of the indicators that I talked about. That is a key aspect, and that is where I have more concern.

Westminster has control of the trade deals that we have been talking about. There is a very big risk that some of those trade deals—there has been a recent discussion about Mexico, for example—will undermine domestic production. In our advice, we talk about the need for common standards for what is produced domestically and what is imported. It is frankly outrageous that cheap imports from a place such as Mexico, which has different standards relating to the carbon value of the meat that is produced, would undermine farmers in Scotland or other parts of the UK, who have been asked to meet higher standards. That is a major issue, and I do not feel at all satisfied about it, if I am honest.

Mercedes Villalba: It sounds as though you are saying that trade regulation is a more important factor—that behaviour change will follow that—than more public awareness campaigns and education in schools. You think that it is about the trade side of things.

Chris Stark: No, I think that it is about both. We see it as a combination: a shift in diets—which will result in what we call co-benefits, particularly the

health benefits of those changes in diets, such as reduced healthcare costs—plus the incentives for farmers to do low-carbon farming. We are moving in the right direction on that, but I am less confident on the trade side. I am more concerned about the fact that we might undermine all that by having a trade arrangement with countries where such protections and policies are not in place, which will undermine our domestic efforts.

The Deputy Convener: Jim Fairlie will ask a supplementary question before we move on. We are running out of time, and I am afraid that we do not have much leeway.

Jim Fairlie: Chris, I know that this has been a fairly testing evidence session for you, but one thing that we absolutely agree on is the fact that we should be eating less meat and better quality meat. Given that we are such a great producer of low-carbon meat, Scotch beef and lamb would seem to be the perfect fit for consumption in this country. However, how will we get consumer demand for meat down? If we do not reduce the demand for meat in the first place and we are working to the standards that we are, with the price implications of that, the only other way that that demand will be met is through imports.

Therefore, I take on board the points that you make about the Mexico, Australia and New Zealand deals, which will all be bad for our emissions. How much meat are we eating currently, and how much do we need to reduce it by in order to reach the target that you tell us that we need to reach?

Chris Stark: On your reflection about it being a testing evidence session, I have enjoyed it, because it has been good to have this discussion. I welcome it, and I am very happy to do more of it, if that is something that you would like. We have lots of insights from our modelling about a much wider set of issues that, sadly, we might not get to in the next five to 10 minutes.

We have landed on one of the key issues. When it comes to diet shift, we are talking about a fairly conservative—I say that again—outlook of reducing our consumption of meat and dairy products by 20 per cent over the next 10 years or so, and then we need to go a little further to something more like 30 or 31 per cent by the middle of the century. I am not a forecaster and I do not predict the future, but I know that we are on track for that kind of shift to happen, which I think is largely driven by a shift in consumer preference. Were it not to happen, we would need a combination of things to happen in the future that would allow the sector to continue on the transition to net zero, along with all the other sectors that are making the transition.

Harder-edged things are clearly part of the policy mix, but my belief is that they will not be needed. I do not think that we will ever get to the point at which a Government is willing to put in place those regulatory or tax measures, nor do I think that we will need them. I would rather that we move to consuming high-quality meat perhaps a little less frequently. We should be proud of and treasure the fact that we rear animals and produce meat really well to such high standards, but we should consume less of it. That should be part of the mix.

Alongside that, we should free up land so that farmers have diversified income streams and are supported by policy to provide a wider range of environmental services, including carbon sequestration. We should have a discussion about that being a progressive part of farming in a way that it has not been for several decades under the EU's rules for the common agricultural payment.

Jim Fairlie: If we reduce red meat intake by 20 per cent over the next 10 years, what would you replace that protein with?

Chris Stark: In the work that we have done, it is substituted with plant-based proteins—things such as legumes. The latest indication is that we are ahead of the trajectory.

Jim Fairlie: What does your organisation see as Scotland's developing post-EU agricultural and land use policy? What would a credible policy look like from a climate change perspective?

Chris Stark: It is really important to say that the Scottish Government policy proposals that we have looked at probably fall short. I have said that on several occasions, and I picked up similar discussion in the previous evidence session when I tuned in.

Policy works in this sector. In the past, we have seen what has happened when policy has changed: emissions from farming have fallen by 5 per cent since 2010, and it is mainly changes in policy that have driven that, alongside the diet shift that we talked about, which has led to a certain reduction in livestock numbers.

We need realistic farming policies that target the right climate outcomes. On that front, the Scottish Government's proposals are still too incremental, too conservative and too late. In particular, tier 1 in the proposals would maintain the status quo, and what comes after that comes much later in the process. It is difficult for me to understand how those agricultural policies would effect the kind of change in emissions—and land use—that the Scottish Government says that it wants to be achieved in the sector.

In our view, it is an important step forward, but it is one that is unlikely to deliver the Scottish

ministers' objectives for agricultural emissions or to deliver the land use shifts that we think are necessary in Scotland and across the rest of the UK to make all this possible, so that we get to net zero on time and with a fair effort across the economy. I would like the Scottish Government to respond to that and set out more detail, in particular on agricultural policies so that they more clearly support abatement in emissions.

I have not mentioned another aspect of my role, which is about considering how we adapt to climate change. It is a big challenge for those in agriculture to ensure that the land that is farmed in Scotland is ready for the warming climate, which is very important, particularly when it comes to peatland. We need the route maps that have been promised to support land use change, as well as biodiversity improvements and the environmental services that I have referred to several times. We do not have detail on that. When we see the agriculture bill and support package, I will look at whether those things are embedded in it, and we can then make an assessment of whether it is compatible with the pathways that we think are necessary—conservative as many of them are—for Scotland to reach net zero by 2045 and for us to have a healthy agriculture sector at the end of that process.

The Deputy Convener: I am conscious of time. I am sorry, but I must bring the evidence session to a close. I am also conscious that members have questions that they would like to ask. If it is agreeable, we will write to you with the questions that have not been asked today.

I thank Chris Stark and Indra Thillainathan for their time. Later in the meeting, we will reflect on the evidence and consider how to take forward the key issues.

United Kingdom Subordinate Legislation

Sea Fisheries (Amendment) Regulations 2023 [Draft]

Welfare of Animals (Transport) (Miscellaneous Amendments) Regulations 2023 [Draft]

11:45

The Deputy Convener: Our next item of business is consideration of consent notifications for two UK statutory instruments. Do members have any comments on the consent notifications?

Edward Mountain: With regard to the Sea Fisheries (Amendment) Regulations 2023, my concern relates to more bass being seen around the coast of Scotland as a result of the warming of the seas. They are caught regularly—they have been caught right up as far as Tongue. The Scottish Government and the UK Government propose that no more than two sea bass may be retained per fisherman per day during the open season, which runs from March to December. How will they police that?

The Deputy Convener: We could write to Marine Scotland to ask that question.

Edward Mountain: It seems strange to bring in a law if it cannot be enforced. Signing up to something that is unenforceable could bring discredit to the Government. I would be grateful if the committee would agree to seek guidance on that.

Ariane Burgess: The papers explain that "piked dogfish under ... 100cm" in length will be removed from the prohibited species list. However, that type of shark is still listed as vulnerable on the International Union for Conservation of Nature red list, so I have strong concerns about allowing it to be caught. I would like the committee to write to the Government or Marine Scotland to ask for an explanation of how compliance with the total allowable catch and size rules for the species will be ensured, including through remote electronic monitoring on quota vessels.

The Deputy Convener: If members agree, we will do that.

Emma Harper: I know that I am not a regular attendee of the committee—I am here as a substitute—but I would like to comment. In the notification, it says that the SI is to

"adjust the level of European seabass that may be caught within British fishing limits".

I am aware that only one licence has been issued for catching sea bass in Scotland, so, when the notification talks about adjusting, does that mean both up and down?

The Deputy Convener: We will seek clarity on that.

Are members content to agree with the Scottish Government's decision to consent to the provisions that are set out in the notifications being included in UK, rather than Scottish, subordinate legislation?

Members *indicated agreement.*

The Deputy Convener: That concludes the public session of the meeting.

11:47

Meeting continued in private until 12:01.

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