Northern Ireland Assembly

Committee for Agriculture, Environment and Rural Affairs

OFFICIAL REPORT (Hansard)

Climate Change Bill: Agri-Food and Biosciences Institute

10 June 2021

NORTHERN IRELAND ASSEMBLY

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Members present for all or part of the proceedings:
Mr Declan McAleer (Chairperson)
Ms Clare Bailey
Mrs Rosemary Barton
Mr John Blair
Mr Maurice Bradley
Mr Harry Harvey
Mr William Irwin
Mr Patsy McGlone

Witnesses:

Mrs Josephine Kelly	Agri-Food and Biosciences Institute
Dr Elizabeth Magowan	Agri-Food and Biosciences Institute
Mr Pieter-Jan Schön	Agri-Food and Biosciences Institute

The Chairperson (Mr McAleer): I welcome, via StarLeaf, Josephine Kelly, the acting chief executive; Dr Elizabeth Magowan, the director of the sustainable agri-food science division; and Pieter-Jan Schön, the director of the environment and marine sciences division. I invite you to commence your briefing to the Committee.

Mrs Josephine Kelly (Agri-Food and Biosciences Institute): Chair, thank you very much for the invitation to the Committee. The Agri-Food and Biosciences Institute (AFBI) is delighted to be here, because sustainability, climate impact and environmental changes are very much part of our science. We are an arm's-length body of DAERA and are the largest provider of scientific services. We have a wide range of scientific research across AFBI. I will keep the introduction brief, because I know that you are tight for time.

I am Josephine Kelly, acting chief executive, and with me today is Dr Elizabeth Magowan. Elizabeth is one of our science directors in AFBI, and she is in charge of the sustainable agri-foods sciences division. Pieter-Jan Schön is director of the environment and marine sciences division. We recently formed the new environment and marine science division in response to the growing demand for our services in relation to the environment. That is a very brief introduction. You have the paper in front of you. Elizabeth will run through the sections that are most relevant to her area of expertise, and then Pieter-Jan will run through his areas. I want to leave plenty of opportunities for questions from the Committee. I will hand over to Dr Magowan.

Dr Elizabeth Magowan (Agri-Food and Biosciences Institute): Thank you, Josephine. I am delighted to be here. In the interest of brevity, I will call out some of the key points aligned with the greenhouse gas story. We are scientists, so, as we reviewed the document, we commented on it in a scientific capacity.

We recognise that the Climate Change Bill targets net greenhouse gases as well as soil and water quality and biodiversity and that it will set budgets aligned with those. First, perhaps some improvement could be made on understanding how the Climate Change Bill might talk across other legislation in UK law; for example, the water framework directive and the habitats directive. With regard to the Bill, from listening to some of the commentary this morning, the big question is this|: how do we get there? From a science perspective, Northern Ireland's economic model is very dependent on, and generally well suited to, a grass-based system and the livestock farming that suits a grass-based system.

Achieving net zero over the next 25 to 30 years will be extremely challenging from both an east-west and North/South perspective, based on the literature and the documents that we reviewed and, indeed, the consortia that we have been involved in. Using all existing tools and current circumstances to meet net zero by 2045 will very likely involve a reduction in livestock numbers. Increases in productivity may offset some of that, but even the Climate Change Committee's (CCC) 82% target, which is backed up by Scotland's Rural College (SRUC) analysis, calls for the need to reduce livestock numbers, albeit offset by productivity, the extent of which we would need to measure. With regard to the CCC, we recognise it as a competent authority to provide high-level, strategic advice for the UK, and it engages very widely.

It is also important to recognise that greenhouse gases — methane, nitrous oxide and carbon dioxide — are global, not local, gases. Ammonia, which is also an air-quality issue for Northern Ireland, is a local gas and, therefore, has to be dealt with locally, but greenhouse gases per se are global gases. As such, the global net zero goal is very important, and whilst Northern Ireland absolutely needs to make a significant contribution to it, that achieving the global and national goal of net zero is as important as achieving the local goal.

We also call out the importance of a just transition for Northern Ireland, based on our current economic model. I was involved heavily in a UK-wide consortium, through the Centre of Innovation Excellence in Livestock, which brought together the baseline, state-of-the-art knowledge of how the UK livestock industry could work towards net zero. The overriding consensus from that meeting, which was a scientific consortium of 12 of us from across the UK, was that it will be very challenging, due to the physical and biological nature of livestock, particularly ruminants.

Whilst there are tools and solutions at the minute that will take us some of the road, as well as the sequestration that we can realise from our land through forestry, agroforestry, hedgerows etc, it will be very challenging. Therefore, collaboration in sectors, between sectors and between countries — east-west, North/South and internationally — will be extremely important.

Those are a couple of the key points that we wanted to highlight from the greenhouse gas paper. I am happy to come back on any questions. I will hand over to Pieter-Jan, who will comment on soil quality, water quality and biodiversity.

Mr Pieter-Jan Schön (Agri-Food and Biosciences Institute): Thank you, Elizabeth. I will briefly focus on the other targets areas in the Bill on water quality, soil quality and biodiversity. As you heard from the Woodland Trust, a healthy environment is central to any adaptation policy and will help mitigate the effects of climate change. In fact, those targets on soil and water quality and biodiversity are important considerations for the climate change agenda. A healthy ecosystem provides resilience to climate change effects, such as extreme weather events and helps us to cope with our existing position and improve things. In that context, having a realistic approach is very important. Those are all integrated and interlinked and are often associated with conflicting policies, but the solutions to them have to be seen in that integrated context.

Soil is a very important natural resource in Northern Ireland, considering our dependency on agriculture. Good soil helps us to continue having a productive agriculture sector and to maximise the opportunities for carbon sequestration and above-ground vegetation. Managing our soil is therefore very important, given that it has a key role in managing carbon and nutrients, particularly phosphorus and nitrates, from farming and other land uses. Our previous studies of catchments have shown that wider soil sampling would be transformational in facilitating the management of our soils.

Water quality is one of our main environmental challenges in Northern Ireland. Again, the interlinkage with soil use is important for a holistic and integrated approach. We need to look at those things in an integrated manner to improve our waterways, including measures such as manure management and a circular economy. There is no single solution to the water quality challenges that we face in Northern Ireland. Therefore, a catchment-based approach is very important.

Biodiversity is a consequence of good environmental health and is used as an indicator to protect our environments and, again, help us to cope with climate change mitigations and adaptations. You heard this morning from Lord Deben, who touched on peatlands in particular. It is about managing our peatlands and protecting those habitats. That is so important for contributing to the *[Inaudible owing to poor sound quality.]*

The Chairperson (Mr McAleer): Thank you for that briefing. A number of members want to come in, but I want to say a couple of things before moving to them. Your briefing referred to the importance of collaboration and the transboundary nature of the issues that we face on this island. Bearing that in mind, is it sensible for this island to have two separate goals, standards and approaches when setting targets for climate change?

Dr Magowan: As I said in the paper, greenhouse gases are a global issue. We are in the UK, so we cannot comment politically on what that is or is not. However, from a scientific perspective, the bottom line is that greenhouse gases are a global issue and there needs to be east-west and North/South collaboration on how we reduce emissions and work together, east-west, North/South and internationally, to address overall global emissions more so, even, than local Northern Ireland emissions.

The Chairperson (Mr McAleer): We are looking at implementing the targets in the Bill. Bearing it in mind that food is processed across the island of Ireland, do we, effectively, have lower environmental standards in the North? Would it have any impact on trade with the EU or the rest of the world that one part of the island had different environmental standards or that food coming from here would be deemed not to have been produced using environmentally sustainable practices? Would that have any impact on our international reputation and on our ability to access international markets?

Dr Magowan: That is not something that we have looked into to any great extent. We are very focused on solutions to reduce emissions as opposed to measuring the impact on trade. I am aware of work, potentially, starting to look at that, perhaps, working with DAERA, but it is not something that we have any real evidence for at this time.

The Chairperson (Mr McAleer): You will appreciate more than I do that solutions change with emerging evidence and science. Wales and Scotland have adjusted their targets. Do you agree that the current known solutions will not be applicable in a few years' time and that, in that regard, we should set more ambitious targets?

Dr Magowan: Science will always bring through new innovations and solutions. The more that is invested in it, the greater the possibility and efficacy and potential for success of those solutions. I would need a crystal ball to answer that question completely, but, from a science perspective, I am assured and am confident that there will be new solutions. In our paper, we say that it is important, therefore, to have a mechanism that would keep targets, abilities and the climate change action plan under review to make sure that the state-of-the-art knowledge is recognised in the action plan, the inventories and the targets. I have confidence that solutions will be coming forward. It is important to have a mechanism to make sure that those are recognised and that flexibility is built in to achieve the best that we can in the time frame.

Mrs Barton: Thank you for your presentation and your comments. Does agriculture get any recognition for carbon sequestration? If you have grass growing on your farmland and you have hedgerows as well, what recognition does agriculture get? We are talking about agriculture reaching 82% by 2050, but will there be any recognition if it gets to that?

Dr Magowan: Yes, Rosemary. The improved grassland and grassland and crops are all recognised in the Land Use, Land-Use Change and Forestry (LULUCF) inventory. There is a recognition, and our science is about trying to make sure that information is fed into the inventories on how much carbon is being sequestered in our grasslands. We are doing work on how much is sequestered in our hedgerows and making sure that the figures are fed into the inventory and recognised. Forestry is

recognised, as are grasslands and crops. Other areas need to be recognised, but that work is under way.

Mrs Barton: OK. Thank you. What new technologies are you looking at to improve greenhouse-gas emissions and measure them better?

Dr Magowan: Sorry, Rosemary. Are you asking about technologies to measure them better or to provide solutions?

Mrs Barton: New technologies under way that you are looking at.

Dr Magowan: Sure. Methane is one of the main greenhouse gas contributors. To reduce methane emissions, you need, to get a bit technical, to alter the rumen in the animal. Diet is a key function of that. Dietary additives such as 3-nitrooxypropanol (3-NOP), seaweeds etc. are coming through. We are working with companies and in projects Europe-wide, North/South and east-west, looking at the efficacy of those feed additives. That is one solution. Other solutions include reducing waste on the farm and earlier detection of ill health, with earlier intervention to reduce it.

Then you come to slurry. There are additives to reduce methane emissions from slurry, along with covering tanks and anaerobic digestion to drive circular nutrient use as well as harness the energy from slurry to feed the electricity grid. We are looking at a pipeline of solutions to reduce emissions and sequester carbon.

Mrs Barton: We hear about new electric cars. What progress has been made on agricultural machinery such as silage-making and heavy machinery? An electric battery is not *[Inaudible owing to poor sound quality.]*

Dr Magowan: I need to look into it a little more, Rosemary, but I understand that the size and power of the batteries are a huge challenge. A lot of robotisation work is being done in the University of Lincoln that we are keeping an eye on. Those developments are all coming forward.

Mrs Barton: Thank you.

Mr Irwin: Thank you for your presentation. My question is about reaching net zero by 2045 and the dangers that it will pose to the agriculture sector, including a possible reduction in livestock. At the end of the day, what overall difference will it make if we achieve 82% by 2050? The overall difference made to UK emission reductions will, I would have thought, be minimal, even if Northern Ireland reaches net zero by 2045. We will have damaged our industry but achieved very little. Is that analysis right?

Dr Magowan: We have not done the exact number crunching for figures behind what the difference would be. I would have to look to the CCC for those figures, which I do not have to hand. I understand that it probably would not make that much difference in the grand scheme of things. I come back to the argument that global net zero is as important as local net zero. In the global scheme of things, it definitely would not make a big difference.

Mr Irwin: It would be such a minute difference that it would not be known. Our contribution is 0·04%, so it is a very small difference, but if we can reduce by 82% 2050 that would actually *[Inaudible owing to poor sound quality.]* In reality, it means that the UK *[Inaudible owing to poor sound quality]* seemed a sensible *[Inaudible owing to poor sound quality.]* OK. Thank you.

Mr McGlone: I have read the diplomatically worded analysis of AFBI on the time frame for the targets. Do you agree with the analysis of Lord Deben earlier that it will be extremely difficult, if not impossible, for us to meet the targets of net zero by 2050? As he saw it, meeting 82% was going to be very difficult. I want to get this from your purely scientific point of view, because it is vital for a lot of *[Inaudible owing to poor sound quality.]*

Dr Magowan: Maybe Pieter-Jan will have a comment on this as well, but I will go first. As I said, I chaired a consortium of academics across the UK last year that assessed the baseline of where we were with regard to livestock and net zero. The consensus across that scientific base was that it was going to be extremely challenging to reach net zero by 2050. Indeed, when I was preparing for this, I looked into the SRUC analysis, which fed into Lord Deben's and the CCC's 82% target. That also

presented a very challenging set of circumstances, and, even from looking at the Teagasc marginal abatement cost curves (MACC), we see that that calls out the very challenging circumstances and the huge investment that would be needed to achieve net zero in agriculture by 2050. Yes, I concur, and I have a lot of respect for CCC as a competent body on the strategic direction for the UK. I concur that it will be extremely challenging for agriculture to meet the emission reductions because of the biological nature of what we are working with.

Mr McGlone: Thanks very much for taking us into that territory, so please bear with me, Chair. How might those challenges manifest themselves?

Dr Magowan: I do not mean to get into the weeds of science, but we have ruminant animals. This is all on the assumption that Northern Ireland wants to retain its economic model, which is based on a ruminant industry on grassland production. That is the assumption. On the basis of that assumption, the ruminant animal has a rumen that inherently produces methane. It is not a ruminant animal if it does not. Whilst we can reduce emissions significantly and capture carbon, based on the assumption that we want to retain the economic model, the volume of the stock that we have in Northern Ireland is such that there are huge reductions to be made and a huge amount of carbon to be sequestered. Therefore, it makes it very difficult to achieve in the longer run. It will still take significant investment from government, industry and academia to achieve the new solutions needed to get to net zero.

Mr McGlone: What is the scientific opinion on whether achieving 82% and achieving net zero within the specific time frames is possible? Lord Deben said that it would be extremely challenging to get to 82%, but what is the science on that and on the other route? If the target of 82% is seen as extremely difficult and extremely challenging, how is the other seen?

Dr Magowan: We do not have that analysis to hand at this time, but we know from the current modelling that it will be very challenging. We have established that there is a big gap in the unknown technologies that are needed to address the huge gaps that we can see in front of us. What is achievable at this time is a question mark, but the ambition should be there.

Mr McGlone: The modelling is for the 82% target. Are you likely to have any for net zero, that is 100%?

Dr Magowan: Sorry, say that again, Patsy.

Mr McGlone: If I picked you up right, you have modelling based on the 82% target. Are you likely to have modelling or is anybody working modelling on what the difficulties might be for the 100% target within the time frame?

Dr Magowan: The modelling that I am referring to is SRUC's work that fed into CCC. SRUC has done a MACC for Scotland, and Teagasc has done its MACC for the South. That is work that we now need to do to inform the climate action plan.

Mr McGlone: That is grand. Thanks very much indeed.

The Chairperson (Mr McAleer): Thank you. Before we conclude, I have a question. I read the narratives of North and South on that very issue. We are on the same island and have the same farming patterns, the same set-up, the same boundaries; everything is virtually the same. However, the narrative from the South, from Teagasc, and, indeed, from the marginal abatement cost curve is that, if we do not implement the on-farm actions on the marginal abatement cost curve, livestock cuts may have to happen; whereas, in the North, I read that livestock cuts are almost the solution. It is the first thing thrown up, which causes a great deal of anxiety amongst the farming community.

I also read from experts in the South of Ireland. I quoted one recently, Professor Alice Stanton, who says that there are already many farms, particularly in marginal areas, that are already carbon-neutral. How can you explain that difference on one island? When will farmers know whether their farming operations are carbon-neutral?

Dr Magowan: I am sorry, Chair, but we lost your last sentence or two.

The Chairperson (Mr McAleer): I have read other experts and academics who say that many farms, particularly in marginal areas, are already carbon-neutral. When will the Department provide farmers

with a calculator, like a modified version of the BovIS calculator to let them know whether their farm businesses are carbon-neutral? If farmers do not know that, how can they seriously plan ahead towards becoming carbon-neutral?

Dr Magowan: There may be farms that are carbon-neutral. That is maybe talking back to the stocking densities that they have on the land or the amount of forestry that they have. It is not impossible for some farms in Northern Ireland and Southern Ireland to be carbon-neutral, depending on their circumstances. However, we are talking about the national goal.

As regards the calculator, there is a beef carbon calculator associated with the BovIS tool at the minute. That is available, and some of the work we do with the Livestock and Meat Commission (LMC), the Northern Ireland Meat Exporters Association (NIMEA), and others, uses that for carbon calculations, and with the College of Agriculture, Food and Rural Enterprise (CAFRE). That is being rolled out at the minute. There are other carbon calculators, again from SRUC, the agrecalc tool, the Cool Farm calculator. One of the jobs that we hope to do in the future will be to harmonise those calculators. They can always be improved. Hopefully, that answers your carbon calculation question.

The Chairperson (Mr McAleer): It is important to hear from the Department that there may be farms that are already carbon-neutral. The headlines from the climate change debate have left most farmers very worried, because they believe that they have to cut at least 50% of their livestock. However, if we hear from the Department that farms may be carbon-neutral, that would not be the case.

Dr Magowan: As I say, I do not know the specific circumstances. Some of those farms may have very low stocking densities. You could have bespoke situations, and that is fair enough. However, what we are talking about is the national argument.

The Chairperson (Mr McAleer): Therefore, livestock cuts are not the immediate solution; there may be other solutions. There may be farms — there clearly are — that are carbon-neutral.

Dr Magowan: It depends on the target that we want to meet. Livestock numbers are an obvious mitigation here and now. There are other solutions in the pipeline. However, there will not be one golden bullet that will get us to the solution. It will take a combination, and what we have to adopt all depends on the target and when we need to get there.

The Chairperson (Mr McAleer): That is perfect. Thank you very much. That was very helpful, Elizabeth, Pieter-Jan and Josephine. We will see you all again as this debate and other matters unfold.

Dr Magowan: Thank you.