



COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON PRIMARY INDUSTRIES AND
RESOURCES

Reference: Assisting Australian farmers to adapt to climate change

MONDAY, 21 SEPTEMBER 2009

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HOUSE OF REPRESENTATIVES
STANDING COMMITTEE ON PRIMARY INDUSTRIES AND RESOURCES

Monday, 21 September 2009

Members: Mr Adams (*Chair*), Mr Schultz (*Deputy Chair*), Mr Bidgood, Mr Champion, Mr Forrest, Mr Haase, Ms Livermore, Mr Perrett, Mr Sidebottom and Mr Windsor

Members in attendance: Mr Adams, Mr Bidgood, Mr Sidebottom

Terms of reference for the inquiry:

To inquire into and report on:

- Current and prospective adaptations to the impacts of climate change on agriculture and the potential impacts on downstream processing.
- The role of government in:
 - augmenting the shift towards farming practices which promote resilience in the farm sector in the face of climate change;
 - promoting research, extension and training which assists the farm sector to better adapt to climate change.
- The role of rural research and development in assisting farmers to adapt to the impacts of climate change.

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Committee met at 8.37 am**MCPHEE, Mr John Edward, Private capacity**

CHAIR (Mr Adams)—I declare open the public hearing of the House of Representatives Standing Committee on Primary Industries and Resources and its inquiry into Australian farmers and climate change. Before I commence I will ask one of the members to move that the proceedings be permitted to be recorded and that filming be permitted during the hearing.

Mr SIDEBOTTOM—I so move.

CHAIR—Thank you.

Mr McPhee—I am an employee of the Tasmanian Institute of Agricultural Research and today I am advised by the university policy that I should represent personal views, not university views.

CHAIR—Although the committee does not require you to give evidence under oath I should advise you that the hearing is a formal proceeding of the parliament that warrants the same respect as proceedings of the House. Giving false or misleading evidence is a serious matter and may be regarded as a contempt of the parliament. The committee has received your submission, numbered 15. Do you wish to make a brief statement before we begin?

Mr McPhee—No, I do not have any additions to make to the submission.

CHAIR—You have a PowerPoint presentation?

Mr McPhee—Yes.

CHAIR—That may be better than a statement! Thank you very much.

Mr McPhee—The topic being what it is I thought that a very brief PowerPoint presentation might be useful to illustrate some things. I know, Chair, that you have heard some information from colleagues of mine in Brisbane on controlled traffic farming—

CHAIR—Yes, we have.

Mr McPhee—but it may not be so familiar to other members of the committee. So I just wanted to give you a brief background on what controlled traffic farming is and where it fits in the climate situation. Basically, controlled traffic farming is a farming system that keeps all wheeled traffic in the same tracks year after year. The purpose for that is to give a compacted wheel track to operate machinery on and a friable crop zone to grow crops in.

It is very simple in its concept but can be quite complex in its implementation. This is one of the issues that we face in the vegetable industry in particular. That is the angle I am coming from, unlike my colleagues in Brisbane, who come more from broadacre grain. We have a vast array of different types of equipment. To try to keep them all in the same tracks, when they have different working widths and all the rest of it, is very difficult. But it is achievable. Some work

that we have done recently shows that under the conventional farming system we are looking at about 100 per cent of the paddock being run over by wheels. When we get it under controlled traffic we can bring it down significantly—not as far as the grain people can, but it is still a significant improvement.

The whole issue about controlled traffic and why I think it is a thing for people to get their heads around is that it really does require systems thinking. A lot of things have to come together in order to get the benefits out the bottom. I will not spend a lot of time on these. I am more than happy to provide a copy of the presentation as a PDF or something.

CHAIR—That would be really good. Thank you.

Mr McPhee—But, basically, controlled traffic is a lot about soil and water benefits. The best way I can demonstrate it is with some pictures. We have here a picture on the left-hand side taken after a conventional potato harvest and on the right-hand side a picture taken after a controlled traffic harvest. The photos were taken about 10 minutes after a storm finished, 20 metres apart. So there is quite a significant change in infiltration. It is also about reduced energy inputs in machinery and that type of thing. Once again, in the vegetable industry we are still stuck with having to cultivate, unlike the grain people, who can go to zero till. But we are talking about significant differences in fuel use between one system and the other.

As a production system—and it is, after all, a system; it is not just individual practices—there are a lot of things that can come together with controlled traffic. One of my favourites is the first point, improved timeliness. This photo, which I hope is clear enough, shows on the left-hand side a paddock which after rainfall took something like two weeks to be able to get into to work in. It took two days under controlled traffic. That is a significant advantage in any cropping system.

CHAIR—Especially in a wetter climate.

Mr McPhee—In a wetter climate, yes. There are lots of off-farm benefits out of controlled traffic as well. Obviously we are talking about climate change adaptation here, and a lot of those things are climate change type issues. I like to get on a bit of a soapbox sometimes about controlled traffic. I would contend that from a production system viewpoint controlled traffic as a basis, as a foundation for cropping, has so much to offer. It allows a lot of other things to be stacked on top of it which will then perform better.

I will, with your leave, present just a little bit of a future look. I want to stress that what we are going to see here is not a tomorrow solution or a next-week solution. But I think it is important to perhaps air the idea in the context of particularly the vegetable industry—I am not talking about broadacre grain here. If you recall those photos of the run-off, there was still a lot of wheel track area in that controlled traffic photo. One of the big challenges we have in the vegetable industry is getting that done to a sensible level. So the idea is to look at wide-span vehicles, otherwise called gantries. This is a conceptual design. A lot of people think it is pretty much pie in the sky. The reason I put it there is that they have actually been around in the past. The one on the left is actually still in use in the UK. They are all 1980s type things. We think there is nothing new under the sun, but it has actually been around for about 150 years. That machine existed on the outskirts of London. It was a steam-driven vegetable production type scenario. As I said, it is

not a tomorrow solution; it is a bit further away from that. But I think it is something really worth driving for, because it would offer so many benefits in the vegetable industry. Just in case you are wondering how they get down the road, they turn end-on and drive lengthwise—because we are talking about an eight-, 10- or 12-metre width for those sorts of things. Anyway, that is that, very briefly.

I have another couple of comments to make before we go on. I read through some of the other submissions and the *Hansard* from other hearings, and there are just four points I wanted to make. Some of the documentation makes comments about the widespread adoption of controlled traffic farming—and these are documents from institutions like CSIRO and other places like that, and even farmers—but in fact that is not the case. Zero-till as a technology is widely adopted, but controlled traffic is not, and I think there is a huge gain to be made by getting broader adoption. I think part of the reason for that is that there is confusion about just what controlled traffic means, and it leads to a bit of a ‘she’ll be right, close enough’ type attitude among a lot of people. The other thing—and I think it has probably come through in the presentation—is that the adoption of controlled traffic in the vegetable industry is going to be a very different kettle of fish to what it is in the grain industry purely because of the mechanics of it and all those sorts of things. The vegetable industry is a lot further behind the mark as far as CTF is concerned.

CHAIR—I understand, John. Thank you, that is very good. We have had a look at the systems up in the broader grain areas and seen the advantages of not compacting the soil—because when they did the research on how much they had done, they found the machinery went over 100 per cent of the paddock. Just going on from what you are saying, one of the issues that have come up is the complexity of getting machinery the same size so that every piece of machinery can go on the same wheels or tracks.

Mr McPhee—Yes, very much.

CHAIR—That is still a problem in the grain industry. Are people prepared to look at this? Are there more people starting to realise the advantages of this in vegetable production?

Mr McPhee—Of CTF? Yes. The interest in the vegetable industry has grown dramatically over the last two to three years, I guess. In conjunction with some colleagues from the Tasmanian department and another person from a private consultancy we started some work about three years ago. It has been on a very small scale to date. The total area under controlled traffic in Tasmania at the moment would probably reach a hectare and a half, but it has been a very valuable hectare and a half because it has provided us with the opportunity to—

CHAIR—Experiment.

Mr McPhee—bring growers there to have a look at the place, have a look at the soil, have a look at what we have had to do with machinery to make it work. Like I said, it is very early days. But three or four years ago, if we spoke about controlled traffic to a group of farmers, we could count the number who understood on the fingers of one hand. Now we will attract 50 or 60 people to a meeting. I think most people still bump up against ‘how do we actually do it’ in the context of the machinery complexity, but at least they understand what it is about and what the benefits can be.

CHAIR—What about the issue of regional variability, the differences between regions. That would be a major factor, wouldn't it?

Mr McPhee—Do you mean between different industries?

CHAIR—Yes, I suppose it is different industries as well as regions. Let us take soil types. Dry grain farming is a bit different to vegetable farming in Tasmania, with the variation in rainfall et cetera.

Mr McPhee—Yes.

CHAIR—Is that going to make a lot of difference, or is it just a matter of adapting machinery to make it work?

Mr McPhee—The biggest adaptation to make is at the machinery end, particularly from a vegetable point of view. If you look at broadacre grain, whether it be dry land or irrigated—but dry land is where most of the action is at the moment with controlled traffic—most growers might have maybe five pieces of equipment to get them from planting through to harvest.

We have probably 10 or 11 vegetable crops which, if you count up the suite, could require 20 different harvesters. They have different styles and designs. So that is a major challenge. With soil types—irrigated land, dry land, heavy soils or light soils—there will be differences but I don't know whether there will be differences in the mechanical side of it. The differences will be more in the management side of things. I am yet to see a soil of any description that has not benefited from the implementation of controlled traffic. Obviously, some will benefit more but it is always a positive.

CHAIR—In Tasmania there is a trend towards more contract-type harvesting. That would lend itself, wouldn't it, to this sort of process? It is one of those complexities that you spoke about—you get a system that everybody agrees on.

Mr McPhee—As is always the case, every coin has two sides. If you can get contractors who are interested and keen to run it is a huge advantage. We have achieved that situation on the north-west coast. We have a couple of contractors who are very keen to run with us. The issue is that no contractor works across the entire production system. They tend to work in ground preparation, spraying, harvest or whatever. So unless you get them all lined up you still have that barrier. If we get a keen contractor we can make some big steps quickly. Recalcitrant contractors will be a huge barrier.

CHAIR—But we saw on the Liverpool Plains and in another area a sprayer which was owned by the farmer. It was something like \$400,000 worth of equipment. The other thing which will drive this is the satellite technology, base stations and possibly the innovations from broadband as well. All those things will be drivers for this new technology, won't they?

Mr McPhee—Absolutely. You would not bother trying to do controlled traffic farming without satellite guidance. As you would be aware, most growers around the country who have moved in that direction have bought their own base stations. As you would also be aware, Victoria in particular—New South Wales is now following—is establishing CORS networks,

which give widespread geographic coverage for bases. There is no reason we should not do the same thing in Tasmania.

Those things are all advantages to going forward. You can take it forward with an individual base station—there is nothing to stop you doing that—but having that other infrastructure in place is certainly going to underpin a lot of progress.

CHAIR—And the use of broader acres—I am thinking about the expansion of irrigation into the Northern Midlands—lends itself to machinery. I think we started farming in England with long paddocks because horses kept going in a straight direction. Maybe we are going to come back to similar things.

Mr McPhee—Well, that would make some sense, wouldn't it? I guess it is also important to recognise that there are economies of scale with large paddocks but the absence of large paddocks is not necessarily a barrier to controlled traffic.

CHAIR—No. And there is also some biodiversity and other issues that we have learnt about in this inquiry, in having insect control and pest control. It is to do with having other growth around—trees and other things.

Mr BIDGOOD—I have quite a few questions, actually. One goes to costings, particularly with the machinery. What sort of costs are there in set-up and maintenance. Have there been any feasibility studies on that?

Mr McPhee—Do you mean in terms of the conversion of the machinery?

Mr BIDGOOD—In terms of what you have shown us, is anything like that happening in Australia? I come from Mackay, which is a sugar cane area, and we are very used to having things spread out. What is actually happening on the ground at the moment?

Mr McPhee—I will take that in two bits. In terms of the wide-span technology, the gantry, there is nothing happening on that at the moment. There are people scattered around the globe who are interested and very enthusiastic. I can tell you if there was one down the street for sale, I would probably buy it tomorrow, but it is a technology that is going to take a lot of developing. It might well be a thing that is supported by government along the way, but it is going to have to be done very much from the private sector point of view because there has to be a marketable product out the other end that somebody is going to make a dollar out of.

Mr BIDGOOD—You showed us a picture there, the one in the UK in the 1980s. Are they still making those?

Mr McPhee—No. The inertia of the conventional tractor industry is such that it is very difficult to turn it around. If you look at that wide-span machine, basically you have one machine there that will replace every tractor on the farm and it would probably take maybe half the cost out of every other powered implement, certainly, like harvesters and things like that on the farm. It is very much a paradigm shift. If you come back to the current situation where controlled traffic efforts are very much tractor based, in the vegetable industry there are still some significant machinery changes that would have to be made, which is the attraction of the wide-

span gantry. You have to make so many changes anyway, you wonder whether you should just make the big change and be done with it. In terms of costs we are just not far enough along the road yet to know a lot about that. What we can say as a general rule is that we will probably get rid of a fair bit of machinery because we just do not need it any more like the heavy duty tillage equipment and things like that and operating costs will unquestionably go down, but there will be some changes to the capital cost structure because of the different types of technology that are needed.

Mr BIDGOOD—Interesting. Thank you.

CHAIR—Therefore the issue of reduction in diesel fuel would be a plus when we are looking at the climate change effects of this farming and how we continue to keep farming profitable, with added costs and added inputs possibly, while dealing with the climate change challenges.

Mr McPhee—Sure. The diesel reduction is one thing and, as you can see from those figures I put up, we are talking about a 2½ times reduction and I think we can get better than that as we look at the system. There is also the fertiliser side of things, the nitrous oxides. From where I sit, I think one of the biggest advantages which is probably going to be one of the hardest ones to put a dollar figure on is just what happens with soil and water. We have much less run-off and erosion and better storage of water. It has the potential to change how we manage irrigation, which is not necessarily a bad thing, but it is going to take a little while to sort that out. We are going to make some mistakes along the way; I am sure.

CHAIR—We have had some other evidence—and that was a really interesting slide—that even in pastures where you have grasses that are not annuals, you can certainly get a retention of that moisture. I think up in New South Wales they call it harvesting moisture, which is a great concept. The other issue that I was going to ask you about was the issue of what is needed to take the research further. Is there enough government support in funding? Are you in the mix for that? Usually these things get a momentum when we can actually prove that they work, we can show farmers and contractors and I guess manufacturers of equipment as well that this is the future.

Mr BIDGOOD—I would agree with that, Chair. I would go to that question as well.

Mr McPhee—From a vegetable industry perspective—and very much a Tasmanian vegetable industry perspective because that is where I work, after all—we have done reasonably well just recently in getting funds through Horticulture Australia Ltd. A couple of years ago we got some funds to do basically a desktop study, which was to have a look at the technical limitations to moving forward with controlled traffic, and that was all stuff about machinery dimensions and farm layouts and all that type of thing. There has been an on-farm demonstration. It was funded through Cradle Coast NRM with money from NHT at the time, I guess, and Caring for Country now. That has given us a site to work with over a couple of seasons now.

We have another project which is about to start, looking at some economic modelling and greenhouse gas modelling in relation to controlled traffic versus conventional. There is another one in the pipeline but I have not heard what is happening to it at the moment. It may or may not get off the ground. It is more field demonstration stuff.

I guess one of the major limitations is that a lot of funding bodies are happy to give funds to employ staff or do on-ground work and that type of thing, but they seem to be extraordinarily reluctant to buy nuts and bolts. If you have not got the right pieces of machinery together, it is virtually impossible to demonstrate the system. I do not know what it is. I do not know whether they think that you are going to make a fortune selling second-hand equipment at the end of the project or what it is—

CHAIR—I think that it is about new thinking for research that we have not got to. That is a good point you make.

Mr McPhee—I do not have to go and buy a piece of machinery; it could just be helping a farmer into some modifications or something like that. All this work we are doing is in conjunction with growers and contractors.

Mr BIDGOOD—This is my first time to Tasmania so I apologise for leaving it so long. I am not familiar with the soil types that you have here and I suppose my question goes to how soil type and controlled traffic farming is different. Are there many differences with rainfall and so on? Can you expand on that a bit?

Mr McPhee—I think that once you have got the mechanisms in place—the actual machinery end of the situation—and you have managed to put a system in place that gives you those compacted wheel tracks and a friable crop zone, the dominant difference that is going to occur then is how you might manage the cropping cycle or manage what you do. Our soil types range from the full black cracking clay duplexes and sands through to the other end of the soil spectrum—we have got the works, though not necessarily all together. Some places are a bit brindle but others tend to be more defined.

There will be some differences in how things like the ground-engaging parts of planting machinery and things like that are used. But it has been my experience that when you get controlled traffic in place soils tend to perform more similarly no matter how diverse they might be in their original characteristics.

Mr BIDGOOD—Do you find them more stable? That is clearly evident in what you showed us—20 metres apart and there was a vast difference in the way the rain ran off.

Mr McPhee—Absolutely. Structurally they become much more stable and much more resilient.

CHAIR—So you have a site at Agfest this year to demonstrate your work and take the message out?

Mr McPhee—I do not know what we are doing at Agfest this year yet, to be honest.

CHAIR—So summing up controlled traffic: there is less water run-off and soils maintain their characteristics better than being padded down. There is less fuel usage, and you are talking about less fertiliser or less spraying—

Mr McPhee—I do not know about there being less spraying as such. There is some evidence in some areas that weed competition declines under controlled traffic but nobody really has an answer as to why that would be the case. On the issue of fertiliser usage, that is probably the case. Certainly the experience in the broadacre grain industry is that people are cutting back 20 per cent or more on fertiliser usage and still getting good yields. I think it is a combination of things there. One is probably better root exploration on the part of the plant and the other is fewer losses particularly at the nitrous oxide end of the equation where you have the sort of compacted soil and waterlogged type of environment which you would not have under controlled traffic. So it is a bit hard to say just how much less fertiliser is used but it is certainly not going to go up, if I can put it that way.

CHAIR—Thank you very much appearing today and providing your submission. We really appreciate it.

Mr McPhee—I have left with you a document that we have put together this year.

CHAIR—And you said you would leave us your slide presentation.

Mr McPhee—Yes, that is not a problem.

CHAIR—Thank you very much.

[9.09 am]

FLEMING, Mrs Aysha Jean, Private capacity

VANCLAY, Professor Francis Martin (Frank), Private capacity

CHAIR—I welcome Professor Frank Vanclay and Mrs Aysha Fleming.

Prof. Vanclay—I am employed by the Tasmanian Institute of Agricultural Research at the University of Tasmania. As we have already heard, it is university policy that people appearing do so in their capacity as a private individual.

CHAIR—That is fine.

Mrs Fleming—I am a PhD student at the Tasmanian Institute of Agricultural Research. I have been supervised by Professor Frank Vanclay and also Dr Shaun Lisson. My research is supported by the Climate Futures for Tasmania project and also CSIRO's Climate Adaptation Flagship.

CHAIR—Thank you very much. That is an exciting project to be a part of. Although the committee does not require you to give evidence under oath, I should advise you that this hearing is a formal proceeding of the parliament and warrants the same respect as proceedings of the House. Giving false or misleading evidence is a serious matter and may be regarded as contempt of parliament. The committee has received your submission. Professor, do you wish to make a brief statement in relation to that before we move to questions?

Prof. Vanclay—I might comment that it was a joint submission and that the information we are representing is largely the work of the PhD student. If it is acceptable to you, I will ask her to speak.

CHAIR—Certainly. That is fine.

Mrs Fleming—Thank you for the opportunity to appear here. I would like to summarise the key findings of my research and then emphasise three points for your consideration. As part of my PhD I interviewed 63 farmers from the dairy and apple industries in Tasmania about their thoughts on climate change. I ask them number of open questions and found that there is a wide range of understandings of climate change, a great deal of confusion about how to act, and a fair amount of distrust about climate information and programs such as the Carbon Pollution Reduction Scheme.

The first point from my research that I wish to emphasise for the committee to consider is that understandings of climate change are not related to factors of age, education, level of income, farming industry or so on, but rather values, beliefs and ideas about farming. This means that climate change is understood by farmers in a range of ways based on their own personal world views. This needs to be both acknowledged and encouraged.

The second point I wish to emphasise is that need for government to work with farmers to develop a local level social understandings of climate change—that is, involving farmers in the creation of their own information about climate change is more useful than with providing them with external, expert information. Funding appropriate extension and planning infrastructure, for example, is important. The Climate Futures for Tasmania project—and I have some information about that here, which I can provide to you—is an example of local level information about climate projections. This local level information could be useful in a process of working together with farmers to develop strategies of adaptation.

Thirdly, it is important that farmers are supported by the government in the process of adapting to climate change. However, everyone in the wider community will also need to act, so it is necessary that farmers see their involvement as part of a wider social program. Otherwise they may feel unfairly targeted or burdened.

I have recently written some guidelines to assist in communication about climate change, which I can also provide to the committee. If it would be helpful, there are now some papers published about my research that I can forward to you. That is all I would like to say. Together with Professor Vanclay, we can answer any questions.

CHAIR—Thank you very much. We will certainly take that information that you have offered to us as evidence. We will sort that out some time between now and the end of your evidence. Has there been any international research done about the social concepts of climate change on farming communities?

Mrs Fleming—Not so much on farming communities. The UK has got quite a lot of interest in public awareness and understanding of climate change but it has not focused on farmers so much. That is also quite popular in Germany. In the rest of Australia there was one study that looked at what farmers thought about climate change and how they were able to act. That was by Milne. That has been the only one that I know of in Australia. So, no, there is not so much about farming.

CHAIR—We have heard evidence from some people in New South Wales who are doing some work in the wheat areas, which is quite interesting.

Mrs Fleming—Okay.

CHAIR—How do you see government's role in making a contribution to this adaptation of farming to climate change challenges?

Mrs Fleming—I think that because it is an area that there is quite a widespread range of emotions about it is quite important that the government has a really clear message about where they stand so that people can respond to that and everyone is on the same page, so to speak, about where the government are. On top of that, it is really important that there is appropriate funding and that it is quite clearly available so that people know how they can begin to act and where the support is.

CHAIR—Of course, politics is not a defined science, and we are having our political debates in Australia at the moment. The parliament has not yet cleared our bill. One of our problems as politicians is that it is not always so simple.

Mrs Fleming—I sympathise.

CHAIR—But I guess that will come into being.

Mr BIDGOOD—Having done a social science degree myself, I am very interested in your view on and your approach to your PhD. It sounds very interesting, particularly the fact that you interviewed so many farmers firsthand. I want to get a bit more a sense of those interviews. I get the sense that there is a dislocation from what is happening globally. You obviously feel that people feel disconnected; that there is a sense in farmers of something happening to the climate, something happening with the seasons and something happening with the weather, yet somehow they do not feel part of a global solution. Can you give me a bit more of a sense of the general sorts of comments that ring in your mind? I want to get a bit more of a feel for what people are really saying. Are they saying, ‘Oh, this Carbon Pollution Reduction Scheme is a load of rubbish,’ or do they think there is actually something in it and that they are part of the whole global solution? Obviously you are saying that they are not.

Mrs Fleming—Yes. In Tasmania it gets really interesting. There is definitely a dislocation between what they see happening here and what they see happening elsewhere. I think there are a couple of reasons for that. One of them is that they think that Tasmania will be differently affected because of the special climate that we have, being an island and so on. Also, because they want to wait and see what the rest of the world does before we act, there is that real sense that we should be able to capitalise on what the UK, for example, does first, learn from their mistakes and then have the time to act later on. There is a real sense that we have plenty of time to act and we can wait and see how others do first before we do something here because the changes might be smaller here. There is a definite belief that there is more time, that we do not have to worry and that we have plenty of time.

Mr BIDGOOD—Do you hear farmers saying things to you like, ‘What I do is not going to make a difference at all’?

Mrs Fleming—Yes, absolutely.

Mr BIDGOOD—How do we change that?

Mrs Fleming—At the same time, some farmers also say, ‘We really have to do something.’ A lot of the ways in which they connect to that are about looking after their own farms for their future generations. Everyone has a different kind of take on it. While there are some who say, ‘I cannot do anything,’ there are others who say, ‘We really have to do something.’ I think that getting all the farmers together is a really useful way for them to hear each other’s thoughts. Otherwise, they are really kind of just left by themselves. That is one way.

Mr BIDGOOD—When you conducted your interviews, were they face-to-face or were they by form of a questionnaire or by telephone?

Mrs Fleming—No. It was perhaps an unusual way. I really wanted them to feel free to say whatever they felt about climate change, so I had a list of questions but they were more for prompting.

Mr BIDGOOD—But you met the people face-to-face.

Mrs Fleming—Exactly, on their farms.

Mr BIDGOOD—Did you video or record these conversations?

Mrs Fleming—I recorded their interviews—

Mr BIDGOOD—Excellent.

Mrs Fleming—and I typed up the transcripts and emailed it to them for them to comment on. Some of them added more comments as well.

Mr BIDGOOD—It sounds like an excellent methodology.

Mrs Fleming—They were really quite happy to comment. I think that because it is quite a controversial and emotional issue people really want to have their say.

CHAIR—In Australia this issue also goes to changing farm economics and usage, and that has come through to us. A young guy might come back to the farm after training and say, ‘We’re writing lots of cheques and we’re having lots of inputs into the farm: fertilisers, sprays, machinery,’ but the grandfather still sits at the kitchen table and so does the father, who probably still has the chequebook.

Mrs Fleming—And so does the wife.

CHAIR—And the wife. The young farmer is trying to deal with change and says, ‘We should change the way we’re doing things on the farm.’ He might have an awareness of climate change that the grandfather and father do not. It has been put to us that this is about the culture of farming in Australia as much as it is about information. Would you agree with that?

Mrs Fleming—Yes, definitely. There is a lot of variety and different families are different. Sometimes the grandfather sitting at the table would be really pushing climate change and saying, ‘This is not the type of weather I remember from when I was farming,’ which is really accepting of climate change. But sometimes the same family setup could have quite a different reaction, with the grandfather saying, ‘It’s just part of the way farming always is.’ So it really is about the individual farm bases and how at a social level people understand things to occur.

CHAIR—And that probably goes out to the community level, because farming is usually a community concept, isn’t it?

Mrs Fleming—Yes. If you get farmers to talk to each other and then they develop their own sense of community, you get a much better range and a much better understanding being developed.

Mr BIDGOOD—Did you facilitate groups of farmers meeting together? Did you have a forum, perhaps like this, where you got five or six farmers together?

Mrs Fleming—That is one of the techniques I used in order to meet the farmers and then to source the interview contacts, but I did not speak to them directly. That might come later, at the end of my research. But there were forums where farmers were getting together to discuss certain things, and I think that is a really useful way to go.

Mr BIDGOOD—What do you think the government should be doing? How can we help facilitate a change in attitude and a sense of involvement and interconnectedness with the global? How do you think the government should approach this?

Mrs Fleming—I think extension is a really useful method for talking with farmers and creating farming communities. Extension is really quite badly underfunded. A really good way for the government to assist would be to support these kinds of extension mechanisms to work with farmers to develop these kinds of information and adaptation options for them.

Mr BIDGOOD—Going on from that and developing the idea of networks and new technology, how techno-savvy are the farmers in Tasmania, particularly the 63 farmers that you spoke to? Are they linked by the internet, Twitter, Facebook or anything like that? These are the modern forms of networking. Are they engaged in that, or is it an older generation which is not involved in that?

Mrs Fleming—It was mostly an older generation that I spoke to, but they have children who they are keen to get into the farming life. I do not know that they are on Facebook or Twitter as much as perhaps I would be. They definitely know about it and if they see a use for it then they will be able to use it. I am not sure that is the method I would be promoting for the farming group in Tasmania.

Mr BIDGOOD—That is a very clear statement. You are saying that is not the way forward. So you do not see new technology as a new form of networking for farmers in Tasmania.

Mrs Fleming—It could potentially be one way. I do not know that it would be the most useful way.

Mr BIDGOOD—What do you think would be the most useful way? Gathering people together?

Mrs Fleming—Yes.

Mr BIDGOOD—But, if there are geographic distance and space between them, it is not easy for farmers to leave their farms, is it?

Mrs Fleming—No, but that is where the role of an extensionist can work—going to meet with the farmers. Because Tasmania is not really that large, I travelled around quite a lot to speak with farmers, and it was quite reasonable. So somebody employed to do something like that would easily be able to.

Mr BIDGOOD—I want to go to the international experience. You make reference to the mistakes the UK, Europe and the broader world community have made. What are the most glaring mistakes that we should avoid?

Mrs Fleming—Probably the expert transfer of information—not involving people and finding out what they want to do. Everyone needs to change, basically, and just telling people that they need to change creates resistance. Involving them in deciding on the ways they can change to create benefit for themselves seems much more sensible to me. That is what I would suggest.

Mr BIDGOOD—So we should avoid the expert transfer of information. It is as if there is a barrier between the expert and the everyday farmer—is that what you are saying?

Mrs Fleming—Yes, definitely.

Mr BIDGOOD—It is getting a bit too technical, a bit too scientific.

Ms Fleming—Yes. Because of the media hype about climate change, farmers talked a lot about vested interests. That was one of the things that they were really worried about. That is why I made the comment that, if you make it clear why you are giving out this information, it removes some of the problem about vested interests, because they are not trying to work out, ‘Why are you pushing this for me?’

Mr BIDGOOD—What I am picking up from you that farmers sense that, if they get engaged in carbon pollution reduction on their farms, they are somehow going to be disadvantaged. Is that right? Is that what you are saying?

Mrs Fleming—Yes. That is another key point. You can work with farmers to develop their own actions, and they do not necessarily have to be about climate change per se. They can be about best practice, sustainability or other aspects that are important to farmers but that still have desirable end results for climate change. It is about them developing it themselves to give it value focus. That is really useful.

Mr BIDGOOD—So what federal government has to do is assist local people to perceive and experience the benefits of being engaged in carbon pollution reduction. That is what we have to do. Is that right?

Mrs Fleming—I would agree with that.

Mr BIDGOOD—I look forward to a continuing debate on this. You have answered very well; thank you.

CHAIR—On issues like the drought, many farmers that we have spoken to are adapting to climate change. Some of them are well in front of science—

Mrs Fleming—Yes, definitely.

CHAIR—and are asking the questions that science needs to answer.

Mrs Fleming—That is true.

CHAIR—They may be well in advance of average farming communities. But one issue of drought that has been faced is the social dislocation and pressures. Did you pick up very much on that? Climate change could have some of those consequences. The costs and the changes to farming methods could have some major effects on farming communities.

Mrs Fleming—Yes, absolutely. The drought is a big issue for all farmers, and it is interesting that people respond in different ways in relation to climate change. But I definitely think that financial hardship is a major reason why farmers are feeling overwhelmed about a lot of things. Helping them by removing that hardship would be a big step forward, just in enabling them to consider the future. Do you have a comment on that, Frank?

Prof. Vanclay—I think something that is a little bit understated is that there is not just one type of farmer. We need to consciously remind ourselves of the diversity of farmers and the different ways in which farmers pitch their business strategies, the different values they have around what they are trying to achieve on their farms and the different ways that they engage with information—which relates to the point about whether or not farmers use Twitter. What that means for promoting change in relation to any issue, whether it is climate change or anything else, is that there is no one solution that will work for everyone. We need to be aware of the diversity that exists and to tailor the message about the change we are trying to achieve in terms of the different discourses. In fact, one of the unstated things in Aysha's presentation is that she is using a discourse methodology to study her farmers, and her conclusion in her PhD is that, by identifying the different discourses that farmers operate in and targeting extension along those different discourses, more change will be able to be effected.

CHAIR—Thank you. We have done very badly in farming communities in Australia on generational change, which has caused us a lot of problems in the past.

Mr SIDEBOTTOM—There have been comments from a number of communities throughout Australia supporting and reinforcing what you are saying about having extension programs tailored to the variety of communities, different farming techniques and so on. That just reinforces what you just said.

Mrs Fleming—That is good.

Mr BIDGOOD—It was a very good presentation; well done. The future bodes well for you.

CHAIR—Thank you both very much, and thank you for your submission. We do appreciate it, and we will send you a copy of the Hansard transcript.

Proceedings suspended from 9.31 am to 9.52 am

WILSON, Ms Deidre Maree, Acting Director, Agricultural Policy Group, Tasmanian Department of Primary Industries, Parks, Water and Environment

GRIFFITHS, Mr Hugh, Senior Industry Development Officer, Agricultural Policy Group, Tasmanian Department of Primary Industries, Parks, Water and Environment

CHAIR—Although the committee does not require you to give evidence under oath, I would advise that this is a formal proceeding of the parliament and warrants the same respect as proceedings of the House. Giving false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. The committee has received your submission from the Tasmanian government. Would you like to make a brief opening statement and then we will proceed to questions?

Ms Wilson—I will start by making a few opening remarks and then we are available to answer questions. In the Tasmanian context with respect to agriculture there are to quote, ‘known unknowns and unknown unknowns’. It is a diverse region of microclimates caused by our topography, our island status and the influence of currents and winds. We also have a diversity of agricultural enterprises, all with specific requirements. Climate change will not impact evenly across the state. It will be drier in some areas and wetter in other areas. There will be hotter and milder winters and fewer frosts, et cetera.

We may well be less impacted than many other regions, such as the Murray-Darling Basin, but because agriculture is such a large component of our gross domestic product, even minor impacts have the capacity to be felt in regional areas of Tasmania. We need resources to understand climate change and to how best assist industry. Given our limited resources, Tasmania has taken a strategic approach to considering the impact of agriculture on climate change. We are looking at identifying key issues, understanding regional and industry specific impacts to assist farmers to adapt their practices accordingly. We need to prioritise work and allocate resources.

We also need to bear in mind triple bottom line outcomes based on environmental, social and economic measures. To do this with our limited resources we have taken the approach of working collaboratively with other organisations both across jurisdictions and internal to our state. Our agency is involved in a number of national working groups and forums focused on the impacts of climate change on agriculture and finding the most efficient and cost effective means to assist farmers adapt and mitigate.

Within Tasmania our Agricultural Policy Group is working on the broader agenda in assisting government with the Wedges analysis of the Tasmanian economy, which is looking at Tasmania’s path and projected emissions profile to develop an analysis to assess our best opportunities to reduce our greenhouse gas emissions. I am not sure if you have had a submission about that.

CHAIR—I am sorry to interrupt you. Can you state that report?

Ms Wilson—The Wedges analysis.

CHAIR—Thank you.

Ms Wilson—You would have had a submission earlier today around the Climate Futures project in which the Tasmanian government is a substantial partner. We also have our Smart Farming initiative and program, which is looking to minimise the short-term impacts of the current drought and the long-term impacts of climate change on the state's agriculture sector in rural communities. Structurally we have established the Tasmanian Irrigation Development Board, which will further drive the delivery of a suite of major water infrastructure projects that are economically, environmentally and socially sustainable, with a view to dealing with climate variability.

As you would have heard in various submissions, climate change has risks but it also has opportunities. As I have just indicated, the Tasmanian government is looking at water development opportunities, and there is a Tasmanian and Australian government investment of \$400 million to deliver 240 thousand megalitres of irrigation water. That is enough water to double the irrigated land area in Tasmania and increase reliability of access for existing irrigators. This is intended to underpin an expansion in food production in Tasmania.

In conclusion whilst we are a small state with limited resources, we do have opportunities in this space, not least because we are a small jurisdiction. We are able to collaborate well across levels of government, with university and service providers and with the business community.

CHAIR—Thank you. Mr Griffiths, do you want to make any comments?

Mr Griffiths—Just referring to the opportunities that Deirdre mentioned, we certainly live in very challenging times at the moment. The dairy sector is obviously one industry that is going through a severe price pressures, and that obviously impacts on people's ability to grow and develop in the future. The wine industry is in a similar situation. Again, we see opportunities around both dairy and wine in Tasmania in the long term, but there are obviously short-term challenges. Another area where we have seen tremendous growth in recent years is in stone fruit production. Again, that will be affected by climate change impacts, particularly in areas where there may be less winter chilling—the types of things that TIAR are working on, where they are looking at low-chilled varieties and things like that. So I think it is a little hard to predict the overall impact at the moment, not until we have detailed regional modelling of the impacts of climate change and work out what sectors of the agricultural sector will be most impacted.

CHAIR—Thank you. Do Tasmanian farmers have the resources they need to deal with and adapt to climate change, to look at what their emissions are, or do we need to build some more tools?

Ms Wilson—I think the obvious answer is that we do need to continue to build tools. The Climate Futures for Tasmania project was initiated with the recognition that better and more finely scaled climate information would assist farmers and producers with risk management and decision making. It is not going to tell them what the weather will be like, as you would have heard, next week, next month, next year, but it will provide trend information and it will be at a level which will be more meaningful than any other information that is presently available.

Government recognise, through our investment in the Tasmanian Institute of Agricultural Research, that good research, development and extension are important for the gathering of information or knowledge, and then disseminating that knowledge so that people on the ground can make good decisions. I think that, as climate change is a long-term risk and issue—and, as I said, it also has some opportunities for our state—government's role will be to look at embedding adaptation in broader practice changes. Our role will be to continue to look at information gaps and see what can be done to plug those gaps. It will also be about ensuring that there is a transfer of knowledge transfer, for example, through involvement in national programs that are targeted. We look at where we think we are going to be able to contribute the most and get the best value and we will then be looking to feed that back into the processes.

CHAIR—The Tasmanian government has been looking at the different sections of agriculture. We are very diverse as a state. We do so much in agriculture across so many areas, from forestry to fishing. It is very diverse. Do we need to look at those sectional interests in a structured way as well, or are we just doing it across the board?

Ms Wilson—We are taking both approaches, because I think that climate variability and climate change impact across the board and, as you say, there are also specific sectoral issues that will need to be considered. I am not an expert in this, but, for example, some of the information that we will get from the climate futures project will look at minimum overnight temperatures, which are a critical variable for some of our stone fruits and our black currants, for example. So information is gathered at the broadest level but will have implications at the sectoral level. Hugh, would you like to add anything to that?

Mr Griffiths—Just building on that, at an enterprise level, obviously farmers in the midlands have just come through a very severe drought. Combined with low product prices for wool and livestock returns not being that high either, their ability to implement mitigation strategies is perhaps limited at the moment, and that also applies now to the dairy sector and perhaps the wine industry at the moment as well.

We do have this issue of farmers adapting to climate change in the short term. That presents a number of severe challenges. Aside from that there is some ongoing work that does offer some glimmer of hope. Some of that is around the development of drought-tolerant pastures. Particularly, there is a Tasmanian company, Tasglobal Seeds, working in partnership with the department and the university to develop more drought-tolerant pastures. There is also some work in the dairy industry. The dairy centre of excellence at TIAR is well recognised as a leader in developing pasture species that offer higher levels of palatability so that the cows will minimise methane production. Then there is the work that Deidre has already mentioned looking at winter chilling effects, particularly in stone fruit and blackcurrants. So there are some interesting opportunities, but I think, as Deidre mentioned already in the introduction, Tasmania is a small state. It has those higher resource requirements. We need to work collaboratively with other organisations.

CHAIR—Certainly with the genetics of animals it is becoming quite a debate in terms of which animals may emit less gas. Some of the producers, I think, of beef are interested in that. These things are researched over a period of years, so it is going to take some time. I am also interested in the grass. We have taken quite a lot of evidence and seen some practical sides of

that. Are there some adaptations of different grasses, like annuals going to perennials over a longer period of time in Tasmania? Is there much of that taking place?

Mr Griffiths—I am not an expert in this particular field, but from my observations there is this work going on of introducing new species. It has obviously been a very challenging environment over the last four or five years, because of the severe drought, to be able to introduce new species, evaluate them and then get them established. But I think at this stage there is a great deal of interest in some varieties that have not yet been released for commercial production. That does offer some glimmer of hope in looking at the broader areas that might be related not directly to Tasmania but to outside Australia, in terms of introducing species that are more persistent through drought but also offer higher palatability and increased production.

CHAIR—Do you think there might be an issue in that, before drought, if people had a good year they would put on more fertiliser and get more grass, but they were annual grasses, so as soon as they got with drought down they went? There is an adaptation in being able to get through a few years of much less rain. How adaptable do you think our farming community is to go that way?

Ms Wilson—Farmers and producers have proven to be adaptable. But there is no doubt that in the current circumstances the capacity and funds to introduce anything new are going to be tested for a while. If we get good spring rains, then let us see how we go. What I would like to say is that when looking at climate change and where government can get invest money, agricultural research is an area where more resourcing would be required. I have often looked at the climate change debate and said, ‘Well, how much money do you need, how much more investment do you need, to say that something is happening?’ In some areas I think it is a fairly proven science: it is going to take from 80 per cent to 90 per cent. However, in the agricultural sector, as has been seen with the debates around whether or not to put agriculture into an emissions trading scheme, this is all around getting certainty in terms of the emissions profile of the industry, inputs and outputs, the impact of transport and all those factors. Then there is the science around the actual animal production, the best food crops et cetera. As government, that is an area where investment would see value.

CHAIR—On the production side.

Ms Wilson—Yes.

CHAIR—Hugh, would you agree with that?

Mr Griffiths—Yes. I do not have anything to add to Deidre’s comments.

Mr SIDEBOTTOM—Do you think Tasmania, naturally or otherwise, has a comparative advantage over the mainland in terms of climate change and climate variability?

Ms Wilson—We have opportunities because we have water and good soils, particularly on the north and north-west coast, coming down into parts of the Midlands. We have farmers and producers who have proven to be innovative, and people are often the key to comparative advantage. The Climate Futures work will tell us a little bit about what our future risk profile is. As to comparing us against areas, you would look at regions rather than the whole of the

mainland. We may well have a comparative advantage over the Murray-Darling Basin because our impacts on our water and our sustainable yield are fewer. There are opportunities here, but just because there are opportunities does not mean there are not challenges. The recent drought has demonstrated how drying in any area impacts on productivity. Hence there was the state government's investment in water infrastructure in partnership with the federal government.

Mr Griffiths—Over the last three years we have been modelling the food industry in Tasmania, which consists of seafood and agriculture, and we have a little brochure that I can leave with you. What it has identified is that there has been significant growth in dairy, vegetables and seafood but also in some of the other industries like wine production and stone fruit. That is built around Tasmania's advantages, and perhaps those areas of production that have seen significant increases in production have been less impacted by the climate change that we know today. But in the future we see those opportunities as being enhanced through irrigation and perhaps some improved management practices. That increased value has been driven by higher prices. The significant change over the last three years is that the increased product has been directed to interstate markets and very little to overseas markets. That is probably a reflection of the high prices in Australia being driven by a very strong domestic economy and a very significant drought in a lot of dairying and fruit-producing areas in other states. If that trend in climate change continues in the future then we do see those opportunities continuing in Tasmania.

Mr SIDEBOTTOM—On another matter, in your submission under the establishment of a Framework for Action on Climate Change, you talk about supporting innovative and sustainable practices in agriculture that respond to and address climate change issues. Your measures include protecting the industry and the community against health and biosecurity risks. I wonder if you could elaborate a little more on the risk factors you see that currently exist and might exist and what structures we can put in place to guard against those?

Ms Wilson—We have a biosecurity and product integrity division. I am not well placed to answer that question. We can take it on notice and provide a detailed response. In general terms the state government takes biosecurity issues seriously, particularly for our quarantine measures. In terms of risk, obviously, there is climatic risk in terms of capacity for particular diseases to establish if you have warmer temperatures, so we are focusing on quarantine measures and looking at stopping things from entering the state.

Mr Griffiths—One specific area of great concern for Tasmania is the ability of fruit fly to overwinter. That is one of the suite of risks that Deidre has mentioned. At this stage we do not know what particular microclimates might exist or might develop where fruit fly could overwinter in Tasmania. That is part of the modelling that the university are doing at the moment in terms of looking at impacts of climate change long term. Until that detailed modelling is available, we simply do not know the impacts, particularly of fruit fly, but of a whole range of other pests and diseases that might raise their heads in Tasmania. That is something as Deidre has mentioned that the government in Tasmania are very concerned about maintaining that low pest and disease status and keeping lots of those key pests out of Tasmania. That has been critical to our market access development, particularly for fruit fly, that has allowed us to export cherries and apples to Japan, and cherries to a number of countries, particularly Taiwan and also the US, where Tasmania has a unique advantage.

Mr BIDGOOD—There are quite a few things I want to ask you particularly with recent history over the last four or five years. You did mention the wine industry and stone fruit production and how those things can be affected. Obviously, there is risk management and change management. The question I want to ask is having seen what has happened to the climate and its effect on industries particularly agriculture in the last five years, in an educated assumption of the next five years where do you think the biggest changes are going to be? Is it the fact that if it is warmer, stone fruit production may be affected because of the lack of chilling in winter? I want to know which sectors will expand and which sectors will retract.

Mr Griffiths—That is a little hard to predict given that we do not know what market forces are going to be there in the future but, certainly, we do see, if there is a recovery in prices, particularly at the moment for dairy, opportunities around increased production in dairy. Tasmania is seen as a low-cost producer of milk and probably that is not a good thing to promote at the moment. There is a complex array of factors there around world price recovery.

Mr BIDGOOD—My question is more specific to the effect of climate rather than world prices on product. I am looking at agricultural failure, say, of the stone fruits or any other particular fruits whether it is apples being affected by fruit fly or something like that.

CHAIR—One of the issues could be that climate change brings us a different time of flowering and, therefore, the fruit will come off at a different time. Usually these things are geared to a market. This is a complex area, but these are the sorts of issues that we are concerned about.

Ms Wilson—I understand. The Climate Futures project will give us information that will allow us to make some assessments around potential impacts. That work is not yet complete. We would just be attempting to answer on our anecdotal knowledge. The intent of the Climate Futures project was to start to get information that is not just 20 years out but extends out for a period of time. There is a component relating to agriculture, as you would have heard. The intent of that is for people who are knowledgeable on the subject to say, ‘What are the things that impact on cherry, apple or blackcurrant production? What are the factors that make them successful here now? Will it change in the future?’ That information will be rolled out over the next 12 months. It will not answer all questions, but it will provide information that will allow the commencement of risk assessment.

Mr BIDGOOD—I take on board what you said about the need for investment in agricultural research. I am going towards genetically modified species. Could you elaborate on how much is happening in the GM product market here in Tasmania?

Ms Wilson—We have a legislative ban on GMO products. That is the state government’s position. The government sees that as providing a market advantage.

CHAIR—How many years does that have to go?

Ms Wilson—It is five years, but I am trying to remember when the review is. I should know.

CHAIR—That is okay.

Mr Griffiths—Deidre mentioned the need for gathering more information. The other thing that might offset that is innovation. We have mentioned new low-chill varieties of horticultural crops. There may well be a range of innovation at a farm management level that might be applicable in other sectors like extensive grazing, dairy and the like that might offset that. It is a very long-term project.

Mr BIDGOOD—I would also like to ask questions about what is happening. Deidre, I think you touched on the issue of the dairy sector and particularly minimising methane from cows and the sort of feed that is being given. Could you elaborate on that, please, including the measures that are being taken and how the Tasmanian state government is helping that.

Ms Wilson—I think Hugh mentioned that.

Mr BIDGOOD—Sorry—I was just taking notes as we went along.

Ms Wilson—That is more than fine.

Mr Griffiths—This is at a very early stage of development. Already there has been a good collaboration between Dairy Australia and our research and development team at the dairy centre of excellence. The thought is around the making pastures more palatable so that it increases the utilisation of existing pastures. There are some early indications that, if you can do that, there is reduced methane production.

Mr BIDGOOD—How long has this work been going on?

Mr Griffiths—Again, I am not the expert in this field, but I think it has been considered for possibly one or two years.

Mr BIDGOOD—So it is early days?

Mr Griffiths—Yes, it is very early days. There is a need to do a lot more. It is about thinking outside the square, rather than the path we have been traditionally gone down—that is, utilising existing pastures in the same old way for many years.

Mr BIDGOOD—Obviously it is very early days, but are there positive results coming out of the research that is going on there?

Mr Griffiths—I think there are indications that it does offer a way of increasing efficiency and reducing it, but I would say that it is too early to be definitive.

Mr BIDGOOD—That sounds like quite an exciting route to follow. That is good. On a more esoteric note, you mentioned obviously seafood, dairy and agriculture as being big here. We do not often ask about the effects of climate change on fisheries. Have you seen any change in the types of fish around Tasmania at all directly due to the fact of climate change?

Mr Griffiths—Again, this is outside my area of expertise. This is something that the Tasmanian Aquaculture and Fisheries Institute—which again is a collaborative venture between the Tasmanian government and the university and work from CSIRO. The main area of concern

at this stage in aquaculture is in terms of salmon. In wild fisheries the main area of concern is rock lobster, and the industry Australia-wide is concerned about that.

Mr BIDGOOD—What are the key concerns in those particular areas?

Ms Wilson—Increased water temperature.

Mr Griffiths—With rock lobsters increased water temperature is reducing growth rates and the reproductive rates. In salmon it reduces growth rates and causes less efficient conversion of the feed.

Mr BIDGOOD—Okay, I think we will need to have a look at that in a bit more detail or get some more evidence on figures concerning the temperature of the waters around Tasmania and also the value of those industries.

CHAIR—I think only last week Minister Wong funded a project through the rock lobster association. Is that correct?

Ms Wilson—Yes, once again the Tasmanian Aquaculture and Fisheries Institute would be the appropriate body to present evidence around these issues.

CHAIR—James has a great interest in Tasmanian seafood.

Mr BIDGOOD—I love salmon. I love the omega 3 oils.

CHAIR—I would like to turn to farm forestry, which we have looked at in some other areas. Does the department leave that to private forestry Tasmania or do you have a view on that all? In the dairy industry we have seen where there could be some mitigation for dairy farmers to grow a certain amount of trees as well. Dairy farms are usually located where there is plenty of water. Do you have a view on that at all?

Ms Wilson—The policy parameters are established through the Department Infrastructure, Energy and Resources and our planning arm in terms of the protection of agricultural land policy. In terms of the protection of agricultural land policy, which is a state policy looking at ensuring that prime agricultural land is used to best value, we have supported that policy. We consider it a mechanism which allows for not only overarching policy parameters but also on-the-ground capacity for innovation.

CHAIR—Yes, it is sort of whole farm planning taking into account some tree growing as well.

Ms Wilson—Yes.

CHAIR—Hugh, do you have a view on that?

Mr Griffiths—Perhaps not a view representative of our department because this is not an area that we get involved in. But we do see the impacts at the moment with the instability of prices in

a number of sectors. The growth of plantations mainly driven by managed investment schemes—

CHAIR—I think you may be misunderstanding what I am talking about. I am talking about emissions. Farmers need to be able to have something that they can sell from a carbon perspective, whether it is soil carbon and what the soils do in absorbing carbon or having some tree growing that absorbs or stores carbon, and then maybe being able to turn that timber off as wood production. I know in Tasmania that we have the forestry commission and we have private forest, which a lot of farmers use, and we have the department. Is there a connection there?

Ms Wilson—We definitely work collaboratively across agencies in terms of the development of policy frameworks. I think in terms of the carbon offsetting potential of soils and trees this comes back to this research which is currently occurring but needs to continue in terms of understanding the quantum. I think that the department, in terms of mixed farming systems, would be keen to consider opportunities for farmers in that area in terms of mixed farm production. If people in particular can get value from retention of native pastures and tree cover then that obviously would be of interest in Tasmania because of our high level of protection.

CHAIR—We actually visited some areas in Colac in Victoria where 20 per cent of the farm had been given over to wood production without loss of production in other animal production. So it is quite interesting. Trimming those trees gave the potential for sawlog production. So there is some quite interesting innovation going on in those areas.

Mr Griffiths—It does make sense in that many farms have areas that cannot be utilised effectively which could be more productively used for plantations.

CHAIR—It is also worth looking at grain-growing areas where you put in plantations such that there are two- or three-header runs around the trees. It is a very interesting innovation process that is going on.

Ms Wilson—As I say, it is a potential opportunity. I think that, like all of these opportunities, it is about determining and indicating a relative commercial advantage. I think it is about demonstrating that the regulatory policy framework is in place where farmers can have some security that in adopting a particular approach there will be certainty around how that will be treated and returns.

CHAIR—So the extension is important. Do you feel that governments need to play a role in that area of making sure that that extension is there to carry out the new information?

Ms Wilson—Yes, the Tasmanian Institute of Agricultural Research is really our centre for excellence in agriculture. It integrates research development and extension. It is our government service provider in this area. We work collaboratively with them in terms of determining priority areas. It is a model that I think has worked particularly well in getting good value from state government investment.

CHAIR—Can you just tell us how that structure is?

Ms Wilson—Do you mean its structure in terms of governance or in terms of delivery, or both?

CHAIR—The governance—who makes up the body and who funds it.

Ms Wilson—There is a mix of funding. The state government contributes, the university contributes and those funds are leveraged. Funding sources would come from some of the research development corporations and there would be federal government funding. For example, I think last year the funds were leveraged to get \$9.9 million of external funds into the state, and I think it was \$7.7 million the year before. So when you look at those figures you can see that the model is, I believe, working well for our state and our agricultural industries.

CHAIR—It is like a CRC—a cooperative research centre.

Mr Griffiths—Extensively, that will mean that the majority of RD and E is delivered through TIAR, which is that partnership with the university. Our focus in our department is on putting information on the internet. We have dedicated FarmPoint websites, where people can access that type of information. So our focus is not on delivering services on a one-to-one basis but delivering that type of information in a way that people can access it. Then in the private sector consultants can access information and deliver the types of integrated advice that farmers need to implement at their own farm level.

CHAIR—That is important. And there is the issue of having enough graduates and enough skills coming through universities. This committee did a report some years ago on skills in regional Australia, and we are continuing to look at this issue. It does not seem that we are attracting enough in the agriculture science area. As a state department, do you see that?

Ms Wilson—I think that our joint venture agreement with the University of Tasmania to create TIAR has turned things around a great deal in that space in Tasmania. I think the last figures were that there were 180 people employed in TIAR. It gives a career path for researchers, which was possibly not there before. I think TIAR will now be looking at determining a career structure for extension officers within the institute as well.

CHAIR—We have also had farmers giving evidence to us that the private sector's extension is okay but sometimes the farmers do not trust the advice they get from the same company that is selling them the sprays and the chemicals.

Ms Wilson—Yes.

CHAIR—Sometimes bigger companies say, 'Well, our cheques are so big that they wouldn't dare give us the wrong advice,' so even they seem to have some reservation about that. Do you think there is a need for that trust perspective, where the people who are giving the advice out are seen as neutral or as not having any self-interest?

Ms Wilson—I think that the Tasmanian Institute of Agricultural Research is a good model in terms of integrating research development extension. It is focusing on the industry, not one-on-one extension. That is what has happened across institutions and overseas as well. The public funding is focused on where we can leverage the maximum value in terms of agriculture

productivity. The other issue, in terms of building trust in private consultants, I think would be an issue across all industries. I believe that TIAR, as our service provider, provides a good model for provision of research development extension to our agricultural industries.

CHAIR—Do you agree with that?

Mr Griffiths—Yes, I do. The other thing I was just going to mention was that the value of agriculture in 2007-08 was an all-time record. We have seen tremendous growth, particularly in dairy and other areas, which has led to a good deal of interest. People are now thinking about careers in agriculture, and the provision of services through consultancies and agribusiness is extending that level of expertise. I think that when we have positive times people do think about those types of careers, and the level of service is subsequently improved.

Mr SIDEBOTTOM—I was just thinking about the farmers. A lot of farmers are going out the door, but it is interesting when you get the extension officers in all this, and that career side is increasing. If we get them all together that would be fantastic.

CHAIR—Thank you for your submission and for appearing before us today. Please pass onto your minister our gratitude for the submission and for your presence.

[10.44 am]

DRIELSMA, Dr Johannes (Hans), Executive General Manager, Forestry Tasmania

VOLKER, Dr Peter William, Manager, Field Services, Forestry Tasmania

WISE, Mr Anthony, Trees on Farms Project Manager, Forestry Tasmania

CHAIR—I welcome Forestry Tasmania to give evidence today. Although the committee does not require you to give evidence under oath, I should advise you that these hearings are formal proceedings of the parliament and warrant the same respect as proceedings of the House. Giving false or misleading evidence is a serious matter and may be regarded as contempt of the parliament. The committee has not received a submission from Forestry Tasmania. I invite you to make a brief statement before committee members ask questions.

Dr Drielsma—Thank you, Chair, and thank you for making the time available this morning for Forestry Tasmania to provide a verbal submission to the inquiry into farmers and the impacts of climate change. There is a great affinity between the forest sector and the agricultural sector, particularly in rural and regional economies like Tasmania. In fact, many farmers in Tasmania are participants in the forest industry, with plantation or native forest holdings. Others grow trees as part of integrated farm management plans.

I should firstly outline Forestry Tasmania's role. We are a government business enterprise owned by the government of Tasmania and charged with the management of Tasmania's publicly owned working forests—that is, those public forests designated by parliament to be managed for multiple uses, including wood production. We manage 1.5 million hectares of state forests, which includes about 38 per cent of Tasmania's forests, the remainder being public forests managed predominantly by the Tasmanian Parks and Wildlife Service—about 31 per cent; or held by a private property owners, 31 per cent.

Of the 1.5 million hectares managed by Forestry Tasmania, over half is excluded from wood production. Forestry Tasmania manages its forests according to sustainability principles. I will leave a copy of our sustainability charter—I think you already have copies of that in the packs that have been provided—which outlines in some detail the objectives and aims that we have developed, with public consultation, to direct our management. Forestry Tasmania's environmental management system is certified to ISO 14000 and its forests are certified as to the Australian forestry standard, AS 4708.

We have adopted a proactive carbon management policy. Again, in the packs an outline of that has been left with you. Forestry is fortunate that inherent in its production processes when undertaken on a sustainable basis is the maintenance and regeneration of large areas of forests—in our case, 1.5 million hectares—which are continuously capturing carbon to balance that which is emitted during the harvest and production phase. Forestry Tasmania has modelled its carbon inventory over a 50 year time frame. This has taken into account the effects of harvesting and net growth in both commercial and non-commercial forests maintained by Forestry Tasmania, together with the carbon stored in wood products divide from these forests. It demonstrates that,

over that period, we are projecting around a 17 per cent increase in the aboveground stored carbon in our forests.

One of the areas where we know we can reduce our emissions and improve the overall carbon contribution of our forests is through the use of forest residues for production of biomass energy. We are actively pursuing options to develop such opportunities in Tasmania. Indeed, we have development approval for a biomass energy plant at our Southwood Huon site—investment ready for the right proponent.

We have been very concerned to ensure that the MRET scheme rules are based on science and that their interpretation by the regulator is consistent with the objectives of the legislation—that is, to promote the use of renewable energy in Australia. Forestry Tasmania concurs with the view of CSIRO's Dr Phil Polglase, an acknowledged expert in the role that forests play in carbon storage and sequestration. At a recent public forum in Launceston, Dr Polglase noted that afforestation over the past decade had helped Australia to meet its Kyoto targets and that there are many opportunities in Australia to plant more trees for carbon sequestration to make a significant contribution to offsetting national emissions, with additional benefits that can include wood production, biodiversity enhancement, on-farm profitability—and with least impact on water resources. Dr Polglase in a recent report to the Australian government showed, as an example, that planting trees on nine million hectares of agricultural land had the potential to abate about one-quarter of Australia's total emissions each year. The point is that there are many opportunities across Australia to establish new forests for multiple benefits and to mitigate risks. Forestry Tasmania agrees that there are opportunities to grow more trees on agricultural land, particularly if it is part of an integrated farm management plan.

I am pleased to advise the committee today that we are close to launching a new program entitled Trees on Farms. This innovative program will provide farmers with the opportunity to plant trees to reclaim weed infested land, secure a new revenue stream, capture carbon and provide long-term habitat for threatened species such as the swift parrot. This is a commercial solution to an environmental problem. Reclaiming land infested with weeds, particularly gorse, is an expensive problem for farmers, but we believe Trees on Farms converts that problem into an opportunity. In a nutshell, Trees on Farms will enable landowners to joint venture with Forestry Tasmania to established commercial wood lots on cleared land, particularly degraded land with low agricultural productivity. In the first instance we will work with individual farmers to identify suitable sites. Once these sites are identified we will then enter into a contract where we undertake to plant the trees at no cost to the farmer and the farmer undertakes to protect the growing trees from browsing animals and stock. After 15 to 20 years, when the wood lot is ready to be harvested for timber, Forestry Tasmania and the landowner will share in the revenue. If the parties agree, a new crop of trees can then be grown.

The benefits to farmers are numerous. The trees are planted at virtually no cost to the farmers. It will turn unproductive land into productive land, increase the capital value of their properties, provide a new revenue stream, improve shelter for stock and crops and offset greenhouse emissions. Farmers with land in swift parrot breeding areas can also help preserve the species. This can be done by planting blue gums near existing blue gum stands. When it comes time for harvesting, a proportion of the blue gums can be retained to provide habitat for swift parrots in subsequent decades.

I am not suggesting for a moment that tree planting on farms is a new idea. Later today your committee will see the results of a similar program 15 years ago, and most agricultural scientists agree that incorporating tree planting in whole-of-farm management plans ticks all the right boxes, providing solid commercial, social and environmental outcomes. Trees on Farms makes tree planting affordable. It is a practical solution to a range of economic and environmental issues. By linking the forestry expertise in Forestry Tasmania with landowners we are maximising the opportunity for commercial and environmental success. Such a program has the potential to significantly offset the 60 to 70 million tonnes of carbon emitted every year in Australia from deforestation, almost all of it due to clearing for agricultural purposes, while providing an income stream for farmers. I can advise that FT are undertaking the project in partnership with Private Forests Tasmania, which already represents landowners that grow and harvest timber on private land.

It is our submission that the most useful contribution governments can make to helping farmers adjust to climate change is to encourage tree planting as part of integrated farm management plans. I will leave you with a draft brochure—I think you already have it in your packs—which we intend to release publicly in the near future and which outlines the elements of that project. Thank you, Mr Chairman.

CHAIR—Thank you very much. We can start with the Trees on Farms project. I think Anthony has the carriage of that.

Dr Drielsma—He has.

CHAIR—The issues we are dealing with on this committee include the issue of farmers getting back some benefits from sequestration, some ‘carbon’ dollars, and also from taking the wood off. We have seen in some areas of Victoria that managing tree farms to make sure the trees are trimmed so they get a section of good sawlogs involves pretty intense management. There are also benefits of having trees growing on their farmland in terms of biodiversity, pest control et cetera. Maybe you could give as a breakdown on the principles of the tree farm concept.

Mr Wise—Sure. What we are going to be doing is working very closely with the farmer to fit the trees into the landscape so they do not impact on his current farming activities. We will also be assisting in identifying areas where we will not be allowed to plant due to legislative reasons. We can assist farmers in establishing carbon sinks in those areas in partnership with one of the carbon companies that are out there. With regard to the rotations, the aim is to look for a species that suits the site and to push for a longer term rotation in order to look for the carbon gains out of the site for both FT and the landowner in the future. In a nutshell, that is really how we are going to be running the program. We are not looking at high-value land; we are looking at selling the program at a very basic level where everybody can understand the benefits whether they are in the program or out of the program.

CHAIR—They tell me there has to be a certain level of canopy cover to meet international standards. Is that to do with greenhouse gases?

Dr Drielsma—In establishing the program, there will be a number of multiple benefits that we will be looking for. It is not solely a carbon project. One of the objectives that we are seeking

to achieve is to particularly contribute to the ongoing supply of hardwood sawlogs for the Tasmanian industry. You would be well aware through processes such as the RFA and TCFA that there has been a significant impact on the productive capacity of the forests of Tasmania. Forestry Tasmania manages to produce a sustainable yield of hardwood sawlogs in particular. One of our aims is to make a contribution to that.

In establishing a plantation forest, we are also storing carbon. Even if those forests are harvested at the end of a rotation, there will have been a benefit in the storage of that carbon, and there will be an ongoing benefit in the storage of that carbon in the wood products. If the forest is re-established, that carbon store will be maintained. Clearly, our objective as an organisation is to maintain an estate of forest plantations that will be there forever, in essence. Even though we will harvest portions of that forest, we will re-establish them. Therefore, there is a carbon store or carbon sink that is maintained over time. Through the various carbon programs it is possible to quantify that store. Even while you are harvesting one part, the rest is growing. You can get an average across your estate and that carbon store can be quantified and fed into a program such as the Carbon Pollution Reduction Scheme.

The other opportunity we have when working with farmers is that, as a joint venture, it becomes a jointly owned forest. So, at the end of that rotation, each of the partners owns a share of that forest. How that share is distributed to the partners at the end of the rotation can vary. One of the options is to harvest the forest and to share the dollars that come out of it. Another option, as we are exploring with the swift parrot idea, is to harvest some of the timber and leave some of it there as long-term habitat for swift parrots. There is a dividend then in terms of biodiversity. Similarly with carbon, we can take the whole crop all we could leave some of the crop. The farmer could decide perhaps to take some of his share as an ongoing retention of forest in the long term, which then could be quantified and sold into the carbon market as a long-term opportunity.

There are those flexibilities there and we will be talking with farmers as we work through this project to try to understand what the opportunities are and how we can best optimise them, recognising that, whatever we do, there will be at least 15 to 20 years where those trees will be in the ground storing carbon. That will be an immediate benefit.

CHAIR—One of the issues that has emerged are that trees sequester a lot more CO₂ in their first 50 years than after that period. Fitting that into a carbon sink, that sort of rotation period could emerge. That is some of the evidence that we have received as a committee.

Dr Drielsma—Yes, that is right. It depends on the nature of the species and the growth rates, but as a general principle trees start off a little slowly and then they really take off with a growth spurt. That growth spurt might be for the first 20 or 25 years and then they start to taper off. If you can capture that growth spurt and capture that carbon and put it into wood products and get another growth spurt growing, you are probably maximising the store of carbon. Peter is a bit of an expert on eucalypt growth so he might make a comment on that.

Dr Volker—Hans has captured it. The main thing in any farm project is a long-term relationship not only for the trees but for the owners of the land. One of the issues obviously we will face is that this is an intergenerational project on farms. We might be dealing with not only the current land owner but the next generation of a family or even a completely new owner.

There has to be some security in both the commercial aspect and the legal aspect for the owners of the land as well as Forestry Tasmania in a project such as this.

CHAIR—Thank you.

Mr SIDEBOTTOM—Congratulations on this initiative. It seems so simple, doesn't it? It has been happening but now you can make it coherent, particularly given the whole business of climate change and carbon management. In your carbon management policy statement that you have given to us and in trying to achieve your policy objectives there are two areas that I find interesting, and you made mention of them when you gave the introduction, Hans. One is to maximise timber utilisation from harvested trees to reduce the quantity of potentially flammable fuels remaining on the forest floor while ensuring maintenance of biodiversity values and, second, to promote the use of bioenergy from forest waste to offset carbon emissions from fossil fuels. They strike me as being totally interrelated. Could you take us through that, because it has implications in terms of biodiversity and climate change, particularly in terms of flammability, fires and so forth? Then there is the whole area of the use of biomass energy from forest waste to offset carbon emissions, which is in itself a controversial element of what was the MRET scheme and is now the RET scheme. Do you have any comments to make on that?

Dr Drielsma—We see the value of forest and the forest sector to climate change as sort of falling into three categories. I touched on those in my introductory comments. They are often confused and not fully recognised. The first is the actual storage in the forest and that is the one people can understand. You have the forest trees and they have the carbon. The second is the wood that is stored in the products that we use. It is probably not well appreciated that there is a very significant carbon store and a growing carbon store simply embedded in the wood products that we use in our houses and in our furniture. In fact the CRC for carbon accounting, which operated some years ago, has built a model which tracks that and it is reported as part of the Australian government state of the forests report. We know what that pool is and we know how it is growing. Even more interestingly, when forest products are finished, they are either recycled or they end up in landfill where they can persist under anaerobic conditions for a very, very, very long time. There has been research done in that CRC which has gone back and looked at landfills which are now 70 or 80 years old and they have scientifically measured that longevity of that product. That is something we understand quite well.

The third category is avoided emissions. Timber or wood is a very low energy product, so the embedded energy within a piece of wood compared to aluminium, steel or concrete is orders of magnitude less in terms of the energy that has gone into its production. So, when we build a house out of wood, not only are we storing carbon in that wood but we have saved probably 10 times—or, in the case of aluminium, perhaps 100 times—the amount that we would have otherwise spent in producing those materials. That is what has led the New Zealand government, for instance, to mandate as part of their climate change policy that all government buildings have a wood design option—for the very reason that they understand both that storage component and the avoided emissions component.

That leads us to the other question. We produce wood and, as many people in Tasmania know, when we do that, there is a lot a residue left on the forest floor. To deal with that residue so that we can regenerate the forest—and it is absolutely imperative that we do because we do not get good regeneration of the forest if we cannot manage that residue—we end up burning a lot of

that, and obviously that is a release of some of that stored carbon into carbon dioxide, which could be used for energy production. If we can take that residue and instead of burning it use it to produce bioenergy, it is actually a free kick, because we are producing energy that can replace fossil fuel that we then do not have to use. So we see that as a very significant part of not only reducing our reliance on burning and therefore the smoke and emissions that are produced as a result but also more efficiently using that forest production to further reduce our use of fossil fuels. So we have done a lot of work on that.

The recent passage of the MRET scheme will now provide greater certainty for some investment in those sorts of activities, and we are seeing that emerge around the globe. In Europe now, the use of woody biomass for the production of energy has skyrocketed. I was over in Europe earlier in the year talking with some of the experts in this area, and they were talking about a 2.5 times increase between now and 2012 in the use of woody biomass for the production of both residential heating and electricity. We are starting to see that here, with proposals in Western Australia and South Australia for the production of pellets for export back into Europe, into Belgium and the Netherlands and, more recently, Finland. That does not seem to make an awful lot of sense to me—taking it halfway around the world—but we could be producing it here for our domestic markets, and that is certainly something we have been very actively pursuing.

Again, providing those sorts of markets provides another opportunity for trees on farms to fully utilise the production on the farms to create that offset. So it comes back to what you were saying earlier, Chair: it is not just necessary to maintain the carbon stock on the farms, where we grow those plantations; if we are actually using that wood to replace materials that have much greater emissions then we are also getting that benefit.

CHAIR—Do you know if anyone has produced a table showing the input of energy in aluminium, iron and concrete—you missed out plastic—that we could get our hands on?

Dr Drielsma—Certainly. I have access to such a table. I think it was printed in one of the documents that the CRC for Greenhouse Accounting did. Perhaps we will get you a copy of that—

CHAIR—Perhaps you can take that on notice.

Dr Drielsma—or a reference to where that is available on the web. But there are some very good illustrations of that—both tables, as you say, looking at the different materials, and graphs looking at a typical house construction and asking, ‘If you used wood for these components compared to concrete, steel or aluminium, what would be the relative carbon emissions,’ and that is quite revealing.

CHAIR—It is. Before I give Mr Sidebottom the call, I want to make the point that I have fought a couple of battles about that. When they were building the Olympic facilities in Sydney, wood was pushed out as a part of the specifications because of this foolish argument about not using wood. It is interesting that we have now turned that upside down. I just wanted to make that point.

Mr SIDEBOTTOM—Just a point of clarification—and I may be a little confused on this—in returns to the carbon credits for bioenergy or biomass energy under the former RET Scheme, was that accepted as a RET relationship—that is, you could claim wood waste in terms of cogeneration and you could actually use it to get credits? How far advanced are we on this?

Dr Drielsma—There were certainly some doubts as to the interpretation of some of the regulations—

Mr SIDEBOTTOM—That was last year.

Dr Drielsma—and there are certainly rules around that relate to the source of any wood—as to whether or not it is from an RFA approved forest operation on a sustainable basis or whether it is material that might have a higher value for some other purpose. The interpretation of those rules, I guess, was at best difficult for a proponent who was seeking to establish, before they invested many millions of dollars, whether or not they would get credit for it. One of the difficulties early in the scheme was that the regulator would not provide an opinion on that until after you had made the investment, which was not very helpful. I understand that that has now been resolved and clarified and that the regulator is able to provide a decision on that before an investment is made.

In seeking to clarify that, some years ago we invested in a very small, modest biomass energy plant, a gasifier, that created electricity from wood residues at our Tahune AirWalk, and we generated a RET and had it recognised and certified. That was a process by which we were able to establish there is a pathway through the regulations. We think that it is most important that that be the case, otherwise we will not be able to optimise across Australia the benefits from using forest material for biomass energy production.

Mr SIDEBOTTOM—Thanks for that. I think that it is well worth putting that on the record that industries need certitude in order to move forward and it just seems to make some sense. I have two other comments, if I may. How much coverage would you anticipate in terms of forestry in Tasmania—and no doubt you have scenarioed this—with a fair take-up of trees on farms in Tassie? Again, there are the positive benefits and opportunities available in terms of wood production as well as carbon storage and the environmental benefits of this in Tasmania.

Dr Drielsma—The opportunities are quite significant in respect of land area but it is ultimately going to be an economic question regarding the relative value for agricultural production and forest production and where that mix is. Our aims are relatively modest in this. We are talking about perhaps thousands of hectares over a four- to five-year period that we would be aiming to achieve. I think our initial targets are probably in the order of 2,000 or 3,000 hectares—

Mr Wise—Five thousand.

Dr Drielsma—over the next few years. It is a modest target. But remember that, since we are the ones who are going to be putting in the finance for this, we are limited by our own capital availability to be able to do that, recognising that returns for us are going to be 15 or 20 years into the future. Having said that, I think the opportunities are much larger and we are not necessarily the only players in this field. Particularly if a carbon price starts to emerge that is

quite significant, this could drive a lot of other investment as well. It could make it much more attractive to see other players entering into this arena.

Mr SIDEBOTTOM—Finally, I was interested—we were talking about it earlier—in who owns the credits. I noticed that you had a 70-30 split in terms of costs with your arrangements but you made it clear as we went on that when and how you ascertain the carbon credits depends on where you are in the cycle, when you make the arrangements and what the price is later and so forth. I was just wondering whether you had done any more work in terms of who owns the credits. That could well be a very significant component in the uptake in this.

Dr Drielsma—Yes. I might get Anthony to talk a little bit more about the specifics of this but in some ways it is still early days. A lot of people talk in glowing terms about the windfall profits and revenue streams that will come from this carbon—

Mr SIDEBOTTOM—I am not one of those, by the way.

Dr Drielsma—It is all going to depend on what sort of model we end up with. The carbon pollution reduction scheme provides an opportunity for opting into that scheme, and therefore having some recognition of credits. A lot of the parameters around the protocols, the measurement and how you deal with risk, have yet to be finalised. And that will determine to some extent who is best placed to own those credits and how they will translate into an outcome. For instance, trying to maintain continuity of carbon credit means that those credits and the liabilities that go with them—this is a proposal coming out of the CPRS—are most likely to be related to the titleholder of the land. So it is being proposed that the titleholder would have the ongoing liability if somehow those credits disappeared. That would suggest that the titleholder is going to want to keep control of the credits, to a large extent, if they have to have the long-term liabilities. I think we have to work out all of those issues in commercial terms.

Before the CPRS gets up—recognising that we are still a little way off getting that finalised—there is the voluntary market. I think Anthony made some references to some of the schemes. We are investigating some of those voluntary market mechanisms. There are various standards and schemes that would provide accreditation or certification for a carbon credit but when we really fully understand how those schemes operate we will know who will best benefit from those sorts of credits. The Australian government, through its Greenhouse Friendly program had such a scheme for the certification of voluntary carbon sinks. Unfortunately for us, that scheme has been wound up, I think in anticipation of the CPRS coming on stream, which means that there is not an official Australian government scheme that we can now look to for this program. So we will need to look at these voluntary schemes to see whether they provide a short-term opportunity pending the CPRS.

Mr SIDEBOTTOM—I was just curious whether in modelling this you are looking at what they do in Europe in terms of ownership of the carbon credits. I do appreciate that it is speculative. We do not have regulations, protocols et cetera.

Dr Drielsma—Ultimately it is a commercial matter. Theoretically anybody can own them. It just becomes a benefit from that investment. So when you are looking at the costs and the benefits of who gets the best value out of that it will be a commercial arrangement. We could negotiate an agreement where we own all the carbon credits, we share them, or the landowner

owns them all. And then that might be offset by different arrangements as to who owns more or less of the timber. Anthony perhaps you could say what thinking we have already given to this program at this stage. It is early days.

Mr Wise—It is very early days. As Hans said, we are exploring the different mechanisms by which we can look at the carbon issues. One of the limiting factors is that having the carbon calculated or credited is a very expensive process. For this kind of project, where the hectares might vary from five hectares on a property to 150 hectares, it might not be worthwhile going down the road of trying to establish how much carbon is coming off the five hectares for FTs benefit, and rather give that benefit to the landowner.

A lot of the benefit in the carbon will come through the biodiversity side of things. We can get value to people now, through biodiversity, through the carbon issues, through habitat rehabilitation. But, again, it depends on which scheme you look at when trying to calculate the carbon value. That is really where we are now. We are going through the different schemes that are available. We are looking at the different formulas, and we are going to see which best fits our scenario and use it. We are very negotiable on it, and we will use it in that way.

Dr Drielsma—The values on the voluntary market for carbon are not high at the moment. We know that through the CPRS we are talking about it now being proposed for an initial period of a year or two. The value might be capped at, say, \$10 per ton of carbon. The voluntary schemes are probably delivering prices below that at the moment. That is not an awful lot, really, to cover some of the costs that Anthony is talking about. You really need to have quite a scale to be able to afford those upfront costs for a scheme. That is what we are investigating.

CHAIR—We have the Chicago listings, the models and the volunteer processes in the United States, but it is the regulation cost, and that is where we need the integrity.

Dr Drielsma—Yes, so whether it is the official CPRS, which will have legal regulatory requirements, or a voluntary scheme, such as the voluntary carbon standard or the gold standard, there are a number of international standards that exist for different purposes, and they all have a bureaucracy around them, and they all have a certification process that requires an audit, and all of that incurs cost. We are trying to figure out whether any of those provide a viable option in the shorter term.

Mr BIDGOOD—First of all, having spent 20 years in the printing trade, the production of paper does interest me. I notice in your carbon management policy that one of your objectives is to promote recycling to prolong the working life of paper and other carbon fibre products. Can you expand on that? In what way you are doing that? I know you are touching on this. How is that happening right now?

Dr Drielsma—We just participate in schemes, like any business does, to maximise the recovery of our office papers through commercial dealers who collect and recycle it. We are participating in those schemes like any other business.

Mr BIDGOOD—That is good to hear. I also admire the quality of your print work, as well. That is very good. It is obviously on recycled paper.

Dr Drielsma—Actually, if I might draw attention to it, this paper—and I think I am right in saying this, because it should be mentioned here somewhere—has been produced according to the Australian Forestry Standard, so it will be certified paper which will have, no doubt, some recycled content but also virgin fibre that has come from certified forests through that process. I think—and it should be recorded somewhere—that it actually is Tasmanian paper.

Mr BIDGOOD—It is very good production—that is what I was saying. I notice on page 13 of the Sustainability Charter that there is a background overview and the statement:

In June 2007, Forestry Tasmania voluntarily chose to stop converting native forest to plantation in State forests and there has been no new broadscale clearing of native forest in State forests since 31 December 2006.

How do you see the future of that? Do you think that will be kept? Will there be no new clearing?

Dr Drielsma—Absolutely. That is our policy. It is a requirement of our certification. The Australian Forestry Standard has a provision in it that requires no broadscale clearing of forest areas that are certified, and we intend to maintain our certification under that system. So, yes, that is a long-term commitment.

Mr BIDGOOD—Figure 3 on page 13, on eucalyptus plantations and regrowth, goes right through to 2095, when it says there are going to be 500,000 hectares of eucalyptus forest in Tasmania. Is that correct? Am I reading that right?

Dr Drielsma—Absolutely. We manage our forests on sustainable yield. We have quite complex computer growth models, as well as an extensive system of inventory through our forests, with over 3,000 plots where people go out to measure the trees and then we model those. Typically, we model for a period of about 90 years and we do it every five years. We did it in 2006; that was our last formal reworking of all of that. So we modelled the forest from 2006 to 2095 using this modelling process to determine what is the amount of timber that we can extract from the forest on a sustainable basis without reducing the capacity of the forest to continue on forever.

Mr BIDGOOD—And obviously without broadscale clearing as well.

Dr Drielsma—Correct.

Mr BIDGOOD—What would you say would be the natural age of taking a tree down?

Dr Drielsma—It varies. In a eucalypt stand it could be anywhere from 60 to 100 years.

Mr BIDGOOD—So it is a long period of time.

Dr Drielsma—It is a long period of time. In our plantations it is a shorter period of time, so we are looking at 20 to 25. This graph here demonstrates that, at the end of that 90-year period we have modelled, the range of forest types is broadly similar to what we have today. Each of these is essentially an age category of forest, with the eucalypt plantation being the very youngest, then we have got natural regrowth that is less than 30 years old, then from 30 to 60,

and then this is the mature forest that you referred to. What we are demonstrating is that over that period of time we are managing the forest and extracting timber from it in direct comparison to its ability to grow. At the end of that period the forest will still have both the extent and the character that it has today because we are not harvesting it any faster than its ability to regrow.

Mr BIDGOOD—I cannot remember the source of this because we have had so many submissions, but I remember seeing a submission that said the ideal time of taking a tree down with its value insofar as taking carbon out of the atmosphere was something like 15 years. Am I right in saying that?

Dr Drielsma—Fifteen years seems a bit early and it would depend on the growth rate of the tree.

Mr BIDGOOD—And the type of tree?

Dr Drielsma—And the type of tree. Typically, every living organism has what is called a sigmoidal growth form. It starts off, goes very slow and then tapers off. A tree—

Mr BIDGOOD—Exactly the same.

Dr Drielsma—has that sort of growth. When it is in that steep growth curve there is a point of maximum, if you like.

Mr BIDGOOD—That is what I am trying to get to.

Dr Drielsma—If I harvest the tree at this point and then replace it with another tree I will maximise the amount of wood and of carbon over time. Typically, that is before it gets to the flat stage; when it is in its steep curve and it is just coming out of the curve. You can calculate this mathematically, and you can do it either in terms of the volume of carbon or the volume of merchantable wood or the value. Depending on which factor you optimise, you will get a slightly different point. If you do that and then you continue to do that over time you will maximise your output.

Mr BIDGOOD—Obviously, government's key concern is to get carbon out of the atmosphere and get carbon emissions abatement. What is the type of tree that is best to use? In Tasmania you have chosen eucalyptus as being the key tree. Is there any other species that perhaps could be planted anywhere else in Australia which takes in more carbon than perhaps another species would, or are they all pretty equal so far as the species of tree is concerned? Are all trees equal?

Dr Drielsma—No, not at all.

Mr BIDGOOD—It is interesting that you said they are not.

Dr Drielsma—But in any location there will be a suite of trees that are best suited for growth in that area. Particularly when you add concerns about biodiversity, water and other things, you start to limit what sorts of trees you would best grow. Trees vary in density, for instance. A eucalypt tree is more dense than a radiata pine tree. On that basis, it is probably best to plant the eucalypt because it is going to have a higher density and more carbon as a result. But whether

the eucalypt is suited or the pine is suited then depends on how quickly they grow and where they grow. So there is no easy answer to that.

CHAIR—There is also an economic aspect.

Dr Volker—There are all sorts of things that come into it, including whether the tree can survive. For instance, in Western Australia there is a big program to plant *Eucalyptus polybractea*, which is a mallee species. Most of the carbon is going to be stored underground in the root systems, whereas in Tasmania, where we have good rainfall, we will probably plant commercial species. But there are dryer parts of Tasmania where we might not put in a timber producing stand; it might be purely for carbon. So it might be a species that is unsuited to commercial timber production but has a high wood density that sequesters a lot of carbon and provides a biodiversity benefit. Like any agricultural enterprise, it is about matching the right species to the right site and with the right purpose in mind. If we are growing trees, we have to think about not just the short-term prospects but also the long-term prospects. As you say, we are thinking in 50- to 100-year cycles. You will see today where things have worked and also where things have not worked.

Mr BIDGOOD—Industrial complexes that are being established and those that are already in existence are looking to offset their carbon emissions. They will perhaps be looking to invest in particular types of forest. What is the most efficient way of growing trees and getting carbon out of the atmosphere? What is the best type of tree for a particular landmass? You mentioned the mallee species in WA, and I am aware of what is happening in WA. How do you see the future? I asked previously about genetically modified species. Have you done any work in that area at all?

Dr Drielsma—No.

Mr BIDGOOD—Is there a ban on that in Tasmania at the moment?

Dr Drielsma—Yes.

Dr Volker—I can speak with two hats because I am also on the Tasmanian government's interdepartmental committee on genetic modification. There is currently a moratorium on GMOs in Tasmania.

Mr BIDGOOD—I understand that is for the next five years.

Dr Volker—Yes. It has just been renewed, as I understand it. From the point of view of GMOs in forestry, in a previous life I was involved in research in that area. There has been nothing done in Tasmania, I might add, but the CSIRO in Canberra did quite a bit of work in the mid-nineties. The view in forestry in Australia and in most developed countries around the world is that GMOs are not worth the effort politically. For a start, it is very difficult to do. Secondly, community acceptance would be a huge hurdle to overcome, especially in the case of putting eucalypts into the Australian environment. Maybe in Brazil and other parts of the world, where eucalypts are exotics, it might be more acceptable. But certainly in Australia that would be very unlikely and it would not really be worth the effort to go down that path.

Mr BIDGOOD—This is a government inquiry and we are asking experts such as you about the best way to reduce carbon in the atmosphere—through farming and various methods. Is it feasible to genetically modify a species of tree to maximise the amount of carbon it takes out of the atmosphere, or is that pie in the sky?

Dr Volker—All genetic modification does is stop the tree from getting a disease or some other thing. The tree has a maximum capacity to grow wood and absorb carbon. Whether or not it is genetically modified is probably beyond the point—there are a lot of other things that can happen to a tree.

Dr Drielsma—I do not see that as a very significant issue. There is no simple answer to the questions you ask and I think it would be very dangerous to seek to get a simple answer to that. The fact is that in any particular locality and in any particular economic or social circumstance there will be viable options for establishing trees on farms. It will be a relatively simple matter to identify those options with the existing tools and species and germ plasms that we have available to us. I think the social, economic and biological questions will overwhelm that equation, and seeking some sort of super tree is really not the point that we should be looking at at the moment. It is to ask: can we use the existing tools and the existing species in a way that makes sense economically and socially to integrate them into our farming landscapes.

Mr BIDGOOD—That is good. You have clearly answered my question. Thank you.

CHAIR—Old growth forests do not sequester very much carbon. Is that because the older the tree the less sequestering that it does?

Dr Drielsma—When we talked about that curve, an old growth tree is up here at one point—

CHAIR—Say, of 300 years old.

Dr Drielsma—It depends on the species; it depends on all sorts of things. You would expect in general that at that stage you would have the maximum store of carbon because the growth is there, but at some point the ecosystem gets into balance. There is decay, respiration and growth that sort of balances it all. In time, you would expect in some Tasmanian circumstances, certainly where eucalypt starts to die out and perhaps rainforest becomes more dominant, a reduction in carbon over time. But there are two elements. There is the flow of carbon dioxide, so you maximise the flow in a young tree so that the sink is working at its maximum. But, in terms of the store, there is no doubt that an older forest is going to store more than a younger forest. So we have to keep those two things in balance.

CHAIR—This question should probably go to Anthony. Some areas in Tasmania have lots of gorse, which is a major problem. If you tree cover some of the areas in the farmlands, is that an opportunity to overcome some of the gorse and the blackberries?

Mr Wise—Absolutely. Currently I am investigating the land prep before we plant and I am looking at the benefits of doing a two-year land prep on gorse before we even put a tree in the ground so as to really try and knock it back and get control. You will never eradicate it but you get better control by doing proper land prep and knocking it and blackberries out at the same

time if possible. Getting tree canopy cover as fast as possible also shades the competition out, so it is very beneficial.

CHAIR—We have come across some areas which get wood growth and woody weeds and things. Have you thought about the opportunity of using bioenergy to get those if that could be used in that process as well?

Dr Drielsma—It is part of the thinking. In getting a sufficient core supply into a bioenergy plant it is likely that a proponent would be looking at the full range of fuel sources that might be available. That might not just be forest residue but agricultural residues and potentially urban and other industrial residues that might feed into that. Certainly, once you have got that capacity then, yes, the control of gorse or woody weeds could provide an opportunity, if there is a way, of harvesting that, chipping or whatever and then introducing it into the fuel stream. All of that becomes possible and highly desirable as long as the economics of the fuel value and the transport and harvest costs are comparative with its value as a fuel source.

CHAIR—Thank you very much for your submission and for answering our questions. We will make sure you get a copy of the transcript. Just one more thing before you go: are you doing some work on the carbon life cycle analysis in your forest carbon accounting?

Dr Drielsma—Forest and Wood Products Australia, which is the R&D corporation for the forest sector, has initiated a study on the life cycle of wood products. As part of that, CSIRO have been doing some work and they used one of our forests as one of the inputs into that. So, yes, we have been providing that. That report has not been finalised—

CHAIR—Okay. We will wait.

Dr Drielsma—but we did get some preliminary feedback, or results, on our component on that and we are incorporating some of that into our annual sustainability report this year. We expect that the report will come out of Forest and Wood Products Australia some time in the next few months or so. It is a very important work.

CHAIR—It is. Thank you.

Resolved (on motion by **Mr Bidgood**):

That, pursuant to the power conferred by section 2(2) of the Parliamentary Papers Act 1908, this committee authorises publication, including publication on the parliamentary database, of the transcript of the evidence given before it and submissions presented at public hearing this day.

Committee adjourned at 11.42 am