



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**

WEDNESDAY, 28 OCTOBER 2009

CANBERRA

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**HOUSE OF REPRESENTATIVES**  
**STANDING COMMITTEE ON PRIMARY INDUSTRIES AND RESOURCES**  
**Wednesday, 28 October 2009**

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

**Members in attendance:** Mr Adams, Mr Forrest, Mr Perrett, Mr Schultz, Mr Sidebottom and Mr Windsor

**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.

**WITNESSES**

**GIBBS, Mr Mark, General Manager, Climate Change Policy Branch, Climate Change Division,  
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**GRANT, Mr Allen, Executive Manager, Agricultural Productivity Division, Department of  
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**HOPKINS, Mr Angus John Malcolm, Director, Adaptation Research and Capacity, Department  
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**JOHNSTON, Mr Christopher Peter, Assistant Secretary, Adaptation Innovation Branch,  
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**MORTIMER, Mr David, Executive Manager, Climate Change Division, Department of  
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**Committee met at 5.11 pm**

**GIBBS, Mr Mark, General Manager, Climate Change Policy Branch, Climate Change Division, Department of Agriculture, Fisheries and Forestry**

**GRANT, Mr Allen, Executive Manager, Agricultural Productivity Division, Department of Agriculture, Fisheries and Forestry**

**HOPKINS, Mr Angas John Malcolm, Director, Adaptation Research and Capacity, Department of Climate Change**

**JOHNSTON, Mr Christopher Peter, Assistant Secretary, Adaptation Innovation Branch, Department of Climate Change**

**MORTIMER, Mr David, Executive Manager, Climate Change Division, Department of Agriculture, Fisheries and Forestry**

**CHAIR (Mr Adams)**—Welcome. 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 itself. Giving false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. The committee has received your submission, which it has numbered 70. I now invite you to make a brief opening statement, after which the committee will have some questions for you.

**Mr Mortimer**—We probably do not need to make a formal statement. From memory, we had a briefing with the committee some months ago, before the public hearings, at which we set out a number of elements of our programs across both portfolios. I guess you are aware that responsibilities for these activities are shared between the two portfolios and both have programs that are designed to facilitate adaptational research.

**CHAIR**—One of the things that have come up is our capacity for organising research in Australia and whether we need a national overview committee for all research on climate change and the work done in the rural sector. What are your views about that? Do we need something in order to coordinate and give direction to make sure we are not duplicating our research?

**Mr Mortimer**—In terms of the agriculture sector as a whole, Minister Burke has set up a top level R&D council that deals with all the issues across his portfolio sector. Mr Grant can take you through how that is structured and operates then perhaps, if you like, we can have some comment from our colleagues in DCC about the agriculture side. My sense is that probably Minister Burke's R&D council is the body that best fills that role at the moment, but I am happy to hear comment from others about that.

**Mr Grant**—The minister has established the Rural R&D Council to provide advice to him on rural R&D investment and priorities across Australia. One of the tasks that they need to deliver on is a rural R&D investment plan. It is not an easy task and it is designed to look across the current R&D model. The government puts over \$200 million each year into the rural research and development corporation model through matching levies but the task of the council is to look more broadly than that at how rural R&D is directed, at the needs of our rural constituents,

at what further opportunities might there be to put funding into rural R&D either through public investment or private investment, at what other mechanisms exist in other sectors of the Australian economy that might be appropriate to adopt into the rural sector to increase the amount of funding into rural R&D and to provide broader advice on priorities for rural R&D funding. Climate change will be picked up in that advice but it is not a specific target for the advice that the minister is looking for from that council.

**Mr Mortimer**—In dealing with proposals for expenditure under the Australia's Farming Future climate change research program the minister has specifically sought the advice of that council on those funding proposals, so he is engaging and using that council to give him advice on what is coming forward in terms of the proposals coming forward for expenditure across the sector.

**Mr Johnston**—To add to that the Department of Climate Change has an interest through the National Climate Change Adaptation Research Facility which is a partnership between DCC and Griffith University which was established in November 2007. The NCCARF has eight themes of which primary industries is one and they have established a research network under each of those themes, including primary industries, and that is led by Professor Snow Barlow at the University of Melbourne. They are currently working on a national adaptation research plan for primary industries and we expect to see a consultation draft towards the end of this year with a final currently scheduled to be completed around April or May 2010.

**Mr Mortimer**—In terms of linkages between activities Professor Snow Barlow is also the chair of the advisory committee that the minister has established to give advice and recommendations on the projects to be funded under the climate change research program.

**CHAIR**—This committee has heard a lot of evidence from looking at broader social and community aspects of the drought that we have had recently and the social needs of rural Australia. In Tasmania we had a look at Rural Alive and Well, a Tasmanian suicide prevention program that has been funded federally and also through the state area. Does the department have anything like that that it has put into its mix? I am talking about the change in rural Australia and the pressures that come in to the social side of life.

**Mr Mortimer**—Absolutely. The government is presently doing a major review of drought policy, which Minister Burke has been leading. As part of that there was an expert panel set up to specifically examine the social pressures in rural areas resulting from drought. That was headed by Mr Peter Kenny previous head of AgForce in Queensland and comprised a number of people with expertise in the area. That report has been provided to the government. That will form part of the government's consideration of future drought policy.

In terms of the present arrangements, there are programs that are funded specifically through the Department of Human Services to provide mental health and other capabilities out in rural areas. They are mostly channelled through Centrelink, and they have a delivery role in terms of those activities. We can certainly get you more information on them if you like.

**CHAIR**—I was really looking more at the broader policy framework.

**Mr Grant**—There is a small program under Australia's Farming Future which is a community networks and capacity-building program focused on increasing the leadership and representative capacity of target groups. The target groups include women, youth, Indigenous Australians and people from culturally and linguistically diverse backgrounds. It is trying to strengthen primary industry productivity and build rural and regional community resilience in a changing climate. That is a small program that is sort of directed in that path. I think \$2 million has been allocated to that program in 2009-10.

**Mr SCHULTZ**—In your submission, on page 12, you talk about sustainable farm practices as one of six priority investment areas under Caring for our Country. You go on to say:

The 2009-10 sustainable farm practices targets aim to increase the adoption of sustainable farm practices such as those that maintain or increase soil carbon, groundcover and vegetation on-farm as well as reduce the risk of erosion and soil acidification.

How long has it taken the department to come to that conclusion? Have you come to that conclusion in the last couple of years or have you been looking at these issues for the last four or five years or the last decade? How long has this process been within the department? I ask the question because we have seen in our evidence-taking across the country some very significant on-farm practical examples of how great this issue is.

**Mr Mortimer**—I will make some comments on that, which is not directly within our responsibility but I am generally aware of those programs. The government and previous governments have had programs in place, either Caring for our Country or its predecessor programs, which have had a strong focus on issues about groundcover, vegetation management, risk of erosion et cetera for a number of years. That has continued under Caring for our Country. It probably is fair to say there has been increasing attention more recently on issues to do with the soil carbon and issues around carbon in soils in particular, and that is therefore reflected in the 2009-10 target areas. So soil management and dealing with the soil and the groundcover that keeps it in place have been a focus of activity for some time, but with the increasing focus on climate change and adaptation issues the carbon elements of that are getting more to the top of the pile.

**Mr SCHULTZ**—Is there enough investment in the Caring for our Country component of your report to adequately cover the demand to fund projects within the sustainable farming practices priority area?

**Mr Mortimer**—I will have to take that on notice in terms of the actual funding; I do not have that data with me. It is not a program that I manage, nor does Mr Grant. Suffice it to say I am sure the money is being spent. The amount that is set at the end of the day is an issue for government on the advice of its advisory bodies and suchlike.

**Mr SCHULTZ**—I have a shorter question on the same issue. Is Caring for our Country a good basis for a sustained response to a long problem like climate change? Do you have any thoughts on that?

**Mr Mortimer**—I would suggest it would be. It is establishing target areas and the approach at the moment, as I understand it, is to ensure that resources are directed at those target areas.

**Mr SCHULTZ**—In the executive summary of your submission you say:

Coordinated national effort by governments, agricultural industries, regions and individual producers will be required to put in place a sound climate change strategies to ensure that agriculture is able to effectively manage the risks associated with climate change.

Would anybody like to elaborate on that or make some comments related to that particular part of your executive summary?

**Mr Gibbs**—I can refer to the work that is going on now under Australia's Farming Future with the Climate Change Research Program: Mr Johnston has also referred to the work that is happening at present under the national framework on adaptation. That is quite a large undertaking to coordinate work in the primary industry sphere. In terms of Australia's Farming Future and the Climate Change Research Program, we have announced a number of projects this year which look at aspects of soil carbon. They look at how farmers can manage their nitrous oxide emissions. They also look at how they manage livestock emissions—which is mainly methane. There is also a large area of investment in how cropping systems and how managing beef herds and cattle herds in both northern and southern Australia will be impacted by climate change and how there are potential movements for some small industries around Australia. A lot of work has been commenced there and is underway. That work brings together scientists. It brings together the CSIRO and those organisations that are part of our RDC framework. For example, MLA is involved in that work. GRDC is involved in that work. Dairy Australia is also part of that work. They have quite good extension networks, which can extend the results down to farmers. Indeed, we are also using farming bodies such as the Birdchip Cropping Group to discuss issues of adaptation in their particular region. More broadly, in Australia's Farming Future, there is also FarmReady. But I will hand over to Mr Grant to talk about FarmReady, which is in his area.

**Mr Grant**—FarmReady has two components. One component allows individual farmers to attend training courses that are directed at farm business practices and provide specific education and learning about how farmers can adapt their own circumstances to variations in climate change. Courses would include some technical aspects of adaptation but there would also be courses directed at a range of business skills and broader management skills and abilities. Under that program, farmers can receive up to a \$1,500 repayment for expenses incurred in attending those courses. That is the reimbursement side of it. There is also a component—

**Mr SCHULTZ**—Can I just interrupt there for a minute: \$1,500 reimbursement for what initial outlay?

**Mr Grant**—If they spend up to \$1,500 they can get back what they spent. If they spend more than \$1,500 they can get back a maximum of \$1,500. So it is really up to them how much they choose to spend. There has been quite a large response to FarmReady. I think we are about to acknowledge the 5,000th participant in the FarmReady program within the last 18 months. That is a very significant response.

The second component of FarmReady provides industry groups, including Landcare groups and landholder groups—that is, groups of farmers or landholders who might just band together to form a group—up to \$80,000 to enable them to develop tools, education facilities and

communication facilities through which they can then transfer those skills and techniques to the farmers within their area. They can develop capacities and build systems and learning techniques—

**CHAIR**—Communication type things.

**Mr Grant**—Communication and on-the-ground techniques so that they can demonstrate those to the other people within their communities or to the groups that they represent. It is \$80,000 to groups around the country, and that is on a competitive basis. There is a call for expressions of interest for grants under FarmReady and there is a process by which those grants are determined and agreed.

**Mr SCHULTZ**—I am most impressed with DAFF's commitment to the process of farmers being able to adapt to changes because of their long involvement with climate variability—they are the words that I like more than the other words. Do you think their capacity to cope with climate variability is receiving, perhaps in the way of the extension of services and other services from government, sufficient assistance for them to maintain the professional approach they take to climate variability and overcome the short-term negative outcomes of climate variability?

**Mr Grant**—I think the capacity is there, but whether farmers choose to take it up is really up to them. It is there in programs like FarmReady, it is there in the extension services that are still provided mainly by the state governments and it is also there in the increasing number of economists and other business services that are provided by the business sector. Companies like Landmark and those sorts of people are really extending their abilities and skills and availability to take farmers through some of those key issues. So I think the capacity is there, but, in the end, farms have to choose to access it.

**CHAIR**—Farmers tell us that they get concerned about whether they can trust advice from the private sector.

**Mr SCHULTZ**—And about the costs associated with it.

**CHAIR**—Yes. Some people say, 'With the cheques we write we're big enough for them to know that if they tell us lies and we find out, if they tell us to spray and to put more on them we need to, they will lose us.' But, among smaller people, there is a lack of trust or acceptance in that process, which we have changed in the last 15 to 20 years.

**Mr Grant**—It has certainly change from previous times, when you would not come to government for advice because 'What would they know about farming practices?'

**CHAIR**—That is not entirely true.

**Mr SCHULTZ**—There was a lot confidence in government extension services in the past, I can tell you.

**Mr Grant**—State governments in particular—that is absolutely true.

**Mr SCHULTZ**—I have one final question that relates to the point you made about individual farmers getting together in a group and delivering outcomes. One of the concerns I have as a rural based member is that, despite the magnificent work being done by, for example, the landcare movement, there appears to be a significant amount of costly promotional material advertising what a great job they are doing. Those resources could be better targeted towards delivering those positive outcomes or the exercises that attain those positive outcomes. Do you have any comment to make on that?

**Mr Grant**—No. But we hear the message and we understand the problem.

**Mr SCHULTZ**—It is a serious question.

**Mr Mortimer**—I understand, but it is an issue that governments have to determine, and all governments are concerned about communicating information and messages. It is not something that we can directly influence.

**Mr SCHULTZ**—Okay, I am finished on that.

**CHAIR**—I will make a comment on that. We do have a Publications Committee here in the House. Having sat on the Publications Committee, I know that we have pretty strong guidelines on bringing down reports. As the secretariat of our committee would know, you cannot waste money on flashy colours and other things. Maybe we need to get that message out there.

**Mr SIDEBOTTOM**—But I do admit they are pretty la-di-da.

**Mr SCHULTZ**—Yes, they are.

**Mr SIDEBOTTOM**—I am interested in the climate change research program. With the leverage of the funds that we have, we are nearly at \$100 million. That is really good. I notice there are four major areas of research. Have you got the expertise amongst you to give us a bit of an update? I know it is only reasonably new, but I think the committee would like to know about the soil carbon program. It would certainly like to know about the nitrous oxide program, the reduced emissions from livestock research program and finally the adaptation research program itself. It would inform us as we go about policy and debate in this place.

**Mr SCHULTZ**—Does that include flatulence?

**Mr SIDEBOTTOM**—That was a big word here—‘reducing emissions from livestock’—flatulence, yes.

**Mr Gibbs**—I will step through the programs and areas of work you have identified. With soil carbon, there was a \$10 million investment made under the soil carbon research program. By the time we had investment from the CSIRO and the state DPIs, we had leverage up to about \$20 million. That program of work is about soil sampling in a strategic and targeted way that looks at farm management practices. We also look at places where we are certain that a farm management practice has been going on for some time and compare them to fields where that practice has not been occurring. That is important from a science point of view so that we can start to make some scientific judgments about how soil carbon has increased over time with that

practice. Across Australia we target cropping, vegetable growing in Tasmania and different types of farm practices. We have coverage across Australia except for the Northern Territory.

There are a lot of samples that have just started being undertaken in this area. There have been some hold-ups because it is currently the part of the season when the crops are in the field, so we cannot have our scientific experts going into the field, but our samples have started. We are developing a standard methodology run by the CSIRO so we can compare different results under different practices across the country. There is a lot of debate about soil carbon at the moment and about how different practices can significantly increase carbon. What we are trying to ascertain is how those levels of carbon can increase. It is not just factors such as what you might be deciding to grow at one point in time; there are also environmental factors, which are very important when it comes to soil carbon. Very significant natural disturbances such as droughts or bushfires, for example, can have an impact on soil carbon.

Our work on nitrous oxide is similar to the work we are doing on soil carbon. Again, it is looking at different types of farming practices and how we measure nitrous oxide. In the past we have tended to use a methodology which basically involved measuring from a bucket in the ground—I do not know if you have ever seen it. We have now replaced that with things called automatic chambers which allow for nitrous oxide emissions which vary based on night and day, so we can get much better calibration of what is happening out in the field and over time.

**CHAIR**—Moisture?

**Mr Gibbs**—Yes, the soil quality and the moisture, looking at application rates and at different types of practices such as having the crop on mounds.

**CHAIR**—Raised beds.

**Mr Gibbs**—Raised beds, yes. So it is all those different practices, ranging from sugar cane to other types of cropping systems. We have that being led by GRDC. There is also a strong connection between the nitrous oxide program and the soil carbon program, because those two gases are related in how you manage soil.

The third one that you raised was the livestock program. That is being headed by Meat and Livestock Australia. That is another coordination hub where we have a number of activities going on, both in the extensive area and in the intensive area. We are looking at different types of management practices ranging from feed supplements to looking at productive traits for different animals. How we actually measure methane is an issue; ‘looking at the science of the gut’ is my expert way of putting it. That is quite a complicated area.

**CHAIR**—Or the guts.

**Mr Gibbs**—The guts, exactly. That is a big area of research, again. Methane emissions are probably one of those areas where it is going to take some time to get answers, but the way we are coordinating the work involves using, again, universities and the extension networks that Meat and Livestock Australia has. We do not have results coming out of that program yet, because it has just started, but we aim to have some results in the near to longer term.

**Mr WINDSOR**—Do you have any historical evidence on soil carbon or is this just starting?

**Mr Gibbs**—No, because you can only increase soil carbon over very long time periods and our program invests four years; the chances of measuring any increases in soil carbon over four years are quite minimal. What we have done is to try to target those sites where we have data on the history of the farm practices, so we have reasonable certainty that that practice has been occurring on that piece of dirt for a long time.

**Mr WINDSOR**—Is the Glen Innes research station one of those?

**Mr Gibbs**—We had already announced the research program and gone through all the expressions of interest by that time, so we did not have anything from Glen Innes at that point in time.

**Mr WINDSOR**—They have evidence going back to 1931, I think.

**Mr SCHULTZ**—They are well recommended.

**Mr Gibbs**—We have New South Wales. I think they have a New England facility that is involved in our program. We have highlighted the Glen Innes trials that have been going there for some time.

**Mr FORREST**—Could the witnesses go to page 6 of the submission, box 2? There are two tables given, table 1 and table 2. It comes out of ABARE's information, and the commodities are the same in each table. Table 1 is the decline in production of key Australian agricultural products with no mitigation, and then there is the decline in key Australian agricultural exports, but most of those commodities are exported. I am wondering why you have sought to highlight the difference. What is the significance there?

**CHAIR**—Is this an ABARE table?

**Mr Mortimer**—Yes, this is straight from an ABARE publication.

**Mr Gibbs**—You are correct in saying that a lot of these areas are exported.

**Mr FORREST**—Perhaps one refers to tonnes and the other to dollars. It is that it?

**Mr Grant**—It just shows the different impacts on the industries because of their export dependency.

**CHAIR**—It is about impacts of adaptation and mitigation, isn't it?

**Mr Grant**—Yes. When you see the impact of climate change on beef across the board being 10 per cent, because beef is highly dependent on exports the impact on exports is 30 per cent.

**Mr Gibbs**—Of the export market.

**Mr Grant**—Yes.

**Mr FORREST**—It is even more striking for sugar. Anyway, that was just a little aside.

**Mr Mortimer**—We can come back to you on that. I suggest that the production measure was used as a percentage because it can relate to tonnes, litres or anything and gives a standard indicator. In terms of the other table, the only common denominator would seem to be dollars, but we will come back to you on that. It is scene setting, in that it is talking about the challenge ahead.

**Mr Gibbs**—The key point about that table is that it is about what happens if no action is undertaken. In that sense it is a worst case scenario.

**Mr FORREST**—My anxiety is about those programs that were being conducted by Land and Water Australia, as well as other programs. What I am looking for is some level of confidence from you that there is not overlap happening—that there is not work going on there that is similar to what is going on here—and that somehow there is overarching coordination. Can you satisfy the committee on that?

**Mr Mortimer**—That is a hard one to give absolute satisfaction on. There is a lot of research going on and it happens at different levels. From our point of view, we do our best to provide frameworks for that. All the activities that the government funds are linked as best we can through frameworks to help ensure that people are communicating and understand what they are doing. Unless someone else is braver than I am, I never give a commitment that everything is perfectly aligned and coordinated. The R&D corporations, particularly the big ones, have very significant investments in their different areas. They also tend to organise it around themes. If you look at the strategic plan, the annual operating plan or the annual report of, say, MLA or GRDC, you will find that they have suites of activities identified. The other initiative that has been set out is what is called CCRSPI. I might ask Mr Gibbs to talk about that in detail. It was established initially under Land and Water Australia but has now been transferred to Melbourne university. That is a communication network to ensure the linkage is done. Is there any detail on CCRSPI that might be helpful to the committee?

**Mr Gibbs**—I think the classic example of how CCRSPI has worked, and the benefit it has provided in coordinating activities in climate change science and research, is that through the program that we have just been talking about—with the methane in the soil and the nitrous oxide—a lot of the RDCs coordinate their activities when putting their bids forward through our process. CCRSPI was set up to assist in that process. Land and Water Australia chaired CCRSPI and it brought together relevant RDCs, universities, state DPIs and DAFF as well. So there was a coordination of research activity going on.

**Mr FORREST**—What about the corporate knowledge? You have one young PhD beaverling over there and you have all those files of research and numbers that were collected. It is not that you subcontract it to Melbourne university; it is about those records and information.

**Mr Grant**—The records for Land and Water Australia will be maintained. They will be available through the DAFF website. People will still be able to go in and search under Land and Water Australia, and they will be able to find the complete history of Land and Water Australia's

publications. Physically they will be maintained in the cotton RDC because there are some common approaches and systems that exist there. A lot of the people that worked on LWA, most of whom have found jobs, will end up somewhere else in the system, and we would hope that some of the lessons and experiences they had in LWA will then be transferred into those new organisations. All of the major programs that LWA ran—in fact more than 90 per cent of all the individual projects that LWA ran—will be either completed or transferred to other institutions to be completed.

**Mr PERRETT**—Earlier you talked about the \$100 million in the Climate Change Research Program—\$40 million from the government and \$60 million from other sources—and I think you referred to crops and how there was nothing happening in the Northern Territory.

**Mr Gibbs**—No, I was talking about soil carbon.

**Mr PERRETT**—Sorry; soil carbon. I was just wondering if you could respond to the suggestion that most of this money would be going towards adjustment and placation rather than innovation and opportunity. I am particularly interested in how much of the money would be spent, say, above the Tropic of Capricorn, in the northern parts of Australia.

**Mr Mortimer**—I might have to come back with the details on that, but in terms of innovation, as opposed to adjustment, I think we would argue that the Climate Change Research Program is very much focused on innovation because it is actually collecting new information and testing that in ways—as Mr Gibbs outlined earlier—that have not previously been done. That should provide the basis for new understandings, and new understandings should hopefully lead to innovation and doing things differently.

**Mr PERRETT**—But not in the Northern Territory?

**Mr Gibbs**—We have a couple of projects there. In terms of what we do in the adaptation space, we do have a couple of projects which look at the potential for industries which may want to move from one location to another. The only examples we have are of relatively small industries which have done that.

**Mr PERRETT**—Peanuts?

**Mr Gibbs**—Peanuts are the example that we have used and we are looking at that as part of our research program in more detail—the decisions about the location, some of the social aspects of that—and we are looking at what it means from an emissions perspective in how you farm. The benefit of that study was that there was a case management that we could actually look at in some detail. I would have to go back and look at the detail about where it goes to the Northern Territory, but we are also looking at the Burdekin and some of the crops there—I think tomatoes were one of them—and just trying to get a handle on industries which are talking or seriously thinking about moving. It is quite a large decision for farmers in those areas, and we are just trying to get a handle on the vast array of issues which are confronting them.

**Mr PERRETT**—Just to tease that out a bit more, obviously the squeaky wheel will attract the funds because they will want to adjust to climate change, but it is hard to get a noise coming out of where the opportunities might be. Would that be a fair comment?

**Mr Mortimer**—The thing is to develop learnings and be able to put those out on the basis of the case studies that Mr Gibbs talked through. I do not want to sound as though I am playing a line, but governments are not necessarily the leaders in opportunities and—

**Mr PERRETT**—Sorry—governments are what?

**Mr Mortimer**—Not necessarily the leaders in opportunities. If there is a market opportunity then you would expect that someone close to the ground who is actually involved in the industry or the activity would make the observation and put two and two together in the way that has happened in a number of areas. If you think about it, there have been a number of industries or activities that have moved depending on the relative productivity of the land or the availability of water and things like that. Climate change, in many regards, is another variable that needs to be dealt with and farmers will have to adapt in the light of that. I guess what that is saying is that the people out there—the farmers on the ground—will probably sense the opportunity first. Then it is a question of how government can equip and help them to go through that process.

**Mr WINDSOR**—I think one of the things we are picking up in evidence as we have travelled around is that the farming community is a long way in front of the advisory community on some of these climate change issues.

**Mr Mortimer**—In many regards that is not surprising because they are actually there and they are experiencing it. So we acknowledge that. The question then becomes how government can fund and help on issues which are big, complex and more technical and that a farmer cannot necessarily learn or apply on the basis of what he is seeing on his farm. They are the sort of things that Mr Gibbs talks about and that the Climate Change Research Program is doing, looking at what happens across Australia as a whole in relation to the different emission sources and also trying to put controls around these premises in the sense of saying, ‘What happens if the emission is managed this way or that way?’ We pull all that data together and sometimes farmers can do that. They have a yard across the back fence, or they do a bit of googling and have a talk to a researcher. But what we try to do is actually pull that together to higher levels.

**Mr WINDSOR**—I understand what you are saying and where you are coming from, but what we are picking up, and what the department, the CSIRO and a lot of these groups just do not seem to take in, is that there is evidence—soil carbon is a good example but not the only one—of where people are claiming results and the government authorities, rather than going to those places and proving or disproving what these people are claiming, are going off and starting a whole new range of long-term experiments. Is anybody verifying, checking or authenticating some of the claims that are being made about soil carbon?

**CHAIR**—When are these people are going to publish? I guess that is the question.

**Mr Mortimer**—Departments often are not in the publishing process, but I understand what you are saying.

**CHAIR**—I mean the science people.

**Mr Gibbs**—You are correct in saying that there have been numbers of different claims being made about the benefits of different practices. Where we are trying to come through with our

program is not to make a judgment about what is right or wrong about those but basically to say that we need to test it because soil carbon at this point has been held up as a very important tool for productivity reasons and also potentially for the Carbon Pollution Reduction Scheme. So we have to recognise that we do not want to set a point where we are giving farmers false hope. Without pointing the finger at anyone, where claims have been made we have asked all people 'captured' by our programs—that is the best way to say it—and approached those people to have discussions about their results and samples and say, 'How about you look at our samples and bring it together so we have a consistent set?'

**Mr WINDSOR**—Wouldn't it be appropriate in some of those areas—because a lot of private work has been done in some areas—to actually go out and measure the carbon in those soils to verify or disprove it? If those people are snake oil salesmen, we need to know.

**Mr Gibbs**—We have started doing that in Western Australia and we are trying to get agreement to go out and sample in other sites where some claims may have been made which look very significant. That is what we want to do. We do not want to end up with a situation where the science has two communities which are consistently arguing about this.

**Mr WINDSOR**—I was at a function this morning where the deputy director of the Gates Foundation, which is doing a lot of work in poverty, hunger, food production, was lauding the potential benefits of soil carbon as a tradable commodity at some stage in the future with credits et cetera. If those sorts of people are talking about these possible solutions, I think we have to pay some attention to them.

**Mr Gibbs**—I think we are. The government has done more than has been done in the past about trying to answer those claims because of the claims that have been made about whether you can make an income stream from sequestering carbon in soil. In the past farmers have really done this for productivity reasons and for soil health reasons, so in the research program we need to measure and verify these things and get a standard way of measuring. But the government is also working a lot on international rules in this area, because you are going to trade a commodity but it is soil carbon—

**Mr WINDSOR**—We are not talking about trading. We are talking about measuring.

**Mr Gibbs**—I am saying we are doing the measuring.

**Mr WINDSOR**—I know it can be an extension of trading but it does not necessarily have to be. It can ameliorate a problem without being a tradeable commodity.

**Mr Mortimer**—I understand.

**Mr WINDSOR**—We cannot even measure it at this stage.

**Mr PERRETT**—It would be great if you had an international standard of measurement.

**Mr Gibbs**—That is right. The way we measure our soil is consistent with what has been happening internationally. We are also trying new techniques which lower the cost of doing that.

**CHAIR**—Which is probably where the world is going. Are there any programs looking at the footprint of carbon coming from farms if we are not going to go into some great measuring system?

**Mr Gibbs**—If we did not go down the path of an ETS, the research program that we are doing at the moment assists with the measuring and there are really two areas of measurement. There is the research you do on-farm and how you measure that on-farm to proof up that what you are researching is something that is going to work, and that measurement assists in how you may measure emissions across the country or across a region. Then farmers will want to know about their emissions in a farm systems approach. They will want to know about how many cattle they have, what the emissions may be from those cattle, the fertiliser they use and potential soil carbon down the track, so there is a demand for carbon footprinting, if you want to call it that. That demand is coming up internationally as well, and we have seen it come through on the markets.

**CHAIR**—Agriculture will be asked to play its role in some way. That is what I mean. If it is not going to be in an emissions trading scheme it will still be asked to play a role, knowing what will come. I think the other one will be food and health, what we grow as food and where that fits into a health debate which is coming on us too, I think. That will be a global thing as well, so there are policy areas that could vary over the next few years.

**Mr Mortimer**—Yes, it is certainly a rich workplace.

**Mr WINDSOR**—You have done some work on what you believe the do-nothing option is in climate change. In your report you indicated that we will have a reduction in wheat of about 9 per cent. Has the department done any work on the scenario if the globe decides to try and reduce emissions with a global emissions trading scheme on the impact on land use if the food economy is brought into the carbon economy and the renewable fuel economy with all competing for land use? Has there been any modelling done on how all that is going to play out and what impact it will probably have on the price of food and for food to be a viable land-use activity in the developed world?

**CHAIR**—We have had some good discussions about where this is going.

**Mr Mortimer**—I bet you have.

**CHAIR**—We would value your comments.

**Mr Gibbs**—There are two parts to your question. The holy grail in modelling is understanding, if we come up with a global agreement to reduce our emissions and decrease the concentration of CO<sub>2</sub> in the atmosphere, what that translates to in terms of food production. That is a very difficult step to make. Garnaut had some work done on that, and he probably pushed the envelope on how far you can go with it. We could provide you with some work out of the Garnaut report to look into that further. But, in terms of modelling that DAFF has done, we have not done that type of work. You are actually talking about the cost of reducing emissions versus what you are saving through the impacts of climate change, and some of those things are very difficult to measure.

**Mr WINDSOR**—If you apply a market mechanism to those economies, food will start to score negatives. Nitrogen for the protein in grain: negative. Long-transport carbon footprints: negative. Biofuels, lignocellulosic ethanol or something might start to create positives in the carbon economy. As the current CPRS is, it has incentivised tree planting on land that may well have been used for food. If you extrapolate that into a global economy, what does it do to global food security?

**Mr Gibbs**—That is the second part of what modelling work has been done. There has been some work done by ABARE and by Treasury on how agriculture production goes in a CPRS world, and it makes assumptions about when the global agreement would be reached. It shows that agriculture production continues to grow and that the fall from where we would otherwise have been without having a CPRS is not significant. That is the Treasury results. ABARE results are similar to that. We are talking about one per cent below where we would be by 2050. We can provide that information for you.

**Mr WINDSOR**—What do ABARE say about agroforestry?

**Mr Gibbs**—They have done some work for DCC which looked at the price that you would need to switch a productive piece of land to forestry. As to what the price of carbon would have to be, it was over \$100. In terms of where you will see plantations or agroforestry on-farm, if you communicate well with the sector you will see those where there are also good environmental benefits that fit into a productive landscape, hitting the right spots in terms of salinity and shelter for stock. In terms of encroaching on productive land, you would need a very significant carbon price—\$150, that sort of market.

**Mr WINDSOR**—What about a renewable fuel price? You are going to have the carbon economy driving the price of some energy up, so renewable energy may well become more—

**Mr Gibbs**—Renewables will become more demanded because of the carbon price. If you are referring to biofuels, there are issues about using grain for biofuels and the implications of that for food security.

**CHAIR**—Second generation.

**Mr Gibbs**—That is right. I think the endeavour is going to be on second generation. Around the globe people recognise that using grain, corn or sugar to make ethanol is not a long-term solution.

**Mr WINDSOR**—But if you go to second generation you are still taking out land that would have grown food.

**Mr Grant**—Not necessarily, because second generation can use fibrous material from marginal land or land that is—

**Mr WINDSOR**—But if it is economic to do that then it is probably going to be economic to do it from—

**Mr Grant**—No, I think that is right as well. Interestingly enough, if you are looking at land use, the major reason for loss of agricultural land at the moment is urbanisation. We have not done any modelling on that either, but the question is what effect a huge carbon price would have on the way we design cities. Maybe we will have more compact cities and they will be less expensive, so potentially there are some offsets there.

**CHAIR**—Why don't we look at China and India reaching the stage where they cannot feed themselves, at the need to grow food security for both those emerging giants and at where we sit? Have we done any modelling or policy work on what corporations are going to buy the land in Australia to grow food?

**Mr Mortimer**—I am not sure whether ABARE has done any work, but you are quite right—

**Mr Gibbs**—No, they have not.

**CHAIR**—We are getting a long way away.

**Mr Mortimer**—You are quite right. There are certainly evidence and reports of a lot of interest from overseas countries in buying Australian land, which does raise interesting questions about its relative pricing and the position those corporations are taking in looking at the future and thinking about where there are resources that can be brought on fairly readily and that are well positioned to supply these markets that have the infrastructure and the capability. Notwithstanding issues of adaptation et cetera, there is no reason to think that all will necessarily be doom and gloom. It is a complex scenario and a complex set of iterations, but at the end of the day there is relative demand for what the world wants, and if they want food and pay the price then we can do it.

**CHAIR**—The ABARE figures that Mr Gibbs just talked about and the scenarios going to 2030 or whatever—

**Mr Gibbs**—There are two, and the decision to take depends on which one. The scenarios go to 2030 and 2050.

**CHAIR**—So there could be a lot of opportunities to change the way that it is done: land use may change, there may be fixed-wheel controlled traffic farming and a whole range of scenarios could come into play.

**Mr Mortimer**—I suppose that is part of it. We just do not know what form the adaptations will take. It is always an interesting and challenging question. Certainly the adaptation record is there.

**CHAIR**—You mentioned a couple of things to us. It would be useful if Mr Gibbs could pull them and the Garnaut stuff out and get them to our secretariat. Then we will circulate them and have a look at them.

**Mr WINDSOR**—I want to ask about the \$100 land-use charge. CSIRO were talking about one study of a wheat-sheep farmer that was done in South Australia only last week. They are

saying \$20, with a whole range of variables and assumptions. With a carbon price of \$20 a tonne there could be a change of land use from wheat-sheep to trees.

**Mr Gibbs**—I have not looked through the results of the CSIRO report, but I think all the other studies are public and we can make them available to the secretariat.

**Mr WINDSOR**—I think it is the South Australian department of agriculture, but CSIRO referred to it.

**Mr Mortimer**—Critical to that is the nature and position of the land, where it is and what the alternative uses are. If it is less productive land—and I do not want to say that in any pejorative sense—which cannot necessarily produce crops every year or if the variability in the climate means that they get a crop one year in three as opposed to one year in five, as opposed to a guaranteed income stream from forestry, the equation suits those types.

**Mr WINDSOR**—I think the more telling point is that there is one paper has been done, and even your paper is about negatives. I am not having a go at you. You are saying climate change will lead to a 9.63 per cent reduction in wheat. In a different market, it could be the greatest thing that has ever happened if there is a high-priced renewable fuel switchgrass product available with low nitrous oxide and added carbon sequestration benefits. We are looking at the negatives, not necessarily the potential positives. It may not all be downside.

**Mr Mortimer**—I hear what you say, and perhaps we bureaucrats are too conservative. There was scene-setting stuff, but we certainly acknowledge the record of adaptation that is obvious through the Australian farming sector in its history.

**Mr Gibbs**—That is right, yes. I do not think we expect those results. As Mr Mortimer has said, the ability of the sector to adapt to climate variability in the past suggests that you would expect that, with the research and with getting the information out there, that will continue.

**Mr SIDEBOTTOM**—But the ABARE table did say ‘without adaptation or mitigation’. That is the worst case, so it did qualify it.

**CHAIR**—We and Mr Mortimer were talking about that land and how the changes to the amount of water that is available and changing temperatures as a result of climate change and all those things will come into play. We talk about the north. There are a whole lot of scenarios that we are just starting to put into our thinking.

**Mr Mortimer**—I think we will learn as we go along.

**CHAIR**—In 10 years time it could be a different scenario and knowledge base that we are dealing with.

**Mr Mortimer**—Yes. For example, 20 years ago the wheat industry in WA was not there; it was not set up the way it is now. But farmers realised there was an opportunity. While the soil, by some standards, might not be all that flash, they had that very nicely timed and reliable winter rainfall that came across every year, and so they started building the wheat industry there.

**CHAIR**—We went and had a look at the beach where they farm.

**Mr Mortimer**—Exactly. Now they are moving into rotations, parallel planting and this, that and the other and so on.

**CHAIR**—It is interesting stuff.

**Mr Mortimer**—Yes, absolutely. It is a demonstration of the sort of adaptation that can happen, plus the response to (a) information and (b) markets in terms of saying, ‘Okay, we can do that.’ You may have been there and seen some of those things.

**CHAIR**—We did. It was very interesting to see them and also to see the difficulties when it does not rain and all the sand blows up and covers all the fences, which gives them a real problem. They are trying to get a cover on that soil which is there all the time and then plant straight into the soil—into the cover. That is the work that is going on there now. They are also adapting to using cattle or whatever to eat some of that feed and get an income stream, and they are also growing wheat. But the jury is still out on the productivity of it at the moment.

**Mr Mortimer**—That is true enough.

**CHAIR**—So there could be other areas of Australia which we can adapt in the same way, going down other paths. Thank you very much. We really appreciate it.

**Mr Mortimer**—We appreciate that.

**Mr Grant**—Tropical fishing in Tasmania is a possibility!

**Mr Mortimer**—My colleague is being very cheeky here. I do not think we want to go anywhere near that.

**CHAIR**—If it gets too hot for our centre, that will be our problem.

**Mr WINDSOR**—I have one question, just for information. With the carbon ingrained in wheat, in the starch, are you able to find out the proportion of the grain under different quality regimes in terms of protein and whether there is any difference in that? How much of a boatload of wheat is carbon?

**Mr Gibbs**—I know what the answer is in the accounting sense: zero. In terms of a scientific sense, I will get back to you on that.

**Mr WINDSOR**—Could you get back to us, because we are getting mixed numbers on some of that stuff.

**CHAIR**—He is a bit in front of where the debate is, though. When we get a price of carbon, that will be a bit easier, won’t it?

**Mr Gibbs**—The reason it is zero is that people eat the grain and it comes out that way. That takes our soil life cycle approach. There is, of course, carbon in there, but not very much.

**Mr WINDSOR**—No, I mean in the grain itself—in the starch of the grain, not in the farming of it.

**Mr Gibbs**—I do not know.

**Mr Mortimer**—The place where you might get an answer on that is a wheat research bureau in Sydney that I am aware of—I am trying to think of the name of it.

**Mr Gibbs**—DCC may be able to help. I always like to do in my other colleagues!

**Mr WINDSOR**—So you will be able to find out for us?

**Mr Mortimer**—We will do our best.

**CHAIR**—We will make sure you get a transcript of the hearing. Thank you very much.

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

That this committee authorises publication, including publication on the parliamentary database, of the transcript of the evidence given before it at public hearing this day.

**Committee adjourned at 6.14 pm**