



**Cynulliad Cenedlaethol Cymru
The National Assembly for Wales**

**Y Pwyllgor Cynaliadwyedd
The Sustainability Committee**

**Dydd Iau, 22 Ionawr 2009
Thursday, 22 January 2009**

Cynnwys
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Cofnodir y trafodion hyn yn yr iaith y llefarwyd hwy ynndi yn y pwyllgor. Yn ogystal, cynhwysir cyfieithiad Saesneg o gyfraniadau yn y Gymraeg. Mae hon yn fersiwn ddrafft o'r cofnod. Cyhoeddir fersiwn derfynol ymhen pum diwrnod gwaith.

These proceedings are reported in the language in which they were spoken in the committee. In addition, an English translation of Welsh speeches is included. This is a draft version of the record. The final version will be published within five working days.

Aelodau'r pwyllgor yn bresennol
Committee members in attendance

Mick Bates	Democratiaid Rhyddfrydol Cymru (Cadeirydd y Pwyllgor) Welsh Liberal Democrats (Committee Chair)
Alun Davies	Llafur Labour
Lesley Griffiths	Llafur Labour
Darren Millar	Ceidwadwyr Cymreig Welsh Conservatives
Brynle Williams	Ceidwadwyr Cymreig Welsh Conservatives
Leanne Wood	Plaid Cymru The Party of Wales

Eraill yn bresennol
Others in attendance

Dai Davies	Undeb Cenedlaethol yr Amaethwyr National Union of Farmers
Derek Holliday	Cymdeithas Tir a Busnes Cefn Gwlad Country Land and Business Association
Simon Neale	Asiantaeth yr Amgylchedd Environment Agency
Rhian Nowell Phillips	Undeb Amaethwyr Cymru Farmers Union of Wales
Julian Salmon	Cymdeithas Tir a Busnes Cefn Gwlad Country Land and Business Association
Huw Thomas	Undeb Cenedlaethol yr Amaethwyr National Union of Farmers
Dr Roger Wade	Asiantaeth yr Amgylchedd Environment Agency

Swyddogion Gwasanaeth Seneddol y Cynulliad yn bresennol
Assembly Parliamentary Service officials in attendance

Dr Virginia Hawkins	Clerc Clerk
Meriel Singleton	Dirprwy Glerc Deputy Clerk

Dechreuodd y cyfarfod am 1.09 p.m.
The meeting began at 1.09 p.m.

Cyflwyniad, Ymddiheuriadau a Dirprwyon
Introduction, Apologies and Substitutions

[1] **Mick Bates:** I welcome Members to this afternoon's meeting, as well as all our guests this afternoon. In a moment, as I am sure you are aware, I will ask you to introduce yourselves for the Record before making very brief statements about your written evidence.

[2] I need to make the usual housekeeping announcements first. In the event of the fire alarm sounding, you should leave the room by the marked fire exits and follow the instructions of the staff. There is no test scheduled for this afternoon. Please make sure that all

mobile phones, pagers and so on are switched off as they interfere with the broadcasting equipment. The National Assembly for Wales operates through the media of both the Welsh and English languages. Headphones are provided, through which the simultaneous translation can be received. For those who are hard of hearing, the headphones can also be used to amplify the sound. The interpretation is available on channel 1, and the verbatim feed is on channel 0. Please do not touch the microphones as you might turn them off.

1.10 p.m.

Ymchwiliad i Leihau Carbon yng Nghymru: Sesiwn Graffu ar Ddefnydd Tir Inquiry into Carbon Reduction in Wales: Scrutiny Session on Land Use

[3] **Mick Bates:** For this item, we have with us representatives from three organisations: the National Farmers' Union Cymru; the Farmers Union of Wales; and the Country Land and Business Association. For the second part of the session, we will have representatives from the Environment Agency with us.

[4] Would the representatives please introduce themselves for the Record? We will start with Huw and move along the line, after which, the NFU can make a statement lasting a couple of minutes about its headline issues, before Members ask questions on your submission.

[5] **Mr Thomas:** I am Huw Thomas. I work for NFU Cymru as an Assembly adviser.

[6] **Mr Davies:** I am Dai Davies, and I am president of NFU Cymru.

[7] **Ms Nowell Phillips:** I am Rhian Nowell Phillips, and I am a senior policy officer with the Farmers Union of Wales.

[8] **Mr Salmon:** I am Julian Salmon, director of CLA Wales.

[9] **Mr Holliday:** I am Derek Holliday, head of environment at CLA Wales.

[10] **Mick Bates:** For our evidence, we will start with the NFU, please.

[11] **Mr Davies:** Thank you, Chair, for allowing us to come here to present oral evidence on this important matter. As an organisation, NFU Cymru represents 15,000 members, and we are pleased to be here to give our evidence to the National Assembly's Sustainability Committee as part of your inquiry into carbon reduction.

[12] Agriculture is an important industry in Wales that provides direct employment to 57,000 people as well as supporting numerous other jobs in auxiliary industries. It produces a range of top-quality products. NFU Cymru recognises Welsh farmers' contribution to carbon emissions and the steps that can be taken to reduce the industry's carbon footprint. Figures from the 2005 greenhouse gas inventory show that Wales's carbon emissions attributable to land use amount to approximately 1.2 per cent, a figure that is almost entirely associated with the cultivation of soil and the consumption of fossil fuels. Wales's soils also represent a major carbon sink, and recent studies estimate that they contain as much as 410 million tonnes of sequestered carbon.

[13] The total emissions from agriculture and the land use sector are offset to some extent by carbon removal from forestry planting and management, which results in the removal of carbon from the atmosphere. The use of such technologies as anaerobic digestion and farm-scale renewables also offer a means of offsetting agriculture's carbon footprint. Fossil fuels are likely to play a role in agriculture for the foreseeable future. Ensuring efficient agricultural

practice should play a major role in helping to keep carbon emissions to a minimum. Chair, I will leave it at that.

[14] **Ms Nowell Phillips:** I am the senior policy officer with the Farmers Union of Wales. I welcome this opportunity to contribute to the committee's inquiry into carbon reduction through land use. Dai highlighted the main issues—it is always better to go second—so I will not repeat everything. I would, however, highlight the need for a communications strategy for farmers on climate change as a whole. There is a lot of confusion as to what is happening. We know that climate change is happening, but sometimes, those of us on the ground get left behind with regard to what that means to us as individuals and what contribution we can make to mitigate the effects of climate change. One thing that I hope comes out of this is that existing structures, such as Farming Connect, get used to improve the flow of information on what farmers can do to implement energy efficiency measures and to encourage more use of anaerobic digestion and renewable energy on the farm. That enterprise would not only be energy efficient to help to meet the Assembly's targets but also economically efficient for farms.

[15] **Mr Salmon:** Good afternoon, and thank you for allowing us the opportunity to give evidence. As you will have read from our submission, the Countryside Land and Business Association has been engaged with its membership on issues of climate change for quite a long time, starting in 2001, with a lengthy document containing 102 recommendations. Sadly, eight years later, few of them have been implemented.

[16] Unlike many other sectors, we recognise that land management can make a positive contribution to mitigating the effects of climate change and towards carbon sequestration. So, we support any attempts to do that and also to limit greenhouse gas emissions. That is why, more recently in 2007, along with the National Farmers Union and the Agricultural Industries Confederation, we produced another useful policy document called 'Part of the Solution', which offers solutions to the effects of climate change. It is also why we as an association have invested in CALM, which you may have read about, and which stands for carbon audit land management. It is a computer programme management tool for land managers to evaluate the profit and loss account of their carbon activities and their enterprise mixes.

[17] However, we are cautious about the idea of imposing target reductions on things such as carbon. If, by doing so, we merely export production to other parts of the world where such constraints are not imposed, it seems to be rather a self-defeating exercise that is of no benefit to the climate. However, there is currently technology and several commonsense management techniques being used that can now be adopted. Central Government and the Assembly Government must identify and decide which of these systems works the best, and how they should be incentivised and suited to our circumstances. For example, as we have mentioned, there are systems such as anaerobic digestion, hydro, biogas and forestry, and there are tools that could be used, which do not necessarily involve Government money, such as making changes to the planning system, offering tax incentives—which is outside the Assembly's competence, but it could lobby central Government for that—and also steps such as making more use of timber in a building. So, it is not impossible.

[18] There are many things that we can do and we have held nearly 12 months of consultation, which some colleagues and I have been involved in. We have spent a lot of time and effort on it, but it does not seem to have resulted in many serious implementation actions. In fact, we also have another high-level policy statement consultation, which reiterates many of the questions that have already been asked. With the greatest respect, we suggest that we require actions to implement, and we are ready to do so.

[19] **Mick Bates:** Thank you very much. What a fine note to end on, about actions. I am a bit concerned about the glossy mountain that you are building over there, Julian.

[20] **Mr Salmon:** So are we. *[Laughter.]*

[21] **Mick Bates:** It is an aim of our inquiry to find ways to act, and so I was taken by your remarks. Alun, do you wish to say anything?

[22] **Alun Davies:** I was interested in what you said, Mr Salmon, about the documentation and the work that you have done on this, which I think we all recognise. You said that few of the 102 recommendations that you published in the original document in 2001 had been implemented. Why have so few of those recommendations been implemented? Is it due to the Government, the industry or society?

[23] **Mr Salmon:** At an individual level, we have members who have just got on and done it. They have been entrepreneurial, they are doing things now, and they have seen opportunities for that. However, at a more general level, the public—and in that I include quite a lot of our members—need an incentive, encouragement and a planning system that says, ‘Yes, you can’ rather than, ‘No, you cannot’. We need guidance from Government agencies when it comes to issues of renewable energy that says, ‘Yes, you can, but like this’ rather than, ‘No, you cannot’. It needs a more positive approach, because you have only to look across to the near continent to see that many people have been doing it for quite a long time to good effect, and I think that you know that we could take some immediate lessons from them.

[24] **Mick Bates:** Following on from that, I notice that the FUW’s submissions lead us towards a communications strategy. So, it is about changing behaviour greatly, and I wish to hear from each of you whether you think that there is a way of changing behaviour that will work. Can it be done through a voluntary scheme such as CALM, which you mentioned, or do we need to incentivise the system so that farmers are paid for doing certain things that will reduce carbon?

1.20 p.m.

[25] **Mr Davies:** I do not accept that there has not been a change in behaviour; there has been a dramatic change in behaviour. If you look at the level of fertiliser that was used between 2000 and 2002, you see that it was relatively high compared with what it is today. Fertiliser is probably one of the main contributors to our carbon footprint, and people are using it very sparingly these days. There could be numerous reasons for that. One could be that people are concerned about its effects on the environment, or there could be a cost issue. So, I do not accept that nothing has been done.

[26] **Mick Bates:** However, is the biggest driver a conscious change of behaviour, or is it a simple reaction to the price of fertiliser more or less trebling overnight?

[27] **Mr Davies:** In comparison with its price today, fertiliser was reasonably cheap in 2001. The most dramatic changes have happened in the past 18 months, so there must have been other drivers. I am sure that, from where you are seated, you would like to say that Farming Connect has educated farmers to use fertiliser more efficiently. Someone has triggered that change, as we have seen a marked reduction in the use of fertiliser.

[28] **Mick Bates:** However, which is the most important factor in changing behaviour? Is it price control or incentivising the system?

[29] **Mr Davies:** Common sense tells us that there are many issues. Price is one factor, but education and the transfer of technology and information is also important, which is where Farming Connect has played a role in the past eight to 10 years, or however long it has been

in existence.

[30] **Mick Bates:** I wrote it in 1999.

[31] **Ms Nowell Phillips:** There will have to be a mixture of measures. As Dai has said, there have been cultural changes, which may be driven by economics, and efficiency measures on farms can save money. So, there will be a need for the incentivisation of large capital projects, such as anaerobic digestion and others, and perhaps biogas, somewhere down the line. However, there are huge opportunities, particularly for the more intensive dairy units, for example, to start reusing the heat and power possibilities on farms. The problem with any embryonic technology is that people are unwilling to put in the resources because they do not know enough about it. That is where the Government can take a lead in research and development, but also in pump priming for that sort of enterprise in future. However, I think that an holistic approach is needed.

[32] **Mick Bates:** So, you are saying that raising awareness about the carbon consequences of agriculture must be part of a bigger communication strategy. Is that what you are really saying?

[33] **Ms Nowell Phillips:** Absolutely. Your inquiry today is about carbon reduction, and, granted, there is a lot of documentation out there on climate change and the possibility of mitigating its effects, but, to your Average Joe farmer, this is still a pretty high-level issue. No-one is coming out with real examples, saying, 'If you do this, it will be helpful, because this will happen'. It is still being talked about by the scientific fraternity as though it is in the ether, and it is up to us all to try to make it personal.

[34] **Mick Bates:** That is not true of the Countryside Land and Business Association. Let us hear from you. You have already started 2009 by publishing a document. What is your view of how best to achieve an awareness of carbon consequences?

[35] **Mr Holliday:** In fairness, it is a journey, because effecting behavioural change by increasing people's knowledge base is quite difficult. Over the past few years, it has been an awareness-raising exercise, and the stakes rose recently with the Committee on Climate Change's announcement before Christmas. Effecting behavioural change will take a range of different policy levers. There are many things that can be done right now, as Julian has already said, but the key is that it needs a step-by-step approach and a comprehensive communication plan. Other devolved Governments have tried to get climate change messages to the people on the ground who deliver and implement those changes. In this case, they are farmers and land managers. So, it requires a whole range of policy levers.

[36] **Mick Bates:** In our first evidence-taking session, the RSPB and the national parks were keen for land managers to change their views and become more aware. I want to bring Brynle in now.

[37] **Brynle Williams:** Good afternoon, gentlemen. It is interesting to note that, of the 92 proposals, we have implemented very few of them.

[38] **Mick Bates:** There were 102 proposals.

[39] **Brynle Williams:** Sorry, 102 proposals.

[40] **Mick Bates:** They are as good as the Government at making recommendations. *[Laughter.]*

[41] **Brynle Williams:** We are trying to find out why these have not been implemented.

Would you agree that this entrepreneurial movement towards carbon reduction is due to poor profitability in agriculture over the past 10 to 15 years? We are now seeing some farms beginning to improve. The profitability is there, and the confidence of reinvestment is just returning. Is this why we have been lagging behind? Has it been solely down to finance, or is it a matter of will or what?

[42] **Mr Salmon:** In all honesty, I do not think that there has been much incentive to change. The recent incentives have been driven by price. We have de-stocked animals for a variety of reasons. We do not throw fertiliser around when it costs £450 per tonne. You do not plough or use tractors unnecessarily when red diesel costs 80p per litre. Those business decisions are easy to make. As it happens, as the price of oil reduces again, I suspect, from a business point view, that our intensity or intent will probably diminish with it, but I do not know. Ultimately, it is a business decision, which is why you need an incentive as well as an altruistic motive.

[43] **Mick Bates:** Thank you. That was good, honest evidence.

[44] **Mr Salmon:** Although I do not wish to blow my own trumpet, our organisation tends to specialise in thinking ahead. That is why we started this discussion with our members rather a long time ago, and we are frustrated by the fact that the rest of the world is taking longer to wake up to it.

[45] **Mick Bates:** Brynle, could I take you into the data and monitoring issues that we also need to know about?

[46] **Brynle Williams:** Yes. How can carbon footprinting methodology for agricultural holdings in Wales be developed?

[47] **Mr Davies:** Before I go on to that, I will come back to the 92 directives or suggestions. Thank God, I do not live under a pile of papers; common sense prevails. I would not accept that things have not moved forward. Things have moved forward dramatically. If you look at the dairy sector, you will see that efficiency factors are being built in, such as heat exchanges. Ten years ago, you would have used a lot of electricity to cool the milk, but that is no longer the case. Things are developing daily. When writing papers and so forth, you need to communicate this in a language that grass-roots farmers understand if they are to move forward with it. I come back to such issues as the renewables obligation certificates, which have been thrown at us from on high, as it were. I have been through ROCs umpteen times with people but I still do not understand them. I went on a bit of a jaunt with the Farming Connect money to Austria last spring.

[48] **Mick Bates:** I am sure that it was not a jaunt. *[Laughter.]*

[49] **Mr Davies:** The situation there was totally different. It was put to farmers in a clear and understandable way. A farmer generated electricity from anaerobic digesters, and he had 19p per unit for it. The commercial rate per unit was approximately 12.5p at that time. However, it was clearly understood. No grants were involved. The farmer invested his £1.2 million in his anaerobic digester, and he knew that he would be paid 19p per unit for the next 13 years, by which time he would have covered his costs.

[50] **Mick Bates:** There are many interesting questions today. I should add that, in the latest energy Bill, there is a realisation that feed-in tariffs—and you referred to how they are paid—are an important process if we are to give at least a realistic development rate to other forms of energy. Do you want to speak, Alun?

[51] **Alun Davies:** I was quite taken by some of Mr Davies's evidence. Would it be

possible for you to provide us with some supplementary written evidence on the changes that you have seen in agricultural practice over the past 10 years? You have given us some examples this afternoon, which will be in the transcript, but it would be useful for me to understand what those changes have meant in everyday practice.

[52] At the same time, Mr Davies made a point about the ability of public bodies, the Government and others, to communicate these concepts to people. We talk about the farming community now, but it could be any community anywhere, as Mr Salmon has already pointed out. A lesson that we need to draw out in this debate is the way in which we discuss and debate targets for the reduction of carbon, and how we hold a public debate on that. Some of the evidence that Mr Davies referred to from Austria could help us with that.

1.30 p.m.

[53] **Mick Bates:** The committee also went to Austria to look at ways in which we could transfer their good practice to Wales. We made our recommendations, but I must remind you that it is up to the Government to implement them.

[54] **Alun Davies:** *[Inaudible.]*

[55] **Brynle Williams:** To what extent are farmers already considering emissions with regard to methane and nitrous oxide, and how much of an additional burden would it be for them to include carbon emissions?

[56] **Mr Thomas:** Farmers are pretty aware of the methane issue. Research is ongoing into, for instance, manipulating the diets of animals to try to reduce their emissions. Studies have shown that reductions of between 20 and 30 per cent in emissions might be possible without impacting on yield, but that research is in its early stages. I believe that some of it has been going on in Aberystwyth. High-sugar grasses can also be looked at, because they give a good energy yield for the animal without having the same methane emissions. If farmers were able to capture the methane through anaerobic digestion, through better management of farmyard manures, and so on, and burn it as a fuel, that would be a win-win situation. People will still need high-quality sources of protein, and animal protein will probably be one of those for some time to come.

[57] Nitrous oxide is largely associated with fertilisers. As Dai just said, fertiliser use has been declining because of people's better understanding and education, as well as just the cost factors, pure and simple. In our evidence, we ask that the Assembly Government keep an open mind on genetically modified technologies, which may come on-stream in the future. It may be possible one day for plants to fix their own nitrogen; in fact, some already do, but, if others could, it would save considerably on the use of fertilisers and on the gases associated with their production and use.

[58] **Mr Davies:** There is a fine balance to be struck on this issue of carbon and methane. The simple answer would be just to remove the animals, but, if you take the animals off the land, you must plough that land to produce some crop or other, and figures produced by the Environment Agency show that doing that would release between about 20 to 40 per cent extra carbon. If you do not go down that route and you decide to reduce the amount of production in Wales, it would mean more production overseas to be imported here, thereby increasing carbon emissions. At the end of the day, we share the same atmosphere as those countries.

[59] **Mick Bates:** Absolutely. Huw mentioned the research in Aberystwyth into reducing methane; do you have any further information on that?

[60] **Mr Thomas:** I think that they are Department for Environment, Food and Rural Affairs research projects. I might be able to find out some more for you on that. I think that it is in Aberystwyth, but I am not sure.

[61] **Mick Bates:** There is research going on there on reducing methane from cows by including Anacine, which is an extract of garlic, in their diet.

[62] **Ms Nowell Phillips:** One issue with a lot of the grasses and enzymes for feeding is that much of the Welsh livestock is extensive.

[63] **Leanne Wood:** Sorry, could you repeat that, please? I did not quite catch that.

[64] **Ms Nowell Phillips:** A lot of the work that is currently being done on grasses that help to reduce the amount of methane that animals emit and also on feeding enzymes to reduce methane emissions from animals will make contributions only to more intensive farming. In Wales, we have a lot of extensive livestock that is not, generally, fed extra food, or we are not ploughing up land to put new grasses in, because, as Dai explained, ploughing can create major problems, particularly with carbon loss.

[65] The important point is that this is why any mitigation of climate change gases must be done on a holistic basis. The argument is that Wales is best suited for extensive livestock production, and if that means that there are areas of England with low-carbon soils that are better for arable production, then perhaps we ought to look at moving such production around the UK, to minimise the impact in greenhouse gases production because of the methane emissions. We must look holistically across the UK, so that we are not in a situation where we have to import products.

[66] **Mick Bates:** That is an important point, and the review of axis 2 undertaken by the Rural Development Sub-committee has a major bearing upon incentivising hill farming in particular. I would like to move on to the use of existing tools, and Alun's questions are directed towards the work of the Countryside Land and Business Association.

[67] **Alun Davies:** Mr Salmon, in your written evidence and opening statement you spoke about the Carbon Accounting for Land Managers initiative, and I was quite taken with that as a means of enabling land managers to measure emissions and create a profit and loss account, for lack of a better term. Could you perhaps outline how that works in practice? Could it play a part in showing farmers and other land owners the implications of their actions, and in creating baseline information on what is happening, and the impact of different practices on overall emissions?

[68] **Mr Salmon:** Absolutely—although I will pass you on to Derek, who has done far more work on this than me, and can explain it in more detail.

[69] **Mr Holliday:** At the moment, the carbon calculator is a tool for raising awareness, as much as anything else, because, as he said, there is no benchmarking information to measure it against. When you complete a carbon account, it takes the whole farm into consideration and essentially gives you an idea of where your main emissions are coming from, and where your main areas of sequestration are happening, which would primarily be woodland. It allows you to take action at a management level and look at ways of changing your management system to try to reduce some of your emissions.

[70] As for carbon accounts in the future, where there is a better benchmark the information will mean a lot more. We are at the starting point in the journey. The science needs to be developed, and will be, and the constants that are used to make the calculations will be revised as different information is gathered by the UK inventory process. In the future

there will be opportunities to look at specific land management changes and how they could be integrated into a calculator, and you could get an indication of the reductions that might be possible. In England, a group called Natural England is looking at developing an enhanced element to its environmental stewardship scheme, which will involve a carbon account and a different range of options to implement. That would receive a number of points as an incentive to look at how you could reduce your greenhouse gas emissions on farm. That is an early incentivised approach that is being looked at in England.

1.40 p.m.

[71] On what a calculator could do in future, we would like it to be able to take account of the credit that anaerobic digestion might have for your unit or business. There are many potential development stages. However, I would add that, in all of this, you must always bear in mind an integrated approach to climate change, and not focus entirely on emissions reduction, because there are other things that will have an impact, such as water resource for example. I am not sure whether that has answered your question.

[72] **Mr Salmon:** To add to that, from a layman's point of view, with CALM, in my case or that of the chairman's, where you have your own farm, if you tap in what your enterprises are, there is a little calculator at the side that goes up and down as you put in your sheep, beef, woodland and so on. The obvious answer, I am afraid, is that, the more animals you add, the more the figure on the calculator goes up. You have to put in quite a lot of timber in at the other end if you want to bring the figure down. So, for example, if you want to increase your dairy herd, to put it in simplistic terms, you will have to plant a great deal of extra woodland to mitigate the effect of the extra cows. However, it gives you a profit and loss count on that day of your position. So, for example, if you were to go into an agri-environment scheme, it would be nice to think that every farmer would use the CALM calculator to say what their position on that day was, and say 'I am going to join an agri-environment scheme. I am going to reduce this and do that over a five year period.' As far as the tool is concerned at the minute, this is what may well happen, in broad terms. From that point of view, it is a useful guide. It is not going to solve the problem, but at least people are going to know what they are doing and why they are doing it.

[73] **Mr Holliday:** Raising awareness is the first step, but the fact that you go through a process of completing a carbon account is the first step in actually effecting some sort of behavioural change.

[74] **Alun Davies:** I would like to come back to that issue in a moment, but first I wish to ask the representatives of the two farming unions whether they think that their members would welcome the use of such a mechanism to enable them to calculate their impact on the wider environment?

[75] **Ms Nowell Phillips:** It is a very handy tool, but you have to remember that, in Wales, computer use among farmers is still very low. This is always a concern when anything is brought out that involves using a computer. Although the situation is improving—slowly—the reality is that, largely due to the age profile of the industry, many farmers in Wales still do not use computers. They wait until the kids come home, and you are not going to achieve this in that way.

[76] **Alun Davies:** That is not limited to farmers. [*Laughter.*]

[77] **Ms Nowell Phillips:** On a personal level, I have done my own carbon calculation, and it does make you think, particularly the next time you change a bulb and so on. Therefore, it is an extremely important tool, particularly on an enterprise level, but we need a bit of realism. Making it available and promoting it is great, for those who have access to

computers, but we need a dose of reality because at the moment it is probably not something that the majority of farmers would access.

[78] **Mr Salmon:** I just wish to say that is freely available to anybody. You do not need to be a member—just go to our website.

[79] **Mr Davies:** Rhian used the words ‘dose of reality’, which is something that we all need really. If there were single issues, it would be relatively easy for us to reduce carbon quite dramatically tomorrow—certainly within the next year or so. However, the effect that that would have on other issues would concern me. That concerns me with many of these single issue groups. They focus on one thing, but we must remember that the countryside, the environment we live in, is finely balanced. As you have stressed yourself, Chairman, it is so important to have land managers to influence what goes on in some way. Julian mentioned the fact that, if you have an intensive dairy herd, you would have to plant quite a lot of woodland to balance the books, as it were. However, in planting that woodland, you would take some land away from the dairy side of things. You would reduce the size of your dairy herd; we are only 70 per cent self-sufficient in the UK on dairy products as it is, so you would have to import products from New Zealand or southern parts of Australia. You explain to me whether it is better to produce it here, although we may be penalised in terms of carbon levels, or to generate 10 times more carbon by importing produce from Australia or New Zealand?

[80] Those are the sorts of issues that we need to bear in mind. The words ‘to incentivise farmers’ concern me a bit, because, if you look at farming incomes for the last year or so, you will see that the average farm income in Wales was £23,500. The average payment that we had in Wales was £24,500. If you rob Peter to pay Paul, you are making one unit viable by making another unviable.

[81] **Mick Bates:** I think that we all understand that point quite well. In terms of trade, I would point out that 96 per cent of our lamb and beef is exported. So, home consumption is quite low; we depend on export as much as anyone else.

[82] I will bring Alun back on this.

[83] **Alun Davies:** I would like to move this on a bit, given the time. Another element of the evidence that we received from the CLA referred to carbon trading schemes for agriculture. You said in your written evidence, Mr Salmon, that there is potential for creating a market for trading carbon as a public good and that, in that context, the Welsh uplands could have an intrinsic value. Given what we have heard this afternoon from the farming unions, particularly on the CALM mechanism, how realistic do you think that is? Secondly, how would you see such a carbon trading scheme working in real terms, in everyday life in Welsh agriculture?

[84] **Mr Salmon:** In our evidence, we gave an example of an extensive upland farm versus an arable farm—you could also use the example of an industry. Carbon trading is already here. If you look in the papers, you will see that the carbon unit is quoted in euros on a daily basis. In America, it is happening on quite a large scale; I think that the market is worth £7 billion already. So, it is out there and working. I do not know the details of the American situation, but it is increasingly being talked about, and things that are talked about invariably come our way eventually. It is early days, but I do not see why we could not use our marginal upland areas of Wales, which have high-value environmental credits, to trade off against industrial activities that cannot provide the environmental credits that are required. Their environmental credit value is potentially greater than their agricultural value. The Welsh uplands could be supported by money from water companies, international companies or whatever. That is not beyond the bounds of possibility, even given the current state of the world’s financial markets. I think that those sorts of things will become items in the future—

perhaps not in the immediate future, but, in our view, they are a realistic prospect, not just on a Welsh basis but on a European basis. Farming unions or the CLA could be aggregators. For example, if somebody wanted to buy tens of thousands of pounds' worth of credit, we, through our membership, could say 'We can provide you with whatever it is'. That is what happens in the States; there are agents who go round collecting enough to sell to whomever it might be—Monsanto or whoever.

[85] **Alun Davies:** Would the farming unions welcome that sort of initiative? The outline is quite sketchy but, in terms of a principled approach, would you welcome further exploration and the creation of such a mechanism, and would you contribute to the creation of such a mechanism?

[86] **Ms Nowell Phillips:** We would not say that we are experts in carbon trading, but we would certainly be interested in seeing the feasibility of it in the future. The problem with Welsh agriculture is that it is fragmented, so any realistic contribution would have to involve some way of bringing in hectares. However, we would certainly welcome an initiative that looked at the possibility and feasibility of it.

[87] **Mr Davies:** We have always said that the industry itself is not a problem as far as the carbon footprint is concerned, and that it could be the solution for the carbon footprint, and that includes the intensive sector. It is well known from evidence from Australia that the intensive grassland sector is far more efficient at locking up carbon than the less intensive sector with less-grazed grassland. If you have young shoots developing all the time, you have young leaves, and the photosynthesis of those leaves is far more active than the molinia and the foggage that you often get in upland areas, and we quite often forget that.

1.50 p.m.

[88] **Mick Bates:** Do you have a reference in order to provide evidence on that?

[89] **Mr Davies:** My colleague will.

[90] **Mr Thomas:** Dai mentioned an Australian study; I shall send a link to the committee clerk.

[91] **Mick Bates:** Thank you. That will form quite an important part of our discussions on the evidence that we receive from you.

[92] Brynle, you wanted to come in on this point.

[93] **Brynle Williams:** I am interested in carbon trading. Could there be conflict with agri-environment schemes? We are talking about land abandonment. I was watching a programme recently on carbon trading with South America, which sounds ideal as it would reinstate the rainforest. It was effectively land abandonment. A company in Holland was renting tens of thousands of acres in South America to offset its emissions. However, I am cautious because there may be conflict if we go down this avenue in the UK.

[94] **Mick Bates:** I will ask Julian to answer that question.

[95] **Mr Salmon:** I would say that it is a possibility. If it paid more than an agri-environment scheme, would you go for it?

[96] **Brynle Williams:** I quite agree with you. However, as you know, Julian, many of these schemes are outside the landowners' remit. Sometimes, you have to comply with these schemes. It is not a real fear, but it nags at the back of the mind that we could come into

conflict with trying to keep the wide open spaces in Wales—and in England. You all have grave concerns about land abandonment, and this could be a way of bringing in—

[97] **Mick Bates:** I want to move on to Darren's questions. However, at this point, I will say that we have to look at it the other way around: the benefit of an agri-environment scheme to reduce carbon is that it would produce a tradable commodity, which it ultimately will. So, with regard to the agri-environment schemes, you can use the CALM mechanism to show your carbon reductions. So, there is already a mechanism to reduce carbon or keep it locked up. On that basis, we will be able to trade carbon in the near future.

[98] Darren, I would like to move on to your point relating to the Welsh Assembly Government.

[99] **Darren Millar:** My question picks up on Brynle's point. There is a tension between protecting the environment and maintaining production. Both farming unions referred to this in their submissions. It is important for us to remember that we still want to be able to export Welsh produce and to consume it in Wales. I was taken by the point that Dai has made a few times, which is about exporting production to a location where there is more carbon-intensive farming when we can do it in a lower carbon environment here in Wales. There is doublespeak from the Assembly Government on this. It talks about protecting steel production in Wales because the process produces less carbon than an equivalent process in China. The same argument should really apply to agriculture.

[100] I would like to ask you about something that the Assembly Government, in its consultation document on climate change, feels is achievable. The information is out there as the Government has produced a high-level policy statement. It seems to suggest that simple changes in practice might be able to reduce carbon emissions or greenhouse gas emissions by around 10 per cent without really affecting production. Do you think that that is achievable among your membership? If so, how, particularly if there is a cost implication? It says that there should be no cost implication and that there should just be a change in farming practice.

[101] **Mr Davies:** Going back to your initial comparison between agriculture and steel production, the reason why a lot of steel production is exported to China is that there is cheaper labour there. The reason why the agriculture industry would be exported out of Wales would be the stringent regulations that we have. There is a subtle difference there.

[102] Agriculture could make a major contribution to reducing the amount of carbon produced. As has already been mentioned, as far as windfarms are concerned, I am sure that there is a will to develop this side of renewable energy, but the handicap is that there is pressure from planning authorities not to allow this to go on. You have been to Austria and have seen what can happen, and seen the reality of it, as it were. I am sure that we could develop that side of things in Wales. A big problem that they had in parts of Austria was connecting this energy to the grid. They got around that by building communities that were dependent on what was produced. That was triggered off in parts of Austria by land abandonment or land having been set aside. Animals were removed from that land because no profit could be generated from them being there, so it was set aside. They then thought about how this land could be used and found a way of generating profit. I am sure that that sort of thing could be reflected in Wales given the right incentives. We are not talking about grants and financial incentives, but about a little co-operation in terms of planning rules. The incentive would be the fact that farmers would feel secure in knowing that there would be a long-term market for the electricity that they produced on their farms to cover the cost of investment.

[103] **Darren Millar:** On changing farming practices that do not cost a great deal, how will we incentivise farmers to make that switch so that there is no cost implication, but there is an

environmental benefit? Is the 10 per cent that the Assembly Government talks about, in terms of reducing greenhouse gas emissions in its current consultation document, achievable?

[104] **Mr Davies:** It is achievable. The carbon contribution of the industry is 1.2 per cent, so you are talking about 0.1 per cent—

[105] **Darren Millar:** But we are talking about greenhouse gas emissions here and not just carbon emissions. The Government is talking about greenhouse gas emissions and, obviously, because of nitrous oxide, methane and so on, farming is a much more significant greenhouse gas emitter. We are not simply talking about carbon are we?

[106] **Mr Davies:** No, but this paper focuses on carbon. Methane is a problem, but going back to what Huw said earlier, there are perhaps opportunities for us to work together in research and development. Huw said that we should not be blinkered when it comes to the part that GM products could play at some stage to reduce the amount of carbon, particularly in terms of fertilisers, which play a major part in agriculture. Generating energy to replace fossil fuels as far as renewable sources are concerned is another issue that we could develop in farming. However, we also need help from you and from national Government to license some of these things.

[107] **Mr Thomas:** To add to that, as I said before, knowledge transfer is important.

[108] **Darren Millar:** On the licensing processes, you referred to changes in the diet of livestock earlier to reduce greenhouse gas emissions. I understand that the licensing process is difficult and lengthy in order to get products to market. What barriers are there regarding diet on which we could make recommendations to the Assembly Government?

[109] **Mick Bates:** You can get back to us on that because you may not have that information now. Leanne is next.

[110] **Leanne Wood:** A number of you have mentioned—and we have heard evidence about this from previous witnesses—the importance of managing the existence of carbon in Welsh soils effectively. What is the best way for us to encourage farmers to do that and do you think that strengthening regulations would be a viable option for Government or should we rely on voluntary arrangements?

[111] **Mr Davies:** I am not sure what you mean by encouraging farmers to manage that. The carbon is in the soil, so you want to ensure that it stays there. That takes us back to the balance of issues in relation to livestock and production, because, at the end of the day, no matter how we tackle climate change, we must produce enough food for the population. You could legislate to make farmers move livestock from certain areas if you wanted to develop more carbon sinks and peat bogs, but you still need to produce food for people somewhere. Methane is always highlighted as something that agriculture produces copious amounts of, but methane is quite a useful tool, if you can find ways to harness it. Other European countries have found ways of harnessing it, but in order to do that, the industry, the Government and the Assembly must work together, in partnership, on research and development, and to ensure that if we do use it, there will be a market to justify the investment.

2.00 p.m.

[112] **Leanne Wood:** On the point about the Government strengthening regulations to try to help farmers to protect carbon sinks—

[113] **Ms Nowell Phillips:** I did not think that they went together—strengthening

regulations and helping farmers. *[Laughter.]*

[114] This is where we need a holistic approach across the UK because you probably could start to strengthen regulations, put in minimum stocking rates and get rid of stock off the hills in order to maintain carbon stores, for example, but as Dai pointed out earlier, that will not then take account of what you have to import and the carbon emitted by production methods employed elsewhere. Neither does it take account of the fact that Wales, generally, is the best place for extensive livestock, which is important for the biodiversity of the environment, which sometimes comes into conflict with climate change mitigation, particularly in terms of cattle. On one side you have CCW trying to encourage cattle production up in the hills—mixed farming—and then you have statements from the Assembly on climate change saying that we need to get rid of cattle because that will reduce methane emissions. This is one area where you need a holistic approach and I do not know whether regulation is the way to go. It is research and development—

[115] **Mr Davies:** It is a fine balance.

[116] **Ms Nowell Phillips:** It is a fine balance—

[117] **Mick Bates:** Briefly, could we move on to the Country Land and Business Association because I need to draw this to a close?

[118] **Mr Salmon:** Dai and Rhian mentioned regulation in the UK context. I was going to suggest the European context because we must remember that most agriculture policies are governed by European regulations, and we already have soil management plans and good agricultural and environmental condition cross-compliance issues. There are already quite a lot of controls in place, so I would agree with what they said about it.

[119] **Leanne Wood:** You do not think that there is anything additional that the Welsh Assembly Government could be doing—

[120] **Mr Salmon:** Anything additional has to take account of competitiveness and the distortion of other markets—we do not want to put ourselves at a disadvantage compared with our near cousins. On the point that Darren Millar made about reducing emissions without much effort, there was a recent study by the Scottish Agricultural College on marginal abatement cost curves for agriculture. It is beyond my simple brain, but essentially it is saying that there are things that industry can do, but they do not involve ‘nothing’. For example, it talks about the main ways that emission reductions could be achieved and suggests reducing fertilizer application in areas where it is applied in excess. I would suggest that, at current prices, most farmers are not going to be wasting too much of it. It also suggests matching the timing of application with the crop need—there is always that sort of tweaking that could go on—improving drainage to increase efficiency, and breeding plants that require less fertilizer. It says that methane reductions are expected to come mostly from breeding more efficient animals and so reducing the numbers that are required to produce the current level of output. All that is possible, but it is not possible at no cost. So, you are talking about research and development and a certain timescale. There are things that we could do and we are trying to do them, but some of them will need Government encouragement and some of them will not need so much; it is a question of education.

[121] **Lesley Griffiths:** My question is to the NFU. You mention in your written statement that your union welcomes the Environment Agency’s recent decision to alter the waste status of anaerobic digesters, which would allow farmers to use the waste without a permit. What impact do you think this move to amend the regulations will have on the installation of anaerobic digesters?

[122] **Mr Thomas:** It is just a common-sense approach by the Environment Agency, which we have welcomed. I do not think that that will have a major impact on anybody's decision on setting up an anaerobic digester plant, because I think that the biggest consideration will always be the capital set-up costs. It is a welcome bolt-on that makes it that little bit more attractive, but I do not think that it will have a major bearing on their installation. However, the waste from anaerobic digestion is a valuable fertilizer and farmers welcome the fact that they will be able to use it far more easily.

[123] **Mr Davies:** I think that I would agree with Huw on a farm basis, but, of course, if groups of farmers came together and centralised an anaerobic digester, the transport of the waste product could become a major issue if licences to spread it as an agricultural by-product had not been given by the Environment Agency. It would be an embarrassment in one sense, and a waste of valuable organic fertiliser. Once it has been through the anaerobic digester and so on, the cost of transporting it is reduced, because it is a drier product and the amount of carbon you use even spreading it on the land would be far less, because you are not transporting water.

[124] **Mick Bates:** Do you wish to—[*Inaudible.*]—the position?

[125] **Mr Holliday:** Only that we are pleased that it now fits with what the EU waste directive states.

[126] **Mick Bates:** Do you have any comments on how easy it is to put up an AD plant?

[127] **Mr Salmon:** The capital costs make it quite expensive at the moment. No doubt those will come down, but I suggest—Derek might correct me—that an incentive is needed.

[128] **Mick Bates:** What about the planning system?

[129] **Mr Salmon:** And that, too. [*Laughter.*]

[130] **Mick Bates:** On that note, I thank you for your written evidence and for answering the questions. If you have any further evidence, particularly about the difference between young growing plants and older ones, we would find it interesting. Woodlands in particular interest me, and data on that would help us to form our recommendations to the Government.

[131] I thank you all for attending. A transcript of the evidence session will be sent to you. I emphasise the point that if you have any further evidence, please let us have it.

[132] I now welcome the representatives of the Environment Agency to the table. Thank you very much for your paper. Time is tight this afternoon, as Members have to catch various modes of transport back to their constituencies or other meetings to attend, so please introduce yourselves, after which we will move straight on to questions, given that we have already read your paper.

[133] **Mr Neale:** Prynawn da, Chair. I thank the committee for giving Environment Agency Wales the opportunity to give evidence. My name is Simon Neale, and I am the land quality policy and strategy manager for Environment Agency Wales, and my colleague, Roger Wade, is one of our policy advisers.

[134] **Mick Bates:** Thank you. In view of the time, we will move straight to the scrutiny of your evidence. The abatement issues that you put in your paper are of great interest to us, particularly following the discussions that we just had with farmers' representative bodies. I note with interest that, in the figures, reducing livestock is a big issue. In fact, you say that there are three ways in which agriculture can reduce emissions: through lifestyle change, with

less reliance on carbon-intensive products, changing farming practices, or the use of new technology on farms to reduce emissions. In which of these areas can Welsh agriculture have the greatest impact, and in which areas should the Welsh Assembly Government aim to coordinate with other UK administrations?

[135] **Dr Wade:** The obvious answer to that is the reduction in livestock numbers. It is the No. 1 idea that the AEA technology report and the climate change committee have come up with. However, as was mentioned in earlier evidence, this option may not be particularly applicable to Wales, because there are many concerns that the land in Wales is much more suitable for livestock. Southern Scotland and Devon have been mentioned to me as being among the other parts of the UK where the transformation to arable would be far easier. This is why we suggest in our paper that looking at that particular aspect of reducing methane emissions from livestock really does need a UK-wide approach.

[136] **Mick Bates:** In which direction should we in Wales travel, given that a reduction in livestock numbers would be a self-defeating objective, because livestock farming forms the backbone of our agricultural industry? Which of your three options would offer the most practical suggestion for Government in Wales?

2.10 p.m.

[137] **Dr Wade:** There are potential changes in breeds and in livestock efficiency where you would not necessarily need to have a reduction in the economic potential, which could also reduce the emissions. So, there is a significant case for looking at breeds and efficiencies. That is one area.

[138] On changing farming practices, if you look at what has reduced emissions in farming over the last 10 years, it has been the reduction of livestock through the common agricultural policy reforms and less fertiliser application on the nitrous oxide side. It is these proxy-type controls that we have used for diffuse pollution, which have been the main drivers for reduction in fertiliser. So, unfortunately, as we have, hopefully, pointed out, there are not many direct controls over carbon at the moment—most of the controls happen incidentally by controlling other things, such as fertiliser application, but I am sure that that can be further progressed. Therefore, there are changes in the way in which farmers can manage. There are also new breeds and new plantings that can potentially save on emissions.

[139] Unfortunately, there is always a temptation to find one thing that will achieve the overall emissions reductions, but it does not quite work like that. It is always a case of adding up many small things to achieve the overall reductions that you are looking for.

[140] **Mick Bates:** Do new technologies have a big part to play in this?

[141] **Dr Wade:** It is a contentious area as soon as you start talking about genetically modified crops, but new technologies overlap onto that. It does not necessarily mean that everything is to do with GM crops. I would support looking at it—we need to look at everything with the caveat that GM crops raise concerns and have been of great concern to the Welsh Assembly Government in the past.

[142] **Mick Bates:** On that point, has any work been undertaken by the Environment Agency to look at growing GM crops? There is a pesticide directive coming through that will reduce the choice of pesticides to control crops. There must be big advantages in that if we were to pursue GM crops again.

[143] **Dr Wade:** I would have to come back to you on that one. I know a little about it, but a little knowledge in this area is probably dangerous, and I would be loath to go on record

about it.

[144] **Mick Bates:** There are many dangerous animals around. Does the Environment Agency have any work on GM crops that would help us?

[145] **Dr Wade:** We do not. We recognise the concerns that exist, but we also realise that you must look at every possibility when dealing with climate change. If you could have crops that fixed nitrogen, which meant that you did not have to apply fertiliser, you would have a hard equation to solve, namely which of those is more important.

[146] **Mick Bates:** So, it boils down to having root nodules on everything. Thank you very much.

[147] **Brynle Williams:** Good afternoon, gentlemen. You alarmed me a bit with what you said about livestock reduction. I would prefer, personally, the second option—although it is not up to me—but I will go on to that. As you have already heard, Wales is predominantly a livestock area. The demand for protein is increasing worldwide, so we need livestock somewhere in the world. Are we better off shipping our problem somewhere else and importing livestock, or do we need a change in farming practices? Do you agree that there is room for more movement in farming practices? You said that in plant breeding, or whatever, far more use of clovers and nitrogen-fixing plants would be a better avenue. The reduction of livestock will have a knock-on effect around the world.

[148] **Mr Neale:** In our evidence, we suggest that we need to take a UK-wide view on stocking levels and where we pursue livestock, and where we might pursue arable. We recognise that Wales is probably a good place to have livestock, in that sense.

[149] **Dr Wade:** There are quite a lot of contradictions in how you might save carbon, because one of the possibilities is to change the lay grasslands into permanent pasture, which would potentially sequester a lot more carbon in the soil. If you do that, the obvious use of that pasture is for livestock, so there are quite a lot of contradictory pressures.

[150] **Brynle Williams:** As referred to earlier, there is development in what is now the Institute of Biological, Environmental and Rural Sciences, and was the Institute of Grassland and Environmental Research, of plants for livestock feed, growing more legumes. Would that not be a better avenue to take than simply reducing stock?

[151] **Dr Wade:** It is interesting that the Centre for Alternative Technology, in ‘Zero Carbon Britain’, has suggested that a 60 per cent reduction in livestock is the way forward. That is probably fairly contentious, as there is such worldwide pressure to consume more meat, but, at some stage, we must realise that that is not sustainable. We keep saying that it is not necessarily Wales that must take that hit; what needs to be looked at is where it would be appropriate to change agriculture in the UK. However, there is pressure to reduce the amount of meat that we eat, because that is one of the key areas for carbon dioxide reduction, or methane reduction, at any rate.

[152] **Leanne Wood:** May I ask a brief question? Like the previous witnesses, you mentioned spreading this throughout the UK. How do you envisage that working? Would there be some kind of central UK plan to decide, ‘This piece of land is going to be for livestock, and that piece of land will be for growing vegetables’? How would you do that?

[153] **Dr Wade:** That is a good question. [*Laughter.*]

[154] **Mr Neale:** May I offer you a simplistic answer? There will be landscape and soil conditions that lend themselves to the growth of crops, and there will be landscape and soil

conditions that lend themselves to livestock production. So, we would start there.

[155] **Leanne Wood:** Yes, but who would decide? Who would say, ‘You have to grow this’?

[156] **Mr Neale:** I accept what you say.

[157] **Leanne Wood:** So, no answer then.

[158] **Brynle Williams:** That raises another problem in that Wales’s livestock area has always traditionally imported cereals, straw and so on from the vast cereal lands of England. Once again, you would be using more carbon by hauling food, protein and so on back over here.

[159] **Mick Bates:** I do not think there is anything to comment on in that, but thank you for that. We will move onto data and monitoring.

[160] **Darren Millar:** One of the issues that you raise in your paper is the problem of the data on which people are basing decisions being outdated. For example, you say that there needs to be,

[161] ‘An updated assessment of the distribution of organic and organo-mineral soils’,

[162] and that:

[163] ‘A reliable “up to date” assessment of the amount of carbon within the soils of Wales should be undertaken and periodically repeated’.

[164] How can we address that issue so that people are making the right decisions, based on up-to-date data that are accurate?

[165] **Mr Neale:** We have a wide range of data sources in front of us.

[166] **Darren Millar:** Some of which are conflicting.

[167] **Mr Neale:** Absolutely. According to some predictions, our soils contain 110 million tonnes of carbon. Those were 1980 predictions, and included deep soils as well as shallow soils, and they were based on a modelling approach. More research, which has been done by Cranfield University, suggests that we are looking at significantly less carbon in the top 15 cm of the soil, something like 120 million tonnes or 130 million tonnes—

[168] **Dr Wade:** The first figure should have been 400 million tonnes.

2.20 p.m.

[169] **Mr Neale:** Yes, sorry. We need to bottom that discussion out, so that we are all working from numbers that we can agree upon. We may well need to take on some work to do that. Going forward, there are already monitoring programmes in place. A countryside survey is being undertaken by the Centre for Ecology and Hydrology, which uses a number of monitoring points. The survey is carried out every five years or so. In more recent surveys, it has looked at soil carbon, which could form the backbone of a monitoring programme that would allow us to establish the effectiveness of any land management changes that we might make to preserve our carbon. Preservation is important as is carbon sequestration.

[170] **Darren Millar:** We will not make any progress unless we know where we are

starting from and where we are going. If we cannot measure where we start or any progress towards where we are going on an annual basis, we are stuck. We may as well give up now.

[171] **Mr Neale:** I do not quite agree with that. We need to do two things. First, we need to adopt appropriate measures to conserve the carbon that we have and to sequester carbon in future. We know that that we need to do that. However, parallel to that, we need to pin down what our stocks of carbon within soils are currently, and what they are going forward, because they represent a major asset to us.

[172] **Dr Wade:** The contradiction may not be as big as it seems. The 400 million tonnes quoted in the Edinburgh Collaborative of Subsurface Science and Engineering, or ECOSSE, study looked at the whole of carbon storing in Wales, while the 150 million tonnes quoted in the Cranfield report, which the Environment Agency was involved in, looked only at the top 15cm, which is perhaps the critical area of the soils that are likely to be impacted upon. So, the two might actually be the same, but I think that there is enough confusion to warrant trying to come to some sort of agreed view on the actual store of carbon. Many of these things are based on models, which, unfortunately, need data to make them work properly. Although it is a cry that you hear far too often from scientists that there are not enough data, this is one area in which there are not enough.

[173] **Darren Millar:** So, do you think that there needs to be a new study to get a more accurate picture that then needs to be used to make decisions going forward?

[174] **Dr Wade:** We are doing a bit of this sort of work. It may sound strange, but we are getting a systematic review done by Bangor University on soil carbons in relation to flood risk. Hopefully, there will be enough to see whether they can bring all this together. This is part of a process that will, hopefully, be reported on some time this year.

[175] **Mr Neale:** We know that we are losing carbon from our soils, as I think we would all agree. We know that we should be adopting measures that at least help us to preserve the carbon that we have currently in our soils and we should also be looking to measures that would sequester carbon. I suggest to you that they need to be run in parallel. We need to understand what our carbon assets are in our soils. We need to agree on that and have a figure that we can hang our hat on. However, that does not stop us from taking action.

[176] **Mick Bates:** On that point, the latest figures that I have show that land still operates as a carbon sink, and we are not actually losing carbon to the atmosphere. These are figures from the Intergovernmental Panel on Climate Change. It shows that, in Wales, we are taking carbon into the soil.

[177] **Dr Wade:** That is right. As I understand it, that does not include soil. That is what we were discussing with our colleague this morning.

[178] **Mick Bates:** Oh, I see. That is an interesting point. This is the data issue that we have, do you see? How do we know that, when we look at the data?

[179] **Dr Wade:** Absolutely.

[180] **Mick Bates:** Equally, we heard evidence earlier today that growing young grass is better than old pasture. It is quite confusing for us. When a tree grows, for example, because woodland would be a great form of sequestration—

[181] **Dr Wade:** If it is in the right place.

[182] **Mick Bates:** Exactly. In this discussion about land use, the data do not seem to be

robust enough at the moment. We need direction on where we will find robust data about sequestration, for example, and whether this figure—that Welsh soils are still taking in carbon—is robust.

[183] **Darren Millar:** Do we need to recommend to the Welsh Assembly Government that further research is needed with lots of money invested into further research if we are to get an accurate picture of what is going on?

[184] **Dr Wade:** I do not know whether it is research that is needed, but a few heads certainly need to be brought together to try to get a consensus on what is going on.

[185] **Mick Bates:** Whose heads are you talking about? [*Laughter.*] The Minister is making a statement next week—

[186] **Mr Neale:** I think it might be four statements.

[187] **Mick Bates:** That may be useful, but, if it is not insensitive to ask you, whose heads are you talking about? Come on.

[188] **Dr Wade:** The people who understand soils. We were talking to this lady from Cranfield University this morning, who was saying that people who understand soils are getting very thin on the ground; there are not many soil scientists left. So, it is a skills issue as much as anything. There are people who can go out and do the analysis but not that many who understand the issues. Those people are very few and far between, and we are losing them.

[189] **Brynle Williams:** It is interesting what you said before, about the loss of the top 15cm, because we do not know, as you said, to what depth it is. Did you say it was 40 million tonnes?

[190] **Dr Wade:** The ECOSSE suggestion was 400 million tonnes. However, that included the deep peat-based soils, which may not be quite so vulnerable to loss.

[191] **Brynle Williams:** Going back to farming practices and to surface cultivation, if we must grow cereals and what have you, it would be useful to have those data, because we are not going below those deep soils. Is it as simple as that? I am just curious.

[192] **Mr Neale:** May I just point out that the carbon in the top 15cm is the most vulnerable carbon and is the carbon that we are most likely to be losing.

[193] **Brynle Williams:** Yes, but what I am saying is that, if you are cultivating only the top soil, you will not be releasing the carbon that is below it. Does that make sense?

[194] **Mr Neale:** Yes, but the deeper the carbon, the more likely soil is to be peat based, and it is probably in the position where you would be growing cereals on it.

[195] **Mick Bates:** Lesley, may I bring you in on the protection levels, which you were interested in?

[196] **Lesley Griffiths:** In the first paper that you submitted to committee in the autumn, you talked about dividing soil-carbon protection into three levels: landscape, local and field. Could you elaborate a little more on that and tell us how you think the use of that could be encouraged? Would it need incentives or regulation?

[197] **Dr Wade:** Do you mind if I refer to my papers?

[198] **Lesley Griffiths:** No, not at all.

[199] **Dr Wade:** I will talk in general about the regulatory aspects of it, if I may. What we were really saying was that a lot of the landscape stuff is done via agri-environment schemes and by general controls, such as through nutrient analysis. The big issue is that none of this is specific to carbon. All of what the Countryside Council for Wales does on sites of special scientific interest and so on, its prescribed activities, is down to habitat management, which can be very good proxy control for carbon. However, CCW has not included any specific carbon management activities, so if you can review the prescribed activities on SSSIs, it might be useful to look at them to see whether you have some carbon control.

2.30 p.m.

[200] In addition, if you look at the key soils in Wales that actually contain carbon, you see that there are organic soils and organo-mineral soils. We have worked out that probably less than half of them are covered by habitat designations. So, there is quite a large area that does not have any specific control, only proxy control, and there may be an argument for having specific control over those. One of the biggest questions on these issues that are picked up by the NFU and the CLA is how you compensate farmers for looking after the carbon. It can be done through agri-environment schemes. That is the best way forward, and, as we said in our comments on the revision of the agri-environment scheme, we are very much in favour of option 3, which targets climate change and land use initiatives at specific areas. So, that is one way of doing it. The only other way to compensate the farmers is through some sort of emissions-trading approach.

[201] The other regulatory point that we mentioned in the paper is whether there should be a body in Wales charged with looking after carbon within the planning process. That can be done, even in an urban setting. The AEA Technology plc documentation says that there are huge potential savings to be made in urban areas through more brownfield development, and so on, but it would be very costly. However, there is not yet a statutory body to look at carbon savings. I would give the example of a windfarm development a year or so ago on peat land where the drainage was such that it was quite concerning that there would be an increased loss of carbon from the site. There is room for someone to take an overview of the carbon impact of particular developments in town and country planning, and indeed any other sort of planning. We are looking at sites of special scientific interest, and whether they work. Are the controls adequate at the moment? Could they be changed for carbon? Do you need to consider some sort of carbon management for areas outside SSSIs? Do we need to consider establishing a statutory body in Wales to comment on the carbon implications of planning decisions?

[202] **Mick Bates:** There are some interesting points there, and both Brynle and Darren wanted to come in on this. I will allow Brynle first, but please be brief, because we have only a few minutes left.

[203] **Brynle Williams:** To skip back slightly, Chair, I would like to ask about the current regulatory safeguards to ensure the protection of soil carbon, such as the conditions under the cross-compliance regime. Are you happy that they are working?

[204] **Dr Wade:** They are not really specific to carbon. They are more indirect. They do work. They have worked, but they could be reviewed so that they are fit for that actual purpose, rather than dealing with carbon by proxy.

[205] **Darren Millar:** I wanted to pick up on the issue of carbon management through the planning process, or through the regulatory framework. Might there be a place for requiring

carbon impact assessments on all planning applications, rather than the major applications having environmental impact assessments that look at these things in the round, but do not focus particularly on carbon, which means that the carbon impact may get lost? A specific carbon impact assessment could be included as part of the planning process. Would you welcome that?

[206] **Dr Wade:** We have always been supportive of taking an overview of the carbon implications of any development, major or minor. The environmental impact assessment may do the job, as you say, but it is not always adequate.

[207] **Darren Millar:** No, it is not. You gave the example of the windfarm development, and carbon obviously forms part of the environmental impact assessment, but it is not the be-all and end-all. The benefits elsewhere might outweigh the carbon negatives. I am just wondering how this can fit into the planning process without making it too cumbersome and too difficult for Joe Public seeking a planning application for a conservatory or whatever.

[208] **Mr Neale:** That is the point. There must be de minimis points, below which you rely on building regulations to deliver.

[209] **Darren Millar:** That is fair enough.

[210] **Mick Bates:** I thank you for your written evidence and for the discussion. I am ending the session with a great many more questions in my mind, particularly on the issue that we have ended with regarding data and the monitoring of carbon. It appears that the committee needs some firm realistic evidence regarding sequestration, particularly in relation to woodland and grassland, so that we can make some assessment of whether we can recommend containing and sequestering more carbon. At the moment, I am not clear that we have the data to do that.

[211] **Dr Wade:** The Cranfield report identifies five areas of sequestration. We were looking at it this morning, and the one that came as a big surprise to me was the potential within mineral extraction waste. There is a huge potential there in a very small area of land—basically on waste tip sites—to have a huge sequestration. My calculation, which I hope is right, is that it could be more than 1 million tonnes of carbon within an area representing less than 1 per cent of the land in Wales. If you got that right, you could sequester a great deal of carbon in old slate mines and so on. I hope you have the Cranfield report—

[212] **Mr Neale:** We have copies for you.

[213] **Dr Wade:** It has five key areas and these old waste sites from mineral extraction are the No. 1 area.

[214] **Mr Neale:** May I place a caveat on that, in that there will be more recent mineral extraction sites where soils have been stored for use in restoration. So, it is not quite as straightforward as that, but there is an awful lot of land where this would work.

[215] **Mick Bates:** Thank you; obviously we will need to get further information on that. I thank you again for your evidence—for the high quality of the information and for clarifying that we will need more information as regards sequestration.

[216] A copy of the transcript will be provided to you, as you know as regular visitors to this institution. You may leave copies of the Cranfield report here.

[217] **Mr Neale:** I have left you six copies.

[218] **Mick Bates:** Thank you, Simon.

2.37 p.m.

Ystyried Ymchwiliad y Pwyllgor Is-ddeddfwriaeth i'r Gwaith Craffu ar Is-ddeddfwriaeth a Phwerau Dirprwyedig
Consideration of the Subordinate Legislation Committee Inquiry into Scrutiny of Subordinate Legislation and Delegated Powers

[219] **Mick Bates:** A copy of the letter from the former Chair of the Subordinate Legislation Committee, Dai Lloyd, has been forwarded to you all with a series of questions. I know that Alun Davies is a member of that committee, so would you like to suggest how we proceed with this, Alun?

[220] **Alun Davies:** Thank you, Mick. The Subordinate Legislation Committee has a much wider remit now than in previous Assemblies due to the implications of the Government of Wales Act 2006. As a result, it has undertaken an inquiry into the way in which delegated powers are being scrutinised here and in Westminster and how we deal with European legislation. The Chair of the committee has written to all scrutiny committees asking how they currently deal with the scrutiny of delegated legislation. I would propose to the Sustainability Committee that the Chair draft a response to the questions outlined in Dai Lloyd's letter. If that is then circulated to Members, perhaps we could proceed on that basis.

[221] **Mick Bates:** Are Members happy with that? I see that you are. Thank you. I will draft that response.

2.39 p.m.

Papurau i'w Nodi
Papers to Note

[222] **Mick Bates:** There were several unanswered questions at the end of the committee's last scrutiny session with the Minister. She has now responded to those. I would direct committee members to those answers, because they contain some important evidence. There are two further papers—one from the Royal Society for the Protection of Birds and one from the British Wind Energy Association. I am sure that Members will note those and use them.

[223] The next meeting will be on Thursday, 29 January, when we will be concluding the inquiry by starting to look at the planning system. I thank everyone for their attendance this afternoon. It was a very lively and interesting session. I do not know where we are going to end up with regard to carbon figures. If anyone can find them over the weekend, please bring them along next week. Thank you.

Daeth y cyfarfod i ben am 2.40 p.m.
The meeting ended at 2.40 p.m.