HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON ENVIRONMENT, RECREATION AND THE ARTS

Reference: Trading in greenhouse gas emissions

CANBERRA

Monday, 1 June 1998

OFFICIAL HANSARD REPORT

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HOUSE OF REPRESENTATIVES
STANDING COMMITTEE ON THE ENVIRONMENT,
RECREATION AND THE ARTS

Members

Mr Causley (Chair)

Mr Jenkins (Deputy Chair)

Mr Anthony	Miss Jackie Kelly
Mr Billson	Mr Kerr
Mr Robert Brown	Dr Lawrence
Mr Eoin Cameron	Mr McDougall
Mr Entsch	Mr Mossfield
Mr Hockey	Dr Southcott

The committee will inquire into the regulatory arrangements that would need to be put in place to support a market in greenhouse gas emissions including:

mechanisms for measuring, verifying and monitoring emissions and the compliance with contracted arrangements;

mechanisms to integrate emissions trading with the development of carbon sinks (such as timber plantations, gas aquifer reinjection, soil rehabilitation etc), including the science, measurement and security of such arrangements;

the allocation of the right to emit greenhouse gases;

regulatory mechanisms to support a national market and potentially an international market in emissions trading;

possible emission traders, administration and transaction costs;

roles and responsibilities of governments and other stakeholders; and

the impact of emission trading on the environment and industry and the economic and social welfare of the Australian community.

WITNESSES

HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON ENVIRONMENT, RECREATION AND THE ARTS

Trading in greenhouse gas emissions

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Present

Mr Causley (Chair)

Mr Billson	Mr Kerr
Mr Jenkins	Mr McDougall
Miss Jackie Kelly	

Committee met at 9.15 a.m.

Mr Causley took the chair.

CHAIR—I declare open this public hearing by the House of Representatives Standing Committee on Environment, Recreation and the Arts for its inquiry into the regulatory arrangements for trading in greenhouse gas emissions. This inquiry was referred to the committee at the end of October last year by the Minister for the Environment, Senator Hill. Sixty-six written submissions have been made to date and the committee is now about half-way through its program of public hearings.

The inquiry is focusing on arrangements that should be put in place for a domestic emissions trading scheme. As the committee collects information about the best sort of scheme to recommend, it will be looking for mechanisms that will ensure that emissions trading contributes to emissions reduction as equitably, effectively and efficiently as possible. It will be looking for ways of providing maximum certainty at a minimum cost for the environment, the emitters and the creators of sinks.

The committee's proceedings are recognised as proceedings of the parliament and warrant the same respect that proceedings in the House of Representatives demand. Witnesses are protected by parliamentary privilege in respect of the evidence they give before the committee. You will not be asked to take an oath or make an affirmation. However, you are reminded that false evidence given to a parliamentary committee may be regarded as a contempt of the parliament.

[9.16 a.m.]

DOBES, Dr Leo, Research Manager, Bureau of Transport Economics, GPO Box 501, Canberra, Australian Capital Territory 2601

MOTHA, Mr Joe, Project Leader, Bureau of Transport Economics, GPO Box 501, Canberra, Australian Capital Territory 2601

PERRY, Mr Ryan, Researcher, Bureau of Transport Economics, GPO Box 501, Canberra, Australian Capital Territory 2601

CHAIR—Welcome. The committee prefers that all evidence be given in public but should you at any stage wish to give evidence in private, you may ask to do so and the committee will give consideration to your request. We have received a paper from you and have authorised its publication. Do you wish to propose any changes to that paper at this stage?

Dr Dobes—There are no changes to the paper.

CHAIR—Before we begin questions, would you like to make a brief opening statement?

Dr Dobes—Thank you, I would like to very quickly. I know the committee has a lot in front of it; I will not become a talking head. I thought it might be helpful to summarise the main points in the paper and add some further thoughts which we have had. The first point is that there is already a very large literature on tradeable permits and everyone tends to repeat what is in the textbooks, but there is very little empirical information. Last Friday at the ANU a very interesting seminar was given by Lata Gungadharan who is a specialist in the RECLAIM project in Los Angeles. This is a project which tries to reduce NO_x and SO_x emissions in the South California basin.

Dr Gungadharan made the very interesting point that the RECLAIM authorities there collect price information and trading information but, because of the way it is set up, about three-quarters of the trades—the actual exchanges of permits that take place—are not recorded. So when one looks at the empirical information and tries to draw conclusions for greenhouse emissions, one has to be very careful because there is not much information out there. Similar stories are coming out from people who are involved with the SO_2 program elsewhere in the United States.

The BTE's objective was really to look at the practical issues. Therefore, I do not want to go through any of the theory, but I would like to draw the committee's attention to the transport sector. It has some distinguishing characteristics which need to be taken into account. One is the obvious one that we are talking about, that is, mobile emissions which are very difficult to monitor.

There are five transport modes that one could look at and one can also break most of those down into passenger or freight—so it is not just one homogenous good that one can talk about in transport. Carbon dioxide is about 85 per cent of all those emissions; but the Kyoto Protocol does not cover some of the others, like NO_x and carbon monoxide—so distortions are very likely in the transport sector under the current approach.

International transport emissions are not currently attributed to countries so it is possible to think of a tradable permits regime which will create distortions, such as people travelling from Melbourne to Darwin via Bali simply to have cheaper fuel for the flight. Then there is the question of allocation. One could allocate permits to individuals which would involve high transaction costs, or to fuel sellers which would mean that the price signals might be lost to some extent.

One thought I had over the weekend, as I was thinking through this again, was about the alternatives for initial allocation of permits—which is really the crux of the issue here. Apart from an auction system, where the government, or whoever sells the permits, would extract all of the economic rent, the alternative that is usually touted is a grandfathering system where people obtain the permits on the basis of past usage, but there is no talk, so far, of taxation. In a sense, that would be inequitable because particularly high emitters would receive free allocations of a resource which is an environmental good. A resource rent tax is something one might think about. Someone could either think about capital gains taxes—in other words, getting a bit of paper which appreciates overnight in value as a property right comes in—or a resource rent tax. It is not clear to me which one is the appropriate one, but that is something you may wish to consider.

The issue of sinks is probably a very important emerging issue to make sure that one gets an integrated market in tradable permits. If that is not set up correctly, then the market will be very inefficient. There are two major problems there. One is the global warming potential problem—and we can talk about that if that is the committee's wish. The other is that the period of 2008 to 2012, which is the commitment period under Kyoto, is a very limited window to generate a sink. If one thinks of trees, the planting of trees to maximise carbon sequestration in that period would be very difficult.

Finally, I would like to draw the committee's attention to the fact that a number of agencies in the government and outside are collaborating to produce a book on tradable permits in preparation for the meeting in Buenos Aires. The concept of the book would be to emphasise all the practical issues in terms of implementation, both internationally and domestically—and almost to be used as a background brief for the delegation going to Buenos Aires. So the agencies involved are the BTE, ABARE, the Productivity Commission, Treasury and a few others—all of us are collaborating by writing different chapters. Thank you for the opportunity to address the committee.

CHAIR—Thank you. Do you believe that we can achieve the levels of emissions that we have been committed to at Kyoto if we do not bring in some sort of trading

scheme?

Dr Dobes—I cannot give you a specific answer because, obviously, we do not have that sort of knowledge, but in terms of being able to achieve anything—

CHAIR—Which do you favour though? I suppose it is the carrot and the stick. The trading scheme is seen to be the carrot and, I suppose, government regulation is seen to be the stick. If you had an assessment to make on whether we could actually reach those goals that we have set ourselves and that the world has given Australia at the present time—which I suppose could be considered to be generous—which way do you think we could achieve it?

Dr Dobes—One could achieve it in both ways because tradable permits are in fact a regulatory instrument which makes use of the price mechanism to achieve its ends, as you know. It is just that tradable permits are a more efficient way of doing it; in other words, the total cost to the community is minimised. So in the sense that a tradable permit would regulate the amount of emissions or fuel usage or whatever, it is identical to a strict regulatory instrument except that it allows people to chose the least cost way of reducing their emissions. The community would suffer less under the tradable permits system than under a strict regulatory system which made everyone reduce emissions by the same amount.

CHAIR—We have certainly had some discussion about how the permits should be issued—whether they should be auctioned, whether they should be given to emitters on the rate either as now or at 1990 levels, or whether there should be a mix of issuing some permits; auctioning some and holding some for new entrants. Where do you think that these permits should go? In the instance of the transport industry, should the permit be on the oilwell, the refiner or the emitter?

Dr Dobes—The most direct way is obviously on the emitter. This is where we get that awful trade-off in the transport sector, which is a bit different. As you know, most schemes have only a few players in them—mainly stationary sources—and that is where the signal should really come from. That is where the trade should be occurring, so that the incentive is there to reduce emissions. But, in a sense, even if tradable permits were issued to refiners or oil producers, price signals would ultimately come down to the consumer, to the individual motorist, so it does not really matter all that much from an economic efficiency point of view, except that one would then ask the question: if a price signal is being given to individual motorists, why not use a carbon tax instead? That is the equivalent. It really depends on which way one wants to go.

It also raises the question as to why every sector has to be the same. It would be possible to have a tradable permit scheme within the economy, but with some sectors—like the transport sector—perhaps being based on a carbon tax where that tax would be

tied to the price established elsewhere in the economy. That would also involve costs, obviously. To be honest, we really do not know what the answer is. We have done no empirical analysis because there is just no information to go on at the moment.

CHAIR—This will certainly have an effect as far as countries around the world are concerned, because once you start to talk about where that permit should finally rest, you get involved in trading, the balance of trade and those types of issues. I do not think that countries would divorce that from their responsibilities under greenhouse.

Dr Dobes—That is a very good point. I am really not sure exactly what is envisaged. In fact, we have a chicken and egg situation at the moment where we are all trying to guess what the negotiators may come up with and their not being sure what the problems are in their being forced to negotiate some sort of scheme internationally.

I would guess that there is going to be some tension between setting a target for each country—the way the Kyoto Protocol is set up at the moment—and countries not wishing to see other countries avoid their responsibilities, so to speak, by trading rather than reducing their own emissions. But that is the same problem that one gets in any debate, particularly between economists and some environmentalists. Again, I do not really know what the answer to that is.

CHAIR—You mentioned California, and I dare say we will come back to smog—a lot of our cities seem to suffer a fair bit from that. There was an effort some years ago to reduce the lead in fuel, not so much because of smog but because of lead poisoning. Do you think that the way that was set up, the incentives that were involved there, really produced a genuine result?

Dr Dobes—If one takes the result as being to reduce the amount of leaded fuel being used, the answer is, yes, it has had an effect. It was not a very well-targeted scheme, though, as people pointed out at the time, in the sense that in some areas lead concentrations were much higher, in the cities particularly. In country areas, for example, that scheme did not really make all that much sense from an economic point of view or an equity point of view. So I do not think it was a very well set-up scheme. But it was not a tradable permit scheme, as you know, it was very much a price mechanism which was used.

But there are other instances in Australia at the moment; I do not think we need to limit ourselves to overseas experience. I think in New South Wales there have been several tradable permit schemes operating—the New South Wales EPA has been active in that area. NO_x emissions are now being targeted where industry and the transport industry can exchange NO_x tradable permits or, at least, that is what is foreseen. I am not sure whether the scheme is in operation yet. For example, industry would be allowed to buy old vehicles which emit high levels of NO_x as a way of meeting their own obligations. So, in a sense, that is almost like a tradable permit scheme.

CHAIR—I suppose what I am saying is that, from memory, the lead free fuel has been available in New South Wales with some incentive for about 15 years.

Dr Dobes—That could be. I am not sure.

CHAIR—And yet there are still large numbers of vehicles on the road that are run on lead, even in the city, aren't there?

Dr Dobes—Yes, there are, but they are a very small proportion. There are certainly fewer leaded fuel vehicles these days than the unleaded fuel vehicles.

CHAIR—The new ones are all lead free. I think.

Dr Dobes—Since about 1986.

CHAIR—Where does your industry actually sit on the scale of emitters? We have heard that the generating industry is probably the largest, but where does the transport industry sit?

Dr Dobes—The transport industry is probably responsible for somewhere between 12 and 14 per cent of total greenhouse emissions, if one takes sinks into account in Australia. If one looks only at energy sources—in other words, emissions from energy sources from fossil fuels—the percentage is much higher, about 25 per cent. These are rough estimates, all based on average fuel efficiencies of vehicles and average industry emissions and so on, but they are usually accepted within the industry and the research environment.

CHAIR—And do you have a split-up of what that might be from, say, private vehicles and transport that actually affects export?

Dr Dobes—We do not have that particular split. That would be very difficult to work out, particularly because of intermediate usage. In other words, if one were to look at all export goods, it is not just the final transport from the warehouse to the wharf that one would need to look at but also all that intermediate input, including imports as they came into the country if they were used for further production. So we do not have those figures and I think they would be very difficult to generate. But if the committee had need of those figures we could do our best to get them for you.

CHAIR—And what about sea transport? Are you responsible for that?

Dr Dobes—Along the coast, the answer is yes. Under current international greenhouse agreements but, as I mentioned in my opening statement, international transport—in other words, beyond national limits—is not at this stage attributed to

countries. So we are not responsible.

CHAIR—What are we going to do about that?

Dr Dobes—That is, I think, a matter for international negotiation. It is something which countries would have to agree on, and that is a very difficult area to agree on, because obviously countries that have a lot of transit traffic do not want those emissions attributed to them and countries that use a lot of long distance transport like Australia would like to minimise the amount attributed to them as well. So Bangkok, for example, would not like to see bunker fuel uplifted at Bangkok being attributed to it. I think the Germans and Czechs have similar problems with trucks passing through.

Mr BILLSON—And pipelines.

Dr Dobes—And pipelines.

Mr BILLSON—I am interested in talking more about the issue of where some schemes land. In the Prime Minister's announcement there were some specific measures targeting the transport sector. Do you have a feel for what sort of contribution those measures will make to our effort towards the plus-eight per cent?

Dr Dobes—Some figures have been generated, but I am not familiar enough with them to give you an honest response to this. My understanding is that they are expected to produce some effect but it is not to be a dramatic effect. I think that statement was put together before the negotiations were complete. So I am not sure that it was put together with that aim in mind. We do have our own estimates of various sorts of measures, and they are published in this 1994 report by the BTE. There are 16 measures looked at there. When we added those up, though, there were some quite dramatic ones—including introducing road user charging on cities and so on. So we think that most of those 16 are the most effective ones that could be put in. The reduction that would be achieved would be about five per cent, I think, in the transport area. If you multiply that roughly by 10 per cent for transport as a percentage of the economy as a whole, that gets you down to about one per cent reduction over some 20-year period. So it is not very much.

Mr BILLSON—And that assumes a growth in activity offset by improved emissions outcomes?

Dr Dobes—Yes, indeed, it does.

Mr BILLSON—I get a sense from what you are saying that you would accept an argument that maybe a tradable framework will go some of the way but that a suite of measures would perhaps complement a tradable framework necessary to bring in, say, the transport sector—we have talked about primary sector, rural production and those sorts of things as well. Is that your view?

Dr Dobes—Yes, you are right. In a sense, the theory of tradable permits almost assumes that you are starting from an equitable situation of some sort—whether you are imposing a carbon tax or a tradable permit scheme—and that is not the case in the transport sector at the moment where a lot of activity takes place without appropriate charges or taxes being put in place.

Mr BILLSON—A view has been put that in the transport sector there might be an aggregate permit allocated to state registration bodies or something similar within which they would then address questions of price signals, PMU issues and fuel efficiency issues. Where there are emissions over and above the aggregate volume that they have been allocated, maybe the task would rest with that state or national base agency to acquire the additional permit capacity and then send those pricing signals back to the motorists through whatever measures they see best support their aims. Is that an idea that you have done some work on?

Dr Dobes—We have done no work on that. That is obviously a doable, workable sort of scheme, but it raises the question again: if price signals are going to be sent down to ultimate emitters, why not use the easy option, which is a carbon tax or some sort of tax measure straight off?

Mr BILLSON—I guess the point is that they might be an easy option for that sector. I pick up and have some sympathy with the point you made in your paper that one size might not necessarily fit all, yet there is a framework that enables a tradable permit arrangement to be fairly comprehensive, yet recognises that there are subset policy issues within various sectors that you chase in another way.

Dr Dobes—Yes, I think we are thinking along the same lines. An alternative to setting up a bureaucracy to these trades would simply be to have fuel sellers or fuel wholesalers take part in a tradable permit scheme which was economy wide. I think that looks, from this distance at least, to be administratively simpler—

Mr BILLSON—They would argue though that they do not exercise the choice about how the fuel is used; they do not exercise the judgments about what technology the fuel is being applied to.

Dr Dobes—Yes, and they are right.

Mr BILLSON—The international picture interests me greatly. I can see, particularly in non-Annex 1 countries, where if we go down a tradable framework there will be an instant comparative advantage generated for those countries because the cost, however it is delivered, of working within the Kyoto Protocol is not borne by those countries. Have you considered a greenhouse compliance treatment of imported fuel or products that use fuel to bring it into the Kyoto compliant world, to equalise that trading arrangement?

CHAIR—Is that called a 'tariff'?

Mr BILLSON—We have not used that word, and it would not be a word that I would use, but—

Dr Dobes—That is an interesting notion. I assume that what you mean there is that countries that have produced their oil in some greenhouse friendly way would have free entry into the Australian market but others would somehow be charged more, but I am not sure how we could set this up.

Mr BILLSON—For example, the refining process generates emissions. If you are refining product in Australia you have to be mindful of our Kyoto obligations. If you are refining product in a non-Annex 1 country, firstly, you do not have to worry about it; secondly, you might be able to use cheaper technology because of it; and, thirdly, you would have comparative advantage on price.

Dr Dobes—This is where we start to get into all sorts of problems looking at whether one attributes emissions to consumers or producers. I am really not sure whether that has been completely worked through at the moment. The approach seems to be that producers are the ones that are targeted—for example, the Australian aluminium industry and so on—and in that sense it would be consistent to do what you are suggesting, but unless they are part of the Kyoto Protocol or the agreement I do not think that one could really do much because there are other international agreements on trade which may affect anything that can be done in the environmental area, and that is yet another area which has not really been looked at properly.

Mr BILLSON—We have trouble with nuclear test ban treaties and chemical weapons. You would think there would be a consensus that certain responsibilities are carried with those and we cannot enforce those. On the sequestration question—and I accept your point that the science is not very precise on some of those issues—are you sympathetic to an argument that says that sequestration measures would be an offset against an emission target for an emitter rather than something that creates a permanent capacity in its own right and can be traded in its own right?

Dr Dobes—Yes, I think either of those two could be done. One should be talking about net emissions because that, presumably, is what contributes to global warming or cooling, whichever way it goes. Definitely, it should be an offset to emissions. That is at least an arguable case that one could put.

Mr BILLSON—The onus then rests on the emitter to verify some of the claims rather than a farmer on the Mornington Peninsula who might replace his grape crop with sequestration timbers. I have a number of other questions; I will come back to them.

Mr McDOUGALL—I would like to look further at the question of non-annexure

1 countries. From information we are gathering—my figures may be wrong—we have three industries: the power industry, the aluminium industry and transport. Around 80 per cent of the emitters of greenhouse gases emit—

Mr Motha—Concrete is in there too, I think.

Mr McDOUGALL—Concrete might be added on top of it. There are not many industry players in this, are there? There are a few big ones and a lot of little ones—the old 80:20 rule seems to work pretty well just about anywhere you go. How do you set up a trading scheme on a national basis that works internationally and enhances our position when companies which are the emitters can trade internationally within their company, at a disadvantage to us, to be able to get advantages in non-annexure 1 countries?

Dr Dobes—That is a very good question. First of all, let me say that I think the agriculture sector should be included in what you have just said in terms of the emitters. I do not really know how to answer that question. I would have said that transparency is probably the major thing that has to be looked at. That is a problem with current tradable permit schemes where the regulatory authorities or the authorities in charge of the scheme do not keep records of all the trades that are taking place. In this case too, if one allowed multinational companies or whoever to do with tradable permits what they do at the moment to minimise their taxation burden, then the only way of making sure that we know what is happening is to have transparency; in other words, it is like transfer pricing or anything else. That is probably the only answer I can give you without really knowing all of the details of how a scheme would be set up.

Mr McDOUGALL—Should permits be traded within industries or on the open market?

Dr Dobes—I think both.

Mr McDOUGALL—But not restricted to one or the other?

Dr Dobes—It certainly would not be efficient to restrict them to one or the other. The question then becomes whether the open market should know what is happening within the industries—in other words, have the price information and the quantity traded information—or whether that should be allowed to be kept to those companies themselves. On the open market, people do not always divulge their trading information. I do not think there is any need to make this compulsory, but it would certainly help to set the market or to inform the market and reduce transactions costs, or at least search costs, for finding that information by the market itself. That is probably something which, at least in the early stages of a tradable permits scheme, would be a useful function for a regulatory authority.

Mr McDOUGALL—How do you set performance targets for reduction in emissions if you have a really free and open permit market?

Dr Dobes—Do you mean for individual companies?

Mr McDOUGALL—Yes.

Dr Dobes—I do not think you would. If you had a permit market, you would not do that. For the whole country you would set a reduction level and then you would issue permits to match that level. Then you would let the market itself work it out.

Mr McDOUGALL—But in your paper you suggested in relation to sinks that you should put binding contracts onto plantation owners for the harvesting of those trees and the types of trees that they plant. I can see why you are saying it, but if you are going to bind up one area of it, why can't you bind up the other area?

Dr Dobes—That would only be binding someone contractually if they were claiming a credit. If they were claiming credit for a sink there would need to be some method of ensuring that they stuck to harvesting the trees at, say, 30 years of age rather than 25 years of age; that is the only commitment there that I was looking at. I cannot remember the exact context in which that was said but it would not be any more than that.

Mr McDOUGALL—Finally on this area, where do we put the limit on the plantation of sinks? It seems that, from the industry perspective—particularly these big emitters—everybody just wants to plant trees. They see that as the simplest, easiest way; that, really, it might be a bit too costly to get into more technology to try to reduce emissions, but gee, it's easy to plant trees. We might not even get our outcome by that; if we are still going to keep emitting and we are going to plant some trees, we are not improving our overall performance, are we?

Dr Dobes—Once again, I would leave that to the market. There will come a stage when land becomes scarce and so on and the cost of planting trees will go up dramatically compared to using some other methodology for actually reducing emissions. For a government to take that decision in advance, I think, would be wrong and it would be quite inefficient to take that approach. It would defeat the whole purpose of tradable permits—which is really to get an efficient market.

CHAIR—Can I go back to this annexure 1 and non-annexure 1 countries and the ones that are outside and whether it is going to affect the industry within annexure 1 countries? Isn't the theory behind this that, in fact, if annexure 1 countries are restricted in their emissions and probably reduced over a period of time in their emissions, the driving force behind this would be if they could gain credits—if they were car manufacturers or if they were electricity generators—then they would put better efficiency into those areas in non-annexure 1 countries? Do you think that is a fair and reasonable theory?

Dr Dobes—I was not at Kyoto, so I do not really know the underlying reasons for the agreement as it is, but I do not think it was foreseen that way. I think, very specifical-

ly, the clean development mechanism was put in where something was actually specifically done—where a project was carried out specifically in another country for that country and, then, if there were emission benefits from that, they could be claimed as benefits; in other words—reductions. I do not think a general technology which is introduced can be claimed that way—at least under the current agreement.

CHAIR—I think we have had evidence to suggest that generation of electricity in non-annexure 1 countries was probably about 40 per cent efficient and in Australia it is about 60 per cent efficient. There are opportunities there to reduce the emissions in those countries if developed countries were using their technology in those areas.

Dr Dobes—Yes. That is probably true, but that would require an actual mechanism—a project—in that country to be implemented. That is foreseen under the Kyoto mechanism as a clean development mechanism and that could be claimed.

CHAIR—I want to make another point which I do not think has been raised before. You mentioned agriculture should be measured in this, and we recognise that, because the finger is pointed at Australia; but, what about that other plague on the surface of the earth called humans? What about the emissions they put out in some of these very populated countries?

Dr Dobes—Yes. In a sense though, one would have to be very careful as to how one did that. But the answer is actually yes, that should be counted.

CHAIR—It is in Australia's interests to raise it.

Dr Dobes—It is in Australia's interests to raise that. It is also in Australia's interests, I guess, to look at the migration issues. Australia being a country of net immigration, one could argue that if tradable permit rights are grandfathered in other countries then migrants, for example, or even tourists on a temporary basis, should bring those grandfathered rights with them when they visit. If a tourist is using transport in Australia, one might argue that they should be using up their tradable permits which they have, say, in another country rather than ours. But there are counter arguments to that, obviously.

Mr BILLSON—In terms of the initial allocation and avoiding windfall gains and losses—if we grandfathered the initial allocation at 1990 emissions but discounted the value of them to bring us into line with the accounting period targets, is that something that you would have some support for, as a way of bringing about positive change—recognising positive action early in the process and creating something that can be traded or let out onto the market, either through an auction process—

Dr Dobes—Let me see if I understand the question. We are discounting them for the time value of money—

Mr BILLSON—No, if you and I were running a business, for instance, and we have 10 million tonnes 1990 but to get down to our outcome of plus-eight in a macro sense we have to bring our effort down to 8½, for instance. So the initial allocation would be 10 and it would step down to 8½ in the accounting period. If we did not deliver, we would have to acquire more permits. Or if we outperformed that discounting target down to the plus-eight, we could trade the surplus.

Dr Dobes—That is obviously envisaged under the tradable permits as a mechanism, but the problem is this commitment period where one cannot do it before the beginning of the commitment period because it would not count if one went too far down below—

Mr BILLSON—One could.

Dr Dobes—One could and, theoretically, I would argue that one should, because it makes sense both environmentally or ecologically and in terms of the economics or the efficiency of it.

Mr BILLSON—The point being that you do not want a global transformation on 15 December 2007; you would want people to take action with as little dislocation as possible to the industries they are involved in now, I would have thought.

Dr Dobes—Yes, certainly.

Mr BILLSON—If we go to a tradables framework, how open should it be? Should an environmental George Soros be able to acquire tradable permits around the world and go along on them? Should environment groups be able to accumulate them to bring about a faster rate of change in global emissions, or do you subscribe to the view that you should be a registered participant in the trading framework and therefore have an artificial barrier to enter the tradable market?

Dr Dobes—When you put the question like that, I think the answer is no. I think it should be an open market. Indeed, I think that environmental groups already buy up permits in America. They do it for effect, obviously. They make a statement that way, and they do have some marginal influence.

Mr BILLSON—How do we deal with the LPG problem where we cannot even get a standard for gas, we cannot get a proportion of butane and whatever in LPG in a consistent way that at least lets people develop technology that is efficient? How are we going to handle that when we cannot even get consistency in the fuel itself?

Dr Dobes—That I do not know, but it is no worse than the problem at the moment of even making estimates of how much people use in terms of fuel, because we have very rough averaging figures. If one were allocating tradable permits, say, on the basis of

individual motorists, all that one can do is use a very rough average which would advantage some and disadvantage others—and the same thing with the butane. I guess there would be a bit of interaction there as well where, once permit systems came in, people would also start changing the mix of what they were doing to maximise their own profits and so on.

Mr BILLSON—In terms of the clean development mechanism in some of those non-Annex 1 relationships, do you think that buying up an existing rainforest in Costa Rica is virtuous enough to generate some greenhouse permit credits?

Dr Dobes—Buying up an existing greenhouse forest which is in an—

Mr BILLSON—Does that buying up in a non-Annex 1 country have some virtue that should create permanent credits in an Annex 1 country?

Dr Dobes—I think it does have virtue in the sense that if it were going to be logged tomorrow and as an alternative it was bought up and maintained the answer is yes. But it brings in the moral problem of—

Mr BILLSON—No net effect.

Dr Dobes—Yes, people just claiming they would have logged it anyway and therefore there is no net effect. But if it was quite certain that it would have been logged there is a net effect.

Mr BILLSON—But should those mechanisms allow non-Annex 1 countries to opt into the Kyoto framework?

Dr Dobes—Yes.

Mr BILLSON—Picking up the earlier point about trade implications, if there were signals that said, 'We'd all like to make a contribution,' should opting in be part of the framework?

Dr Dobes—Most definitely, although I cannot quite see what the advantage would be to some countries in doing that.

Mr BILLSON—Without doing what we talked about earlier, probably not much.

Mr KERR—I have two questions. The first is about the target of two per cent renewables which has been set by the government. I understand there is a discussion paper, currently for consultation with the affected industries, which leaves open a lot of questions about what will actually be measured in terms of what constitutes a 'renewable'. Do you have a view in relation to that in terms of meeting what are now agreed as our

greenhouse targets for the year 2005? I am concerned that, if some of the choices made include as renewables a whole range of things which ordinarily would have been thought not to be so, the opportunity of that to play a significant part as an abatement measure would seem to be lost.

Dr Dobes—I think I would like to try to avoid this question because I am not familiar with the paper. I do not really know about those issues. I could give you an answer off the top of my head, but I really would be skating on thin ice.

CHAIR—You can come back to us if you want to.

Dr Dobes—I would be happy to take that one on notice, perhaps have a look at the paper itself and then provide an answer.

Mr KERR—Would you do that for us?

Dr Dobes—Yes.

Mr KERR—The other point is in terms of arguments of economic efficiency. I have heard argument that even those mandated quantitative targets would be better addressed by some form of trading regime. Has that argument been advanced to you and, if so, do you find it an attractive one?

Dr Dobes—I am sorry. Would you mind repeating the beginning of that question? Which tradable permit scheme are we talking about?

Mr KERR—A domestic scheme.

Dr Dobes—I certainly find that attractive. I do not know that one can very definitively give an answer in specific sectors because transactions costs play a very large part in this. So the theoretical argument is always there. A tradable permit scheme is good, but it makes a lot of assumptions, just like any argument based on assumptions of perfect competition and so on. Unless one knows what the transactions costs are and what the alternatives are, it is very difficult to give an answer.

In the transport sector, where one has a large number of players, one would expect large transactions costs. I think that there it becomes more marginal, more debatable. But, in principle, tradable permit schemes are something which I think we would support as an efficient mechanism.

Mr KERR—You mentioned the possibility of some offsets in various areas about population transfers and the like. To the best of my knowledge, that has not been an argument that has been advanced by any country internationally, let alone ours. In relation to the theoretical point you raised about tourism, how could one cast such an argument,

given that, presumably, we encourage tourism as a net economic advantage to Australia? The idea that countries that send out their people to spend their money in Australia should, in a sense, subsidise Australian tourism even further seems a difficult argument to construct. Given that Australia also exports hundreds of thousands, if not millions, of high-spending tourists overseas, I am not certain that it is an argument we ought to be terribly anxious to identify.

Dr Dobes—That is a very good point. In fact, I could raise the counter-argument, as we said in the paper, where the transactions costs of charging or making them use these permits may actually outweigh all the benefits, so one would have to do the sums on that. But I think, in principle, it does apply in the sense that, if we are trying to make sure there are no economic distortions in production, tourists should be using their tradable permits if they are visiting another country. I think an argument could be made there. For example, just as tradable permits constrain production activity in any other part of the economy, tourism is affected by them too if they are applied equally in all sectors. I do not see why there should be an exception for one sector.

Mr KERR—I wonder about the economic logic of that. Presumably, you would bring your tourist, who has benefits—in other words, you do not attract your tourist without a consequence. Tourism brings economic benefits, and it also has certain kinds of consequences—urban and planning consequences, infrastructure costs, coastal impacts, and a whole range of other things. All of these things require us as a receiving nation to plan them and to ensure that we put in place mechanisms that mean we get a net benefit and, of course, I think we do.

I am wondering about the argument. In that sense, the tourist is not anything more than a productive element in a cycle of economic activity. Why would you be able to argue, in that particular cycle, that one particular cost be netted out and attributed to the sending country? It seems quite odd as an economic piece of analysis.

Dr Dobes—If one assumes that rights are given to countries, which is the way the current arrangements are—in other words, rights to emit are given to specific countries and, therefore, to the population of that country—then I think there is an arguable case to be made. We would not have increased our emissions—say tourists travelling between Melbourne and Sydney—if those tourists had not been here. We could take that into account in our own productive activity and attribute it to Australia only, but I think that one could make an equal argument that the tourists should bring something like that with them. I am really not sure that I can see your point there. I would say that one could argue either way on this. It was an issue that we were raising just to draw attention to the fact that nobody had taken it into account. I think one could argue either way.

Mr JENKINS—I think that all this example serves to show is that when we try to interrelate the economic and environmental accounting side of these that we can come into what appear to be apparent conflicts. Whilst I cannot really envisage the individual permit

road, I take the point about international transport and trying to attribute who would be responsible. I think this paper has clearly put that before us today. There would have to be some mechanism whereby any domestic trading system would interconnect with the international. I think these are the issues: how do we attribute the responsibility for the emissions at which level? That gets us back to where we have been, it seems, at every hearing. I think the paper was a good attempt at trying to jog our minds about different ways of looking at it.

I would like to ask a question which does not necessarily arise from those comments. Your comments about the sinks and in a way locking up was a basis for how you could measure the sequestration of any forest or plantation and that there needs to be an over time averaging of that figure. Is that the basis of your suggestion that there be a locked-in time period for the credit? Is it simply the difficulty of measurement or is it for some other reason?

Dr Dobes—I think it is a conceptual problem as much as an enforcement problem, with everything wrapped up in one. We did not propose an exact fixed time period, but in terms of sequestration plus decay in average over that time period, that seemed to have the attraction of being easy accounting because one could estimate it very easily at any point in time if one knew what the growth rate of a tree was and what the decay function was of that tree. It was also easy to enforce if it was locked in using a contract of some sort and knowing what the end use was. I guess that is about as far as I would go. This has not been completely thought through, but in terms of accounting and enforcement that is probably the easiest way of doing it.

Mr JENKINS—Can you envisage a system where the carbon credit itself would have a value over and above the value of the timber, over and above the value of the land on which the forest—

Dr Dobes—Certainly. In fact the way it would work is that the timber would simply be sold as timber at whatever price—probably at a lower price than today if everyone was planting—but there is the question of the associated carbon credit with that, and that would have a separate price as that is a separate commodity. How it would actually work out, I do not know, because there are secondary effects—for example, if timber replaces steel that is not taken into account because there is some opportunity benefit there for reducing carbon emissions as well. It is not just the carbon locked up in the tree that you should be getting credit for; it is what it replaces, which is steel or cement or whatever else it is replacing. I do not think that could be easily included in a scheme like that.

CHAIR—Unfortunately, we will have to leave it there. We could probably go on with more discussions, but we are running out of time. Thank you for your very interesting evidence. We may come back to you at a later date with further questions, if that is acceptable.

Dr Dobes—Thank you.

[10.06 a.m.]

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WEIR, Dr Anthony Donald, Manager, Domestic Greenhouse Response Branch, Department of Primary Industries and Energy, Edmund Barton Building, Barton, Australian Capital Territory

CHAIR—Welcome. We note we have had a request that you would like to give evidence together with the Department of Industry, Science and Tourism and also the Australian Greenhouse Office. We accept that and have agreed that there can be a common hearing, but there are some issues we can discuss this morning. Thank you for attending. We have received a submission from you and have authorised its publication. Are there any changes you wish to make to that submission at this stage?

Prof. Barlow—No.

CHAIR—Would you like to make an initial statement to the committee?

Prof. Barlow—Yes, thank you. Before I begin, I might preface my remarks by saying that I have to leave on the dot of 11 o'clock because I am on my way to Bonn for the next greenhouse negotiations. My colleagues will be able to continue. Please do not feel any disrespect towards your committee.

This submission from the Bureau or Resource Sciences is in addition to the Department of Primary Industries and Energy. We are glad to appear at this separate time even though that department will appear with DIST and the Greenhouse Office. What we have emphasised in this submission and I wish to slightly embellish on at present are the following issues. Firstly, particularly within land resources and indeed the fugitive emissions area we see emissions trading as an opportunity for—that is, quite compatible with—other environmental agenda of the government.

Secondly, there is a problem which needs to be addressed essentially in terms of the framework for measurement, the measurement and the verification and auditing of this trading activity. This, of course, will impact quite strongly on the transaction costs of such a thing. Thirdly, we wish to talk a little about some of the technical risks we see in such a trading system and, finally, BRS is planning a joint seminar as part of the Australia-Japanese science agreement to discuss these very questions in terms of measurement verification and, undoubtedly, we will come to trading in sinks.

I will return now to the new commodity. Kyoto was essentially a trade agreement that established a new commodity, and that commodity is carbon. Within BRS we see—whether it be emissions or sequestration—that there should be a common unit and therefore it would be intertradable. We feel that in order to do that there are some problems that have to be addressed. The first is—we noticed from our predecessors at this committee—that the level of the inventory in Australia is in fact agriculture, forestry and land use change actually making up about 35 per cent—it was 43 per cent in the original inventory but now it is down to about 35 per cent—so it is a considerable part of the Australian inventory.

Furthermore, this amount of our inventory makes us quite unique in Annex 1 nations. Quite obviously, our representations in Kyoto were strongly along those lines. We feel that quite a lot of further work needs to be done, because as it currently stands in the Kyoto Protocol there are only two parts of what you might call the framework convention and climate change inventory that are actually going to be part of the Kyoto treaty at the current time and are therefore tradable. Therefore, these are, at this point: plantation forestry or forestry initiated after 1990—afforestation, reafforestation, de-afforestation activities post-1990—and land use change, which is essentially land clearing.

Dr Weir—That is within the land use change and forestry sector.

Prof. Barlow—That is within the land use change and forestry sector. However, in article 3.4 of the Kyoto agreement there is the opportunity to negotiate further sink activity for sequestration of carbon, provided, firstly, that it can be adequately verified and adequately measured and, secondly, that the conference of parties agrees to that before the first meeting of parties, which occurs of course after the treaty is ratified. So we expect basically that the window of opportunity is about two to four years away—perhaps three years or maybe a little longer. Tony is a bit more conversant with that than I but it is all a bit of a clairvoyant activity.

So I guess what we are saying to you is that within this area there is a need to move fairly smartly in the verification and measurement of the sequestration activities, if we are able to argue in the international forum which we need to have for them to be included in the protocol or the final treaty. Finally, in order for that to happen, we also need to be sure within the government that we are arguing for something that is an advantage to us. That is the other question in some of the sequestration activities.

There are also questions of definition which we will come to later. And we will give you a diagram we have. The questions of how you quantify a plantation forest has been spoken about at great length, and we believe that with the technology now available it really is not as difficult as people are putting forward. We just wanted to suggest to you now the following type of scheme that we feel would be workable. We have forest models in conjunction with CSIRO within BRS at present that are able to predict, if you like, the carbon sequestration potential of any site and of the major species in Australia, but it would be possible to calibrate it for other species. So we know *Pinus radiata*, we know *Eucalyptus globulus*, we probably have a little bit about obliqua and grandis, if we want. So we believe we could give, in the first instance, a carbon sequestration down to not within 10 per cent but probably at 20 per cent.

The next move, we believe, is the need to verify. We all know that it takes probably four to five years before you get canopy closure with a plantation. We can pick that up from the air with satellite imagery at about four years—certainly at five years. We will give you an indication of some of our technology but this is essentially remote sensing satellite technology where you see plantations. So we could verify the existence of plantations that were claimed at about four to five years—certainly by five but maybe four if they were fast growing plantations.

I think the next point in the process we would say would be that the vendor, whoever is the seller of this carbon, probably has the responsibility to verify what they have got themselves, so there is an on-ground mensuration activity that I believe has to happen, but we believe that we—or some other body using our technology—could conduct an auditing function on these verified credits by running it through the model again, in the same way as the Taxation Office does at present if someone is claiming credits in some particular area. We have given you your electorate, but there are not too many plantations there, and so we have given you Mt Barker as well because there is quite a lot of plantation activity in Western Australia around Mt Barker.

Unfortunately, there are two red colours on the map in the Mt Barker area, but if you look at that you can see on the legend that one of the more pinky types of red illustrates the new plantations that have been there since 1990. You can see that they come up quite easily from the air and one can get it down to a hectare, certainly, but even less than a hectare if we want to—something like 30 metres by 30 metres if we have to.

With that type of approach we believe that we can audit the type of sequestration being claimed, and that would be a part of whatever trading system was developed, so I guess the net result of what we are saying is that, while we think there will be a transaction cost here, there is great uncertainty in the measurements at present in land use change, forestry and, to an extent, agriculture. We think these are surmountable, and they need to be surmounted in two ways. They need to be surmounted if we need to argue strongly in international negotiations like the one starting tomorrow for inclusion of further sinks in addition to forestry if the nation wishes that, and we would see that if they went

in they could also be part of emissions trading—we are talking about soil carbon sinks here, although not exclusively, but that is the major one we tend to think of.

Secondly, it also goes across some other sectors outside agriculture and land use change. For instance, fugitive emissions, which Denis can speak about, are also at present not a large amount, but it a significant amount of our inventory. Again, it is quite poorly quantified, and there may be advantages in Australia to better quantifying that, particularly as we come into some large gas projects on the North West Shelf.

Finally, what we want to leave you with is the view that we think the technology is here. We obviously have to put an effort into it, and the national carbon accounting system will lay a base but it will not do all the things that need to be done with regard to an emissions trading set, but it is a new commodity which we think affords opportunities for Australian agriculture and forestry. It is something that needs to be pursued but it can only be pursued with adequate measurement, verification and an auditing system that would work.

CHAIR—Does anyone else have an opening statement, or should we move to questions?

Prof. Barlow—We would be responsive to questions.

CHAIR—I dare say that my first question is from left field. What if the warming of the atmosphere would benefit Australian agriculture?

Prof. Barlow—It is not really too much from left field.

Mr BILLSON—You have read the ABARE paper, have you?

Prof. Barlow—What if it would? Do you think it is in our best interests—

CHAIR—We could have the Darling as the Mississippi.

Prof. Barlow—It also could be the Todd. I am serious, as this is an area that I have been researching for a number of years and in the current climate change scenarios that are about a good study has been done for the Macquarie, where you are looking at consumptive flows that might be decreasing by something like 15 to 20 per cent under a climate change scenario. There would be winners and losers within Australia and the south-west corner of Western Australia is one of the winners. We do not know about the north-east part—Queensland essentially. So I suppose I would say to you that if it were we would then be in a dicky situation because we have signed on to the Kyoto Protocol, but I think even in that case there still would be winners and losers within the vast expanse of Australian agriculture.

I think we will get an increase in plant productivity quite apart from the climate due to the CO_2 effects. In fact, as we know from the Kyoto Protocol, because Annex B has made a commitment to limit its emissions by an aggregate of minus six per cent on 1990, because of the G77 nations continuing to emit, we are still churning towards a doubling of CO_2 and perhaps even a tripling. So I think the answer to your question in some ways—

CHAIR—That we will find out.

Prof. Barlow—We may not, but someone will find out.

CHAIR—So there are signs to suggest that in a high carbon dioxide atmosphere that plants do grow quicker?

Prof. Barlow—Yes. The forestry, in a sense, if adequately fertilised—if you get a real doubling of CO_2—you are probably looking at something like 30 per cent for pinus radiata, similar for eucalypts. Other grasses, depending on their physiology, do slightly differently.

Mr BILLSON—Although semi-arid go the other way with polarisation of—

Prof. Barlow—Well, I do not know whether I quite agree with you.

Mr BILLSON—If you do not then you should talk to your ABARE friends.

Prof. Barlow—They are not physiologists though.

Mr BILLSON—It was in their defence last time.

CHAIR—I listened carefully to what you said about the sequestration and the fact that you could monitor plantations and forests et cetera. But isn't it true to say that it is only the first step? There would have to be very complicated tracking systems as to where that product, the carbon, went to—whether it went into paper or whether it went into trees and how long it was locked up.

Prof. Barlow—This is a significant international challenge we have at present—and Tony might want to say something in a moment—because of the Intergovernmental Panel for Climate Change methodology that is used. The present methodology actually counts all wood as being burned no matter what you use it for in the first year in the country of harvest. So there is an anomaly. We don't know if other countries would regard it as an anomaly but we believe that there is currently an anomaly in the inventory methodology which we have begun to argue in international fora, namely, that you treat young wood differently from old.

Mr KERR—That is why you get that direct line downwards in your graph, isn't

it?

Prof. Barlow—Yes, that is right. Because when you harvest it, you count it; whether it goes to chips or structural wood; and you count it in Australia whether you send it to Japan or whether you send it anywhere.

CHAIR—Yes, I have got that point. The other point I was going to make was something that was said earlier—that the big emitters seem to see that the panacea is to plant trees. There has got to be a limit to Australia's ability to do that. Have we got any figures on that?

Prof. Barlow—I have actually got a few maps. Some of the work that the Bureau is doing in the lead-up to Vision 2020 work this year is to look at the area that has potential for plantation development, both nationally and also regionally.

A chart was then shown.

Prof. Barlow—At the moment, for example, we are actually looking at various species and using published information to identify within existing industrial areas what the remaining landbase is—basically cleared private land and also the potential productivity rates—and the growth rates of those regions.

We are also operating on another scale. On a regional basis, this chart shows work that we have just completed at Eden. This area here has *Eucalyptus nitens*, which is a fairly common hardwood species. We are actually attempting to get the potential for plantation development basically down to the paddock level on a local basis. There are finite limits, and they are largely in relation to competition against existing land uses. On this chart you can see *Pinus radiata*. The colours basically differentiate different productivity and growth rates for different plantations in the area.

Mr BILLSON—Is that microclimate-driven?

Mr Tickle—Yes. We are getting down to the point here where we are actually modelling the difference in net radiation, for example, from a north-facing slope to a south-facing slope, and seeing the changes in productivity.

Mr BILLSON—Binary industry technology.

Mr Tickle—Yes. As to the question you asked in relation to the finite area base, when you look at somewhere like northern New South Wales, where there is currently a great push for plantation development, you are competing against land uses that are $3,000 to $5,000 or more per hectare, and you have to question whether, when you are competing against macadamia nuts, it really is viable to consider plantations in the area. Potentially, we should be considering improving the silviculture of existing forests; this is something that has been left out of the inventory at the moment.

Prof. Barlow—I would agree. There are a couple of overarching points in that. One is, of course, that, under the current rules, there is a limit to sequestration in any particular forest. When you fill that sink, that is all, essentially. Even though you might get into a cutting cycle, that sink is still finite. The only way you can continue to increase the sink is to bring more land into the equation. Phil has those. We have not looked, but I know the states are looking very much at the rangelands.

CHAIR—In other words, the sink is only a short-term benefit.

Prof. Barlow—Yes. It will provide you with a window of opportunity to do something else, with one important proviso: if we were successful in international negotiations in changing what the current rules are in carbon, for instance, if carbon was counted where it was actually burned or where it was used, I guess that would be the major point. It could also be depreciated out according to its end use.

Mr Tickle—And when.

Prof. Barlow—And when it was burned. We could get into the business then of what you might call 'carbon farming' because we could repeatedly use the same thing and take it that we would not have to suffer the harvest drop, if you like. But that currently is not part of the protocol or the methodology, so we cannot count that at present.

Dr Weir—Perhaps I can make a point of clarification about the present rules; I have come from some IPCC meetings about this subject. I should explain that in the Kyoto Protocol—there is a slight dispute about this, but most countries are putting forward this position—what counts is strictly the net emissions that are made during the first commitment period—that is, from 2008 to 2012. So it is what happens to your so-called 'Kyoto forests'—that is, the ones planted since 1990. It does not matter what happened to them before or after, for the purposes of meeting the target for the first commitment period, it is how much carbon was sequestered in that five-year period that counts.

If you then chop them down in 2013, that is an issue for the second commitment period—it almost certainly would be debited against your second commitment period commitments, which of course have yet to be negotiated. That affects the emission trading regime because what you are trading in the first instance is against your target, which is strictly for that five-year period.

Mr KERR—Can I ask a few quantitative questions. What is your estimate of the rate of land use change as a percentage of the component of the target we have? Because land use change is the other side of the new sinks and new forests, plus the rate of land use change.

Prof. Barlow—Yes. The rate of reduction of land use change.

Mr KERR—Yes. That is right; that was specifically grandfathered for us.

Prof. Barlow—Yes.

Mr KERR—What is your estimate of that in terms of what we will be able to benefit by?

Prof. Barlow—There are a couple of important provisos. This is my job in the next few days in some ways.

Mr KERR—Sure, I accept those qualifications. Perhaps you could take on notice to revise down or up, depending on how it goes.

Prof. Barlow—Perhaps it would be best to take on notice the quantitative figures you are looking at, because one of the real questions in this is that the land use component has a number of subcomponents but the most important is the soil carbon, the carbon that essentially leaks out of the soil in that period after the trees are cut down and either decay or are burnt. The methodology in that is changing somewhat. Initially, it was, if you like, decayed away over 20 years in a straight line fashion. The next inventory that will be published will include an exponential function which will decay that away a little earlier and probably decrease the amount of reduction we will get out of that. But I will take this on notice, if I might.

Mr KERR—On the older methodology, which was the straight line reduction, which was the inventory structure that was then—

Prof. Barlow—Yes, that's right.

Mr KERR—required under methodology, what was your estimate?

Prof. Barlow—The estimate of that depends on what base level of clearing you get to. If you take clearing to zero, which I do not think anybody—

Mr KERR—That is what I am saying. If you took the total land use change, I suppose, opportunity, what does it represent in percentage terms?

Dr Weir—Perhaps we should preface that by saying there is an uncertainty in the level in 1990 so—

Mr KERR—Taking all the equivocations out, you must have a number in your head—or a band.

Dr Weir—A band is about right. The figure in 1990 in the published inventory is 122 megatons for that. But that is uncertain by a large amount, notwithstanding the methodology adjustments.

CHAIR—Plus or minus what?

Prof. Barlow—Eighty per cent.

CHAIR—Is that right?

Prof. Barlow—Yes. And that is probably generous.

Mr KERR—Seriously, I need an answer for this, because if we are serious about trading and opportunities we need to know against what realistic parameters we are operating. And this is one of the things that is continually fudged. People say it is difficult et cetera, and we avoid actually putting some numbers but we have to have numbers in our heads otherwise the whole process is absurd.

Dr Weir—Those numbers are still being worked through and they are fairly touchy in international negotiations, which is one of the reasons why we are not putting them too much on the record.

Prof. Barlow—The best numbers to go with are those in the 1994 and 1995 inventories. The 1994 inventory quoted the 1990 figure as 122, which Tony said. I think that in the 1995 inventory that did decrease to something like a level of 84, again with that uncertainty. These are published figures in our greenhouse gas inventory. So in terms of official figures to use, I think they are the ones. But the caveat is there that the uncertainty is rather high.

One thing I could add is that BRS is going to report in September this year. We have been conducting the first full remote sensing study of land use change or land use clearing from 1990 to 1995 around the whole of Australia. Some of those figures have made their way into the inventory, namely, the Queensland figures—we work with the states in doing this. We are currently going through an error analysis in that, because we want this to be a figure that really is definitive and stands up in the international forum, because there is a lot of pressure on us in—

Mr KERR—I understand all this and I understand the point you make about international sensitivity, but may I assure you that international countries are doing their own calculations—I am sure you are aware of that. And all of the methodologies that we are seeking to articulate have to come forward—in fact, you are going to a negotiation tomorrow which begins further articulation of those issues. What I want to know and what the committee needs to know is what this represents against our target of eight per cent plus.

Prof. Barlow—If you take the following assumptions: one, you take the mean, you don't take the error bar; and two, you assume that land clearing goes to zero, what it represents is that, if you decrease land clearing in 1990 to zero in 2010, you are looking at

a window of 84 million tonnes of carbon dioxide equivalent, essentially. That makes up the current inventory of 484, so that is in the region of about 17 per cent.

Dr Weir—However, it would have to be said that that is the very top estimate. All the indications are that the initial 1990 estimates were probably too high, and certainly the published figure of 122 is too high because we now know the biomass in Queensland that correspond to that figure to be lower. It means that that published figure of 38 megatonnes decreased between 1990 and 1995 is probably just about an upper bound—it is a published figure; it is definitely in the international domain—of what we could expect to save out of decreases in land clearing to the commitment period. Prudence would dictate that we would be operating on a lesser figure than that. That figure of 38 is a bit less than 10 per cent.

Mr KERR—I understand all that but, notwithstanding that, there is a substantial opportunity to get greenhouse reductions by effecting the rate of land use clearance.

Dr Weir—Certainly.

Mr KERR—And of a dimension that outstrips almost anything else available to us, I would suspect.

Dr Weir—That is correct; that is exactly why we fought so hard to get those provisions in the protocol.

Mr KERR—But without articulating anything of this nature, so the only people who were not aware of this were not the international community but the Australian domestic community.

Dr Weir—I would not say that.

Mr KERR—Can I make another point: if this is so, what policy options are available to an Australian government to effect the land use rate of clearing so that we can address this? Are there any tradable issues that would go to land use clearing as opposed to plantation establishment? If you can get this great gain out of reducing the rate of land use clearing then, presumably, that is something which policy should be directed towards and, in terms of our inquiry, if that represents the possibility of a 17 per cent reduction or less, I appreciate that—

Prof. Barlow—That is an upper limit.

Mr KERR—That is an upper limit. I understand the methodologies are subject to discussion, and I understand whether the rate is discounted at a fixed level, which was a previous methodology, or at a sine curve type or exponential curve down. All those sorts of issues I understand but, nonetheless, whatever one does, it is going to be the most

substantial opportunity to abate greenhouse gas related emissions. What measures do you put forward to us as an opportunity for us to consider in this inquiry, which is about trading, that would affect that issue?

CHAIR—They are state planning issues really.

Mr KERR—But can they be addressed by an economic measure? Given that we have an approach which differs from the old command and control to economic incentive, we have been focusing—and I think correctly—on the opportunities that plantation establishment has. But there is a whole other side to it which is the rate of change in land use, which gives us a far greater opportunity, which is apparently the great unspoken secret of these negotiations, which no-one has come to us to address, which you know about and which, perhaps, could have some economic measures designed to address it.

Dr Weir—Perhaps I had better take that one—

CHAIR—I think I knew about it.

Dr Weir—I was going to say that there were plenty of lobbyists going into the Kyoto Protocol and there were plenty of letters to ministers from various, particularly environmental, groups who were raising that issue. Perhaps I should say, and as the chairman has remarked, that land use laws are in the domain of the states and, as such, the powers of the Commonwealth are severely limited. That is the first point.

Mr KERR—That was not the point I was asking about. I was asking has any work been done about an economic instrument which would be more effective in addressing this than traditional command and control mechanisms, which have not thus far proved to be particularly effective?

Mr BILLSON—Like you get a credit for foregoing—

CHAIR—States might be able to control arrangements of that nature.

Dr Weir—I am just coming to that. First of all, I remarked that the legal measures are in the domain of the states. Secondly, there are some references to that and some potential measures—although not very restrictive measures—being put forward in the forthcoming National Greenhouse Strategy, which of course is joint between the Commonwealth and the states.

Thirdly, on the issue of whether that could be embraced in a trading framework, first of all, I would say that the CO_2 Forest Sinks Pty Ltd which is following us into this inquiry would certainly take the view that you can. That is part of their submission, I think you will find. Certainly, there is a view that you can, but I would have to say that there are technical difficulties which are similar to those of the transport sector in terms of who the player is, who holds the permits, how they are measured and all that kind of thing.

Mr KERR—I am asking if anyone has done this work. For example, it seems to me that if, hypothetically, the present regulatory regime is in the hands of the states and states like Victoria wish to continue brown coal generation without too much adverse consequence—and others will wish to do the same—there may be an opportunity for them to attach a commitment to certain kinds of land clearing measures which then gives credits at that state level which can be used in various ways. I do not know. But I am interested, conceptually, that this whole debate has occurred against a framework where a very substantial opportunity of abatement, which applies only to Australia and to no other country, is not being put in the frame of this economic debate.

In other words, I do not think any of the submissions that have come forward to us squarely address the way in which you could bring into economic measures those issues which hitherto have been command and control regulation at state level.

Dr Weir—I would suggest that the next set of appearances will probably address that to some extent. And I would also point out that the submission from the Department of Primary Industries and Energy, in one of the attachments about coverage, does go into some detail on this very issue—although largely to point out that there are a lot of transaction cost difficulties—I mean, who is the finger pointed at?—but the issue is explored there.

Prof. Barlow—I am not aware of a lot of work going on into that matter. Definitely, in the technical sense, we see the need to establish a biomass map of Australia—and that will be one of the subprojects within the national carbon accounting system—because such a map is one of the things you would really need to know what you are talking about in terms of carbon sink credit in uncleared land. You need to know it much more precisely than we know it now.

Mr KERR—Can I ask you for an undertaking to follow up, Professor Barlow—because you will be able to give us greater clarification on this in terms of new methodologies that arise from this meeting in Germany—on whether any of the decisions that are taken at the preparatory conference for Buenos Aires would affect the calculations and, if so, by what amount? Could you also give us some sort of updated figures on what this means in megatons of carbon. Also, particularly if you do change the methodology so you get a whole-of-life cycle rather than the assumption that the product is simply burnt at the end of it, again could you tell us what that dimensions would be, because what you would lose in terms of the exponential graph changing you could gain in terms of the whole-of-life issue? There are swings and roundabouts in this which will affect what opportunities exist.

I have to go—and I apologise, Chair. It worries me that we are seeing it as a serendipitous thing that land cannot possibly be cleared at the same rate we cleared it during the 1980s and so there will be something left at the end; and yet we are not seeking by policy to maximise the natural advantage that we accrued by reason of this

measure having been included, with the joint advocacy of both Senator Hill and myself in some background negotiations at Kyoto. I would hate to see what was acquired there squandered because we do not actually develop economical policy measures that enable us to maximise that gain that was acquired.

Prof. Barlow—If I could make a comment on that: I attended the Bonn meeting before Kyoto and I think that was the first time I tried to put land clearing in the framework of the landcare movement in Australia rather than, in fact, as something that we did not wish to talk about. I think it is much better if you look at it in that framework. Indeed, no matter what policy instruments are brought into play—and as Tony's group think about it—we look upon the decrease in land clearing as in the framework of the landcare movement in Australia rather than as some serendipitous advantage. We certainly are not looking at it in that way.

CHAIR—It is a complicated area, whether you are talking about actual land clearing or clearing of regeneration, because this has a big effect on agriculture.

Prof. Barlow—Yes.

Mr KERR—All I ask is that there be a formal undertaking that that material will be supplied, when you are able to.

Mr BILLSON—Concerning the satellite work and the biomass work that you are talking about, I assume that would bring into account conversion of mixed indigenous vegetation to homogenous arguably high sequestration value plantations, so you would end up with a net outcome, recognising that the clearance in the first instance loses capacity. Is that part of the idea of that technology?

Prof. Barlow—Yes, it is. We would pick up landcare. Obviously, you have to clear it first and so we would pick up that clearing.

Mr BILLSON—Yes, the point being, that way also we would send signals to people wanting to invest in sequestration forestry to look for cleared land first before getting into the—

Prof. Barlow—Yes. There is a definitional issue too within the Kyoto Protocol that we are trying to grapple with here, that is, the meaning of 'afforestation' and 'reafforestation' because clearing land and immediately putting it into plantations might be seen by some as normal forestry and therefore not included in the protocol. 'Afforestation' under the current definitions—and these are going to be debated—means that you are foresting land that has not been forested before. 'Reafforestation' is at this point a significant break between having forest on that land and then reafforesting it. That at present would not cover a situation where, as is happening in Tasmania, land is cleared and then you put in plantation.

Mr BILLSON—That would strengthen our argument in terms of credibility where we said it should take that into account in all fairness.

Dr Weir—Perhaps, but it would be a very difficult argument to run in the Kyoto context and certainly one could not rely on getting credit for that in the context of the Kyoto Protocol.

Mr BILLSON—Bearing in mind the uncertainties around the science and quite rightly the verification and auditing issues, does that in your mind in a trading concept push you more towards sequestration as an offset to emission rather than generating new emission capacity by creating credits; that is, you would get into a net emission framework for emitters. So you would take their emissions and then they would have to do the legwork to verify the sequestration outcomes of associated forestry activity. Then you would get a net position that they would have to cover by permanent regime, rather than letting the emitters do their thing and then the sequestration people creating a stand-alone permit in its own right.

Dr Weir—That is an international issue at the moment. One of the things that is going on in Bonn and in a lot of the lead-up negotiations is discussing the question: what would the international rules be for emissions trading? That very issue, which of course is at a national level in the international context, is indeed up for debate. Those two approaches are both on the table and, as you heard from Dr Dobes earlier, they are almost equivalent. So it could go either way and it is an open debate.

Mr BILLSON—Yes, although it lands the transaction costs somewhere else.

Dr Weir—That is correct, and that is part of the debate.

Prof. Barlow—I suppose my technical view on that is that they should be equivalent credits. I am very aware of the debates that Tony is talking about. In fact, the transaction cost is probably on the vendor in that case. The reason I say that is that I see the opportunities in a farm forestry context, which are somewhat less than large plantations which probably have to be verified on the ground.

Mr BILLSON—Through catchment authorities or local councils.

Prof. Barlow—The other point we would make from BRS is that the technology is there to do that, I frankly do not think it is going to be as big a transaction cost as people are expecting.

Mr BILLSON—You would rely on some default values unless you approved a case that your sequestration performance outperformed the default values. Is that one of the ideas that you are looking at to reduce transaction costs?

Prof. Barlow—That may be one, but I think there is always going to be the onus on the vendor to know what they have. It is the same in any other transaction. I cannot see why it would be any different here.

Mr BILLSON—I have been harassing Senator Hill, the Prime Minister, the Treasury people and Minister Moore to try to have Australia recognised as a UN greenhouse centre for the purposes of verification, audit, clean development mechanism verification within a region and those sorts of things because of the excellent work that you people and others are doing, which is leading the technology—

CHAIR—You do not really expect them to disagree with that, do you?

Mr BILLSON—I am interested in a reality check with you players. Is that something you feel has a life? We are not the Americans and we are not the Europeans, so both of those things are in our favour in terms of other players in our next one. Is that an idea that is being developed, or are we too far short of that?

Prof. Barlow—The chairman is right; I am not going to disagree with you. But let me flesh it out a little more. Firstly, in land based science—you start from the science base and work through the technology—Australia is pretty good. If you look at agricultural research, we publish about four per cent of papers as opposed to two per cent in the rest of our science, so we are at about twice our weight there. In ecology, we bat at about 1½ per cent our weight. So in the straight science base we bat above our weight at present, and we are well respected internationally in those things. In this area, Phil has given you a quick South Australian example, and I believe you are coming to visit us on 25th where we will give you a better meal of this technology. In BRS information and satellite technology, we are up there. Obviously, a lot of that comes out of the United States, because they are the people who put out the satellites, but we have not been remiss in adopting those technologies.

Thirdly, I think we are in a very good position to do that but it would require a commitment. The science community would be willing to make that commitment but it would require a commitment from government in order to do that because obviously it comes down to resources. At the end of the day, Australia is different in the sense that we have a very large land area, we have few people, and ultimately we are going to have to use remote sensing technologies to really make the sort of measurements we need to make. These are really becoming quite sophisticated these days. I think they are the way of the future.

Just to give you a small example—it is very small because time is limited—the way our model of forest potential now works is that it is actually a triangulation with a climate model down to very small areas, it has a digital terrain model which tells you how high you are and what side of the hill you are, and it also calculates how well the forest will grow. But then it talks to the satellite that goes over and says, 'What's there? How thick is the forest already there in terms of a thing called the national vegetation index?'

So you have a model, you have a spatial information system on the ground, and you have a satellite that triangulates. That is the sort of technology that will be the way of the future.

Mr BILLSON—The thinking is that it would strengthen an argument to support the science further, not just for a good Kyoto outcome but as a new value that the nation can benefit from by having that sort of greenhouse traffic coming through our country and being recognised as a centre of some excellence.

Prof. Barlow—But as I began, I think there is a potential opportunity there that, quite apart from the land clearing issue and quite apart from the plantation forestry issue that is not in the protocol at present, if we were to make that commitment, the fairly large sinks in the rangelands and, indeed, the soil carbon sinks that we know are potentially there will require the verification and the scientific arguments to be made in the negotiations in order to get them in the protocol by the first meeting of parties. So there is an opportunity there, but it will take a lot of science and a lot of good negotiation as well.

CHAIR—Before you leave, Professor Barlow, I would like to raise the issue of emissions by animals.

Mr BILLSON - I was going to raise that on the flip side, which is sequestration of the marine environment and whether we can cash in the EEZ that we now have responsibility for.

CHAIR—I am interested in what gauges you are going to put in those animals to estimate their emissions.

Prof. Barlow—Yes; we are short on population, aren't we. We do the agricultural inventory. That is done by using stock numbers, and we are trying to take it down now to a shire level. We know from tracer studies and the like that, under certain diets, animals will emit certain amounts of methane. So we basically use a stock number as opposed to what their diet is at the current time.

CHAIR—So you would say that 100 million sheep and 30 million cattle, or something like that, would equal a certain figure?

Prof. Barlow—Yes; equals—by season and by area. We are now getting down to a spatial area. So we know that a cow roaming around Queensland and taking four or five years to get to a marketable age will probably emit more in terms of productivity than a cow in Victoria reaching marketable age in two years or something like that. But it will all come with the diet. The only other thing I would say is that a part of the Prime Minister's greenhouse measures is a CSIRO technology which seeks to reduce methane emissions from animals by a vaccine which is used against the methanogen bacteria in the rumen. They now have a commercial backer.

CHAIR—It would only be practicable in intensive industries, though, wouldn't it?

Prof. Barlow—No, it is not. That is why the vaccine is the advantage, because it is perhaps a twice-a-year injection.

CHAIR—So when you do them for worms, you do them for that as well?

Prof. Barlow—Yes. It has a productivity benefit as well as a methane benefit.

CHAIR—I have to say that the mind boggles.

Mr BILLSON—Professor, I would like to turn to the marine environment.

Prof. Barlow—I was hoping you would not ask that question. We do not have very good data. Firstly, our economic zone is bigger than the land area of Australia. It has been a very vexed issue in the international negotiations—and Tony may want to comment on this, too—because what you are looking at is some modification of the marine environment, whether it be the fertilisation of a nutrient that is required there or some other such thing. That is a fairly emotive issue and, certainly, we are not doing any calculations along those lines as a potential sink at present. I know that it is quite an emotive issue in international negotiations.

CHAIR—In the world scene, it has to be a huge sink, doesn't it? It has to be the biggest forest on earth.

Prof. Barlow—It is. It is already counted in a sense. In round terms, the world emits about eight billion tonnes of carbon each year, of which about four of that end up in the ocean. The rest ends up in the atmosphere, and then there is one billion tonnes which is difficult to find—we think it is in the land. Of course, the ocean is already the largest net sink in the world.

Dr Weir—That is the global ocean.

Mr BILLSON—So is the science saying that it is therefore neutral for the purposes of calculation? Are you saying that unless some conversion is made to enhance its current function, it is not really a factor?

Prof. Barlow—Yes. The word is anthropogenic, you see. It would have to be intervention, and I was just saying that the interventions that most people have talked about are fairly unpalatable.

CHAIR—I know it is right on 11 o'clock and I thank you for your evidence. We might carry on for a little while with your colleagues. Good luck.

Prof. Barlow—Thank you.

Mr McDOUGALL—We have talked about the measurements you have taken and the limits of sinks. We have looked at the power, the aluminium, the transport, the cement and the steel industries all wanting sinks and you have put in your paper a reference to all the options with regard to trading permit methods. You have even thrown in a new one which interests me—grandmothering, rather than grandfathering—I thought that was intriguing.

Dr Weir—It is a reference to the DPIE submission. I don't really want to take too many questions on that today, if I may, because I have been asked from on high to come back on that. It is called grandmothering just to distinguish it from grandfathering.

Mr McDOUGALL—What do you believe is the best trading method of payments and how should these be set up? Should we be setting them up as free—because you have listed all the—

Dr Weir—They are allocation issues which is a question I will definitely take on notice until we come in with the other bodies, thanks. The short answer in that submission is no; we just set out the pros and cons of the different ones and do not come down on any side.

Mr McDOUGALL—But isn't it in your interest to come down on a side? Because it is very much in the interests of industry to come down on the side they want, which is sinks.

Dr Weir—That depends on which industry you talk to. I am sure the submissions to this committee show a range of views on what is the best method. There are issues, for example, to do with new entrants to the market who do not want to have to pay for things that their competitors are getting for free. They are all equity issues in one way or another. The short answer is that there is no simple answer, and in a submission from a department, as distinct from a government, it is not for us to give the government an answer while the policy debate is open.

Mr BILLSON—It is a bit hazardous.

Mr McDOUGALL—But there is a line at the end where you say, okay, technology improvement to take place as opposed to creating an easy sink. I see that we have two different levels of countries, with regard to whether they are in the protocol or out of the protocol. Companies have the opportunity—through international trading in permits—to be able to transfer their responsibility to some other place rather than having to achieve technology improvements. This is why I am a bit concerned about this mad rush to create sinks. It is going to achieve an end result, and a measurable result from what you have said to us today; but, at the end of the day, is it going to cut back on emissions where

emissions can actually be cut back on?

Dr Weir—I think that is a good question and we would say that there are many programs the government and industry are pursuing—such as through the greenhouse challenge mechanisms and so on—which are actually producing reductions or decreases in the rates of increase of emissions. So there are technologies and there are incentives to do it, even in an emissions trading scheme. But, in general, I would take all those questions on further notice.

Mr McDOUGALL—Specifically, where I want this question answered is: I can see all that in relation to a domestic trading scheme, but how do we approach it in an international trading scheme? That is the part that bothers me, because you will have the situation where you get a power generator in the UK who transfers from coal to gas. He gets a credit for it. He may end up in a trading scheme and get a credit for the decommission of the plant, and he may transfer some of those credits through to another country which benefits; so his country does not get any direct benefit even though it was in the original protocol.

Dr Weir—He can only transfer them as a credit under an emissions trading scheme to another country which is Annex B, another developed country. Emissions trading in the protocol is only within Annex B countries. So if, say, a power company in the UK as you described went out of the power business completely and they had got an allocation of permits for their emissions and they no longer were emitting anything, they would naturally sell those permits and they could be bought by, say, a power company in Victoria or another power company in England or whatever and used there.

CHAIR—Wouldn't there be country limits as well, though? I think Graham is saying that transferring the right to emit, especially in annexure 1 countries, there would be limits in the country as to what you could emit, wouldn't there?

Dr Weir—Yes, but if you acquire permits that changes the limit. That is the point. So if, for example, a Victorian power company bought the permits that this English power company no longer needed that would raise the limit on Australia's total emissions under the Kyoto Protocol.

Mr BILLSON—We would report our target plus acquired offshore.

Dr Weir—Exactly. That is the whole idea of international emissions trading.

Mr BILLSON—Can I just ask a question about the fugitive emissions? It was put to me before the Kyoto round that if we were rigorous in recording and accounting for fugitive emissions the losses that come out of some of the Soviet pipeline arrangements—both in the production phase where you do not have the gas types that are sought for the purpose plus the energy consumed in maintaining pressure over the length of the pipelines

plus leaks in the pipelines—would amount to a higher emission than our total national emissions. Would you care to comment on that, and how those sorts of fugitive emissions are or are not accounted for under the current arrangements.

Mr Wright—First of all, there is a problem with the gas industry, whether it is town gas or natural gas, in terms of leaks. In the past, leaks have been a safety issue but they have not been a big money issue. It is true that in countries like Russia very high leak rates have been reported. I would say, without checking the numbers, that what you are saying sounds feasible.

There are couple of issues. One is that there are avoidable leaks, which are things like improving integrity of pipelines or having conversion processes for compression or liquefaction processes that are more efficient, and there are unavoidable things such as, if you like, a second form of carbon dioxide which comes from the ground in the form of CO_2 in the natural gas, and that has to go somewhere, no matter how efficiently you process it. In terms of the methane that comes out: in principle, if you have a reasonably efficient pipeline system and upgraded high quality pipelines, you can reduce them to something close to zero. In states like Western Australia that have relatively new pipeline infrastructure networks they are getting down towards that. In older states that have a hundred years of gas industry like New South Wales there is an issue about leak rates from pipelines; it is quite serious in some areas. So it does not just apply to Russia; there is a problem with leaks from pipelines in general. Because the methane has about 21 times the effect of carbon dioxide, even a flare that is burning—

Mr BILLSON—You settle on 21, do you?

Mr Wright—Assuming you were going to take 21 as the number, if you have a flare that is burning, say, waste gas, from a refinery or offshore on an offshore platform and it is 95 per cent emission efficient, then 95 per cent of emissions will be CO_2, and the other five per cent will be methane. That five per cent will have a huge effect because of the multiplying factor. So there is a lot of work that could be done on either reducing flaring or re-injecting gas underground that would otherwise be flared or vented. Because, in the past, flaring or venting was seen as a safety issue—an easy way of getting rid of an otherwise hazardous matter—there has not been a lot of technology directed at that.

Mr BILLSON—Is the accounting framework conscious of those differences?

Mr Wright—Yes. We explicitly put into the accounting framework efficiency factors for things such as flares and venting. The one that is difficult to measure is leaks in pipelines because we might have a pipeline that is a few thousand kilometres long. But that is currently done by what is called ‘unaccounted for gas losses’. In other words, they have a measuring meter at one end of the pipeline and they know how much they are selling to their customers at the other end. Typically, that might be anything from one per cent to maybe seven per cent of all the gas that goes through the pipeline. They know a

bit of it comes from compressors and known purges for maintenance and such things, and you can take maybe one per cent off for that. The rest of it is assumed in the greenhouse gas inventory to be vented by leaks along the way.

Mr BILLSON—So when the gas industry is marketing itself as a greenhouse friendly fuel—and they are talking about the reserves of South Australia which have an eight per cent venting component to them compared with 22 or something up in the north-west of Western Australia—those variances are reflected in the accounting framework for emissions?

Mr Wright—Yes.

Mr BILLSON—So bringing that to account will be reflected in the different compositions of the gas reserves around our country?

Mr Wright—Yes. There are two factors. There is the composition of the gas coming out of the ground—and some gas fuels have quite high CO_2 compositions—and there is also the distance to market and whether you are going to liquefy it. The liquefaction process uses up quite a lot of gas, and that ends up as CO_2 as well.

CHAIR—Obviously quite a bit of methane comes from coal mines. I suppose there was never the incentive in the past that there is now to develop co-generation and get back into the grid. There would be opportunities, would there, to—

Mr Wright—That is right. There are two things that are happening on that front. First of all, some coal mines have to drain the methane anyway for safety reasons. Coal is divided into four groups. There are brown coal mines and open cut coal mines which are considered to have virtually zero methane. Then there are class A and class B underground mines, which have different degrees of gassiness. So there is a safety incentive to remove that. Some coal mines already are feeding back power from that either for their own use or into the grid. Then there is coal bed methane, which is developing things quite apart from mining the coal—sometimes by surface drilling without creating a mine—just for the value of the methane in the coal itself. That is big in places like Alabama in America. There is some work being done on that in Australia, which essentially is capturing methane for the electricity grid in conjunction with mining, or ahead of mining, or just as a separate project.

Mr BILLSON—So you would suggest that where some others have argued we should start with CO_2, you would recommend that we include at least down to methane?

Mr Wright—Methane is now included.

Mr BILLSON—I understand that. It is one of the six gases—

Dr Weir—That is discussed in our attachment 2. The conclusion is, as Denis says, that fugitive-type methane emissions, which potentially are well measured, can be anchored to a relatively small number of players, for example, a coal mine, and are quite suitable to incorporate in an emissions trading scheme.

Mr BILLSON—Some abatement measures are being pursued that use microbe technology to see the organic component of municipal waste streams converted into a soil improvement product without having methane generated. That is a substantial net saving and I would hate to see that not recognised on the way through.

Dr Weir—That is exactly right. Some of those abatement measures are written into the national greenhouse strategy and are certainly recognisable in the inventory—and I can see no reason why not for trading purposes.

Mr Rossiter—They would be in the waste inventory, which is currently being revised at the moment. There is a revision of all these inventories presently.

Mr BILLSON—Who, in your view, would gain the credit? The municipal waste manager or the provider of the technology?

Mr Rossiter—I would imagine the manager, but at this stage—

Dr Weir—Whoever had the permits to emit in the first place.

Mr Wright—It is not as big an issue for Australia, because of our low population, as it is for places like Europe.

Mr BILLSON—And Alabama with the pig farming sector.

CHAIR—There is a contradiction between your submission and what was put to us by previous witnesses on the permit system. I think your submission says that you prefer the permits to rest with the wholesalers, the large users, rather than with suppliers. The previous witnesses talked about end users. The anomaly I see in that would be if you take city transport which is generally electrified and would be seen as clean energy, but the person who is generating the energy is a fairly big emitter. So where do these permits sit?

Dr Weir—Exactly. There are lots of different answers to that. Essentially they have to sit somewhere traceable and somebody has to be responsible for the emissions. This is an issue we could go into more when we are discussing our submission thoroughly, but in brief there are options. The inventory counts the emissions associated with electricity at the generator, so that is one possibility, but the electricity market, the trading in electricity, takes place at the wholesaler-retailer type level. Therefore, that is another potential point. All electricity has to pass through one of the buyers in the electricity

market, and there are not that many of them.

CHAIR—If it is hydro-electricity, it is clean electricity.

Dr Weir—There would be no permits associated with it.

CHAIR—I suppose you could argue that, to a certain extent, nuclear energy is clean energy. Europe is arguing that. How do we give them credits?

Dr Weir—You would not get any credits because you would not need any permits in the first place. Unless there is a change, they do not need any permits.

Mr BILLSON—Their argument is: how do you recognise the inherent virtue in what they are doing?

Dr Weir—That is another issue.

CHAIR—Unfortunately, we are going to have to leave it at that, but you will be coming back on 9 June, I think. Thank you again. I do not think this debate has concluded yet. We will probably see you again.

[11.19 a.m.]

BOROUGH, Mr Chris, Director, CO_2 Forest Sinks Pty Ltd, PO Box 125, Campbell, Australian Capital Territory 2612

BOURKE, Mr Max, Director, CO_2 Forest Sinks Pty Ltd, PO Box 125, Campbell, Australian Capital Territory 2612

COLLINS, Mr Rory, Chairman, CO_2 Forest Sinks Pty Ltd, PO Box 125, Campbell, Australian Capital Territory 2612

CHAIR—Welcome. We have received your submission and have authorised its publication. Are there any changes you wish to make to the submission at this stage?

Mr Collins—Could we speak a little to the submission?

CHAIR—Certainly, you can make an opening statement.

Mr Collins—I might introduce myself in a little more detail. If each of us does that, it will help to give an image of how and why we have formed this company. It is an assembly of people who have very much a common vision but come from different backgrounds. I hope, without your finding it too tedious, that will illustrate where we think the strength lies.

I will ask Max Bourke to talk in a little more detail about the organisation, as he is credited with bringing us all together with the initial concept. I will also ask Chris Borough to talk a little as a scientist in forestry on some issues in our submission, and one in particular which is an omission which arose from our not having had the benefit of a detailed look at the Workbook. I am hoping that this will help add to the collective insight of the committee.

I thank you for the invitation. It is fantastic for us and it causes us to have to get our thoughts a little bit more together, which I think we have been able to do. I have spent the last 30 years in and around the stock market, starting with the Sydney Stock Exchange for 12 years, almost entirely associated with the technology of developing our markets. I then spent five years with Coopers and Lybrand in the 1980s, and that was associated with running registry services—they were the largest share registrar in the country and they probably still are.

I then went back in 1986, prior to the formation of ASX, and my role at ASX was to put together the technology for a national stock exchange. You will begin to get some flavour that there is one leg of the perhaps three legs that we as an organisation feel we are going to have to stand on, and that is the operation of a market. As I am sure you are aware, you can look at a market in many ways, but I always look upon it as basically

three parts. One is a price discovery part. By bringing people together—it used to be in a room but it is all electronic now—you can establish a price for a commodity. The stock market is a share and futures market—it could be many things.

The second part of that is to have an efficient meeting between representatives of buyers and science and making that an effective and efficient process for what is called DVP—delivery versus payment. Ownership moves one way and payment moves the other. The third part of the market, which is probably not so applicable in this situation, is the raising of capital by having owners of risk companies able to go to those centres for more capital. We do see that this is an important part of our vision, if you like, for CO_2 Forest Sinks and the opportunities that this presents—it is a fantastic win-win situation in terms of the opportunities to use the common will to address emissions with a very distinctive opportunity to promote and assist farmers.

If there is an emphasis in our directorship and our shareholders, it is the farming community. This is an opportunity, we believe, to facilitate, encourage and foster good farming practices, particularly the growing of trees. I will now ask Max Bourke, as our author, to flesh out a little bit more how he came to form CO_2 Forest Sinks.

Mr Bourke—Thank you for the opportunity to appear before you. I spent much of my working life from the 1950s working in agriculture and the private sector, studying in public agricultural science eventually and then working as a scientist and subsequently in the CSIRO. I then spent 23 years in the federal government as a senior executive, much of that time as head of one of the major environmental organisations in this country. I have written at length publicly about my interest, which is the history of conservation in Australia.

I formed a view over that long period that many of the major conservation issues were caused by activities that had been encouraged by government regulation rather than discouraged by government regulation. It is a pity that Mr Kerr has gone, but I formed a view very strongly that the command and control liberal education philosophy was not working in environmental protection—that that is an easy way out. In a way, governments are forced by the community to bring in legislation which in net effect has not led to huge benefits but has led to significant costs.

A few years ago I left the public sector and went back into the private sector. While working with a major new farming organisation in the central-west, of which I was the first CEO, I became aware of a particular problem within the irrigation industry to do with salinity and rising water tables, and we then looked at ways of solving that. We mention briefly in the submission that one of the ways we could wind together a significant solution to those two problems—not everywhere, but in parts of Australia—would be for land holders to become more effectively involved in farm forestry. I have a number of colleagues and friends—Chris Borough amongst them—who had looked at the economics of farm forestry over the years and, quite clearly, despite the government's plans with

Plantations 2020, the economics are not good for farm forestry in Australia.

Carbon dioxide sequestration is, in my view, an important way of making farm forestry profitable. It is an important way, if it is encouraged and allowed free rein, to make a start on solving salinity and water table problems, synchronously with solving the CO_2 problem. I should say partly, because farm forestry per se will not stop carbon dioxide as a problem, but it will give us some breathing space. We do not see this as any substitution for other techniques of reduction of CO_2 emission, but we do think it is an important adjunct to it.

I brought together this group of people, whose CVs I have given you a very brief outline of there, that cover those backgrounds. It was interesting to hear Professor Barlow quoting some of the work of those who have been involved with us—David Bennett, Chris Borough and others—in doing the modelling on climate change in the Macquarie Valley. We wanted to bring together the skills base necessary to set up a trading system, in alliance with a significant number of growers of farm forestry, so that the potential would be there to capture the economic benefits in the rural sector. I think we have put together a group of people who are competent to do that.

We have really only had our shingle out, as it were, as traders for a matter of months, but I believe within the next few months we will see some significant starts to trading in Australia. As Rory said in his opening statement, our belief is that eventually this will be a system that is traded on a proper market basis—whether it be in the Futures Exchange, which seems more probable as a form of trading, or possibly the Stock Exchange too if they chose to enter into this field, but I do not know that they would—but some formal mechanism like that will emerge. In the short-term, it will be across-the-counter trading whereby sellers of CO_2 sequestration will match up with buyers of CO_2 emissions, and we hope to be a part of putting that together.

We see that as a complicated process. We do not see it as a simple process because, to bring to account the variations in climate within Australia let alone losses of forest due to fires and diseases, et cetera, all of those things require having large stocks of CO_2 sequestration available so that you can provide a fungible instrument that is acceptable.

As I have said, we believe in an ethical system. We hope that we can provide a transparent trail between seller and buyer that will be part of whatever framework the government establishes. In our paper to you we urge that a system be brought into place quickly, if there is to be a government controlled system. Having spent 20-something years negotiating federal-state relations, we understand fully that there is going to be a minefield of years of fighting between federal and state bureaucracies over some of these issues. As someone who spent 2½ years in the High Court over the south-west Tasmania issue many years ago, my view is that the Commonwealth's position in relation to environmental control is not super clear, and it leaves plenty of scope for fights between

federal and state governments over years.

We believe that if there is to be a start in this field, it needs to be made soon, and it needs to be made on a conservative basis so that, as we say in our paper, if there is to be any amendment in the future, the land-holder will benefit on the upside rather than the downside. In other words, we believe a trading regime should be based, perhaps, on bringing to account only above-ground sequestration to start with, because it is difficult to measure the below-ground carbon, and better techniques are required. If techniques eventually become available to do that, it will be a plus-side rather than a downside. It will always be harder for legislators to crank the system down than to crank it up.

CHAIR—Mr Borough, do you want to make a comment?

Mr Borough—Yes. I will briefly give you some background as to myself and my firm. I am a forester and I have been involved in a range of activities, from education through to plantation management. I have also been involved with CSIRO in the science of forestry for a number of years. I have been a consultant for the last 12 years. I am currently with Margules Poyry, which is part of the international firm, Jaakko Poyry, the largest forestry consulting firm in the world. I have been President of the Association of Consulting Foresters of Australia, and I am currently undertaking verification for two carbon trades in New South Wales.

Attached to our submission is the draft of a paper, which is pretty well a final draft. If you wish, I will table the actual copy of the paper here. If someone would like to take a copy of that, please feel free to do so. The authors of that paper are all directors of CO_2 Forest Sinks Pty Ltd—that is, Max Bourke, David Bennett and myself. I think that really sets out fairly clearly a number of the issues involved from a plantation grower's point of view, if you like.

In addition, we have been looking at the Greenhouse Sinks Workbook for the Greenhouse Challenge Office, which is in a draft form at this stage, and we have given a formal comment on that. A particular issue which has come up in relation to that would be the extrapolation of the findings here to a broader context. There is a particular clause in the workbook called the 'Additionality clause', which really says, basically, that everything you do in terms of greenhouse challenge office has to be additional to what you might have done anyway. This causes us great concern. For example, there is a specific example in the workbook where, if you are already in an area where forestry is fairly widely practised—say you had a farm near Tumut and you thought that it was reasonably likely that forestry might actually be practised on that farm—that particular plantation under this scenario would not be acceptable.

If work was already going on, for example, a landcare program, and it was likely that you would be continuing to undertake that landcare work, that could not count for sequestration purposes because it would be fairly likely that it was going to continue. I

can see where the additionality clause has come from, but I think it effectively penalises people who have been in the business of forestry, landcare or bushcare, or whatever program you like to think of, because they cannot count the carbon they are going to sequester, and it rewards those people who have not been in that program. So whilst there might be good underlying reasons for putting it in, from a government point of view, I think it really sends a very unsatisfactory message.

The two sinks that I am currently verifying—or I was on Thursday and Friday—in my view, both have sufficient documentation to say that they were additional actions. So they are covered. One of our group, for example, is Timber 2000, which is a group of farmers in western Victoria.

Mr BILLSON—A great bunch of people!

Mr Borough—A terrific bunch of guys, but the problem is that all their trees are basically put in for making money—it is a terrible thing, I know. Despite the fact that they might meet every other criteria, you would have to reject them on the additionality clause in terms of signing a greenhouse challenge agreement. That might be fine for the Greenhouse Challenge Office, but in terms of what comes out of your findings it is a very important issue. I think it should be argued both within Australia and internationally that this additionality really needs thinking through well. I do not think you should reward people who have never done anything and penalise people who have done something. That was the one thing that arose from our submission which we have not brought up before.

CHAIR—Can I get one thing clear to start with. You did mention about raising capital, et cetera. Is your company involved in growing trees or are you coordinating people who are growing trees?

Mr Collins—I do not know whether it went through to the keeper—I should not presume—but Max used the dreaded 'F' word, 'fungibility'. The premise is—I will use stock exchange terminology, if you will forgive me—if you buy shares in BHP from me, you actually do not get my shares. There is a process where they go through a pool, and you have shares. What we feel is most important is that the buyer, the emitter, is buying carbon. He is actually not buying a specific plot of blue gums anywhere. Our role is to ensure that at any time that contract of purchase of carbon, which is what the emitter is interested in, is satisfied and is viable. We would represent growers of trees and we would have a contract with a grower of trees.

CHAIR—In a brokering role.

Mr Collins—Yes.

CHAIR—The Sydney Futures Exchange have said that they believe they could certainly run an emissions trading scheme. You would sit within that, would you?

Mr Collins—Yes, that would be quite a likely outcome.

CHAIR—As an economic position, obviously trees in their fairly early stages sequester quite a bit of carbon in up to 30 years or so. Therefore, it would be a very good economic proposition to that stage but what about after that?

Mr Borough—If we are talking $10 or $15 per tonne of carbon—let's hope more—talking about that sort of money, it certainly is a major boost to tree growing. I do not think there is any doubt about that. At $5 is not a particular boost. Nevertheless, the point that Max made, and it is made in the submission, is that it is probably unlikely that at, say, $10 or $15, anybody would grow forests just for the carbon value alone.

CHAIR—If I sold those carbon shares up to that period of 30 years and then it would reduce as the amount of carbon being sequestered by the forest, I would have to put away that money and live off my assets from the money, would I? Where am I going to go to get income from then on?

Mr Borough—The point is, despite all the bad feelings, that the reality is exactly as you point out: carbon sequestration will reach a point where it is exactly balanced and nothing will happen. So there will be no actual net gain to society in keeping forests ad infinitum. You have to cut them down sooner or later. The issue that Snow Barlow raised is that there is really no mechanism for handling the products, whether they get put into tissue paper one day or they get burnt to generate fuel, whether they get put aside in a building or in fact, in the extreme, get put in a big hole and covered up.

Nevertheless, the methodology for handling that in the sinks workbook says that it is problem of the purchaser of the wood. So from a sequestration point of view, so far as we are concerned, all we are really worried about is what happens in the forest and how much is sequestered that year. So the day it is cut down, the day it is bought by BHP to do whatever they like with it, that is really their problem. From your perspective as a grower, you need to get it up to the maximum rate and fairly soon on cut it down and start the process again. That is the way you will get maximum sequestration into wood.

Mr Bourke—I know, as someone who is involved in the cotton industry, that rural people are quite comfortable with the notion of futures trading of commodities—you would know that very well. And I think people are comfortable with the notion of growing crops. We still have a mentality in Australia where we do not think of trees as crops, but they are crops. And we have to begin to look at them as another form of cropping. Futures trading in crops in Australia, particularly in the cotton industry, is something we are quite comfortable with, and you do your financial planning based on what you have sold downstream.

CHAIR—You are a fool if you do not buy futures. We have had evidence from

some of the private forests, particularly those who were encouraged by government taxation policies during the 1960s, and they are saying it was a spectacular failure. You would be arguing that they should be getting some benefits. Their trees are now 30 years old, I suppose, so they would have a diminished sequestration at this stage, but you would be arguing that they should get some benefits from that?

Mr Borough—I look at it from the view of the person on the ground who has to do the audits. That is my role.

CHAIR—I bought Kapunda when I was Minister for Forests, yes. They are arguing that they should get some benefit, but others say 1990—

Mr Borough—I think we are unlikely to change opinion on the 1990 date, but I think that whatever might have been sequestered by anything from 1990 really should be counted. For example, if those 30-year-old plantations have not been thinned and are basically in a steady state position they do not get anything. If something had been planted in 1988—like my trees, for example; there is a very good example from me—I cannot see any logical reason why my neighbour just over the road who planted his in 1990 should get all the benefit, but that I, who by sheer luck happened to have planted two years early, should not. So I would say that anything which is sequestered from the 1990 date should be counted. And we are certainly planning to implement our carbon trades on that basis. Unless we have direction to the contrary through legislation or whatever, we think that is a rational thing to do. Nevertheless, that is how we have interpreted it.

Mr Collins—So there is no benefit to the grower with 30-year-old trees.

Mr Borough—There would be little benefit.

Mr Collins—It is a matter of where you start the clock. It is always going to be contentious, but if 1990 is established then that is a workable hypothesis. Just to go back to your earlier question, I am not sure whether we fully answered it. We do not think it would be workable to give you a 30-year certificate. We believe that three years would be manageable for us in terms of our relationship with the grower. You could do it on an annual basis, but we have to ensure that the contract we have back to back with the emitter is sound and auditable. So it is going to be a trade-off. This has to be a low cost market. This cannot afford to be a very high cost market. The cost of the trading has to be absolutely the lowest possible so that the benefit goes to the two counterparts—the grower and the emitter. But I think that is right, isn't it, Chris? There are three areas. The benchmark that we are using is that every three years your trees will be measured so you get 10 measurements in the 30 years and the graph would go like this. We do not think the graph will actually fall straight down—

Mr Bourke—We think that is a bit of a problem. If you do what we say, you are not even counting the below ground section, so it will not fall off the edge like that as

quickly—it will keep ratcheting itself up so that it drops off and then comes back up.

Mr BILLSON—Your model relies on the sequestration value being an offset to an emission responsibility so that the responsibility really for verification is in both parties' interests. If you treated it as a commodity in its own right and created a credit that you could trade freely in the marketplace, then all of the verification requirements would rest with those undertaking the sequestration activity, whereas, as I understand your model, you are not suggesting it has a life of its own; you are suggesting the sequestration value is an offset against an emitter and therefore there is a shared responsibility for verification and the like. Is that right?

Mr Collins—I do not think so. They are quite different concepts. To simplify that, I think where we are coming from is that an emitter does not really want to put capital into buying land and growing trees; he really just wants a certificate of carbon sequestration. And where we stand in the middle is to ensure that that certificate is done. So he would have no knowledge of where the trees were in Australia: they could be Western Australian blue gums; they could be pines. Anyway, he would not need to know.

We have to recognise that the growers are going to be hit by floods and bushfires and often they cannot refuse to clear-fell with a market that we would be able to operate, he himself would have to buy carbon credits because he is committed to deliver them to the market and he would, in effect, trade out—I am sorry that I keep coming back to my background on this—which is actually an enormously effective way of maintaining this relationship without the emitter having to become a forester or the forester having to become a marketing guru to the emitters.

Mr BILLSON—But let us just be clear on this: under your model you are creating emissions capacities that stand in their own right as distinct from using sequestration measures as a deduction from the permit requirement that an emitter may have. For instance, Chris is running a power station and he has 10 megatons gushing out. Under your model he would still have to find 10 megaton of capacity and he would build that up by picking up your credits, whereas the alternative model is that Chris is gushing out 10 megatons, he has done a deal with some people in his area that gives him a two-megaton reduction, therefore his permit requirement is eight megaton on the marketplace. They are quite different concepts—

Mr Collins—They are two markets, almost—

Mr Bourke—He can then sell that—

Mr BILLSON—I understand that but I was just trying to be clear on whether you want a life of your own or whether you want the value that sequestration creates to be an offset to an emission responsibility.

Mr Borough—It does not have a value in this—

Mr BILLSON—That is right, unless you find a partner—

Mr Borough—So it cannot have a life of its own—it must be linked.

CHAIR—But this system is picking up the small people and saying—

Mr Borough—It would be nice if they did, but we would not be trying to pick up state forests or VPC or whatever, but there are a huge number of growers out there.

Mr BILLSON—Why do you feel that the public sector involvement is something that should be excluded? I would put it to you that the end game is trying to reduce global warming pressures, therefore, wherever the capital comes from should not matter. You could also argue, as I have, that having the Commonwealth putting more money in through Natural Heritage Trust programs where the landowner benefits from the improvement in the quality of their land, their productive rate, why should the taxpayer not gain the credit value if the taxpayer is putting the money in for vegetation programs?

Mr Bourke—I may have been a bit loose in the way I wrote that part of the submission, and I would like to explain what we had in mind. What had come to our attention in the weeks—and it was only a matter of weeks—prior to our making this submission was a number of steps that were being taken. A consultancy was advertised by the Commonwealth Department of the Environment, amongst others, which was seeking to understand how the NHT process might proceed.

We felt that in a climate where, hopefully, although it is moving terribly slowly, the Hilmer reforms in the forestry industry, which are grinding mightily slowly except in Victoria, would lead to two classes of players. Clearly, if there were some people getting their capital for free—and we do see, in association with our colleagues in Timber 2000, for example, although CO_2 Forest Sinks would not be a banker itself—that there is the possibility that you will be able to draw more capital into investing in farm forestry. You are not going to be able to do that if you are competing with someone who is getting free capital—that is an NHT grant—as they start off with a big advantage compared with the person who has to pay for the capital.

Mr BILLSON—But in that model, the provider of the equity is the taxpayer, therefore the taxpayer might pay. I was the natural resources minister's adviser when we put in the forestry rights laws in Victoria where you could separate ownership of the land from the crop. There is an argument that says that someone could own the land, the investor could invest in the crop—in this case the trees—and someone else could own the sequestration value. If you adopt that model further, it is perfectly acceptable for the taxpayer, where the taxpayer has put the capital forward, to own the crop and arguably the sequestration value, and the property owner gets the advantage of improved land produc-

tivity and turning around land degradation issues. Surely that is a model entirely consistent with what you are advocating? It should not distort the market too greatly.

Mr Borough—My view, which might differ from Max's, is that you are correct as long as the taxpayer retains the credit, not the land-holder.

Mr BILLSON—That is right. Otherwise, the windfall gain goes to the land-holder.

Mr Bourke—I guess at the time we wrote this, though, we were aware of certain long-term deals that have been done with public forestry, for instance, which have hugely reduced the value to the taxpayer. They are not returns coming back to the taxpayer; they are coming back to some individuals who have managed to make those very good deals. As a taxpayer myself, I am very comfortable with the idea of earning a rate of return, but there needs to be some mechanism that levels out that playing field and does not mean that there is one class of sellers of carbon sequestration who have got free capital and another class who are paying for capital.

Mr BILLSON—On the same subject though, if we were to go down the sequestration path, the value of putting in a plantation on already cleared land surely must exceed the value of clearing what some might argue was lower value indigenous vegetation and then replacing it with a monoculture through a forestry. You would be hopefully talking about the net gain as what is traded.

Mr Borough—The way that is handled is that, if you were clearing scrub or something, you are supposed to account for that as a debit against the project. It is pretty simple.

Mr BILLSON—It is the only really good thing anyone has ever found to say about woody weeds, isn't it? They are having a sort of rebirth.

Mr Bourke—From my own point of view, one of the initiators of this concept was that low value pastoral areas—like the highlands of parts of the catchment of the Lachlan and Macquarie rivers—are very high levels of emitters of salt into the river systems of those rivers and there are very low value grazing returns from these areas. You have low returns from either cattle or sheep grazing, high emission of salt and reasonably good rainfall.

CHAIR—But the highest quality merino wool in the world.

Mr Bourke—But also big salt problems around Boorowa and places like that which I am thinking of, which is adding to the problems downstream. What is it that you can do that makes farm forestry profitable to try to stop that, at least within certain parts of those areas? I do not mean totally. I am not talking about locking all of Boorowa shire for trees. It may be possible to make farm forestry profitable, which it is not at the

moment.

Mr BILLSON—To make your model work, though, you would be arguing that we need to negotiate out of the Kyoto framework opportunities like the south-eastern US energy producer which has bought an existing Costa Rican forest and, because that is outside Annex 1, has claimed that as a credit. There is no net gain to the planet on that but, if that goes on, that is going to significantly devalue the sorts of models that you are operating under.

Mr McDOUGALL—I want to change the focus. Whenever we hear about these sinks, we are always talking about planting trees for timber. I could imagine in a marketing sense that, if we take to the extreme the sink idea and forestry for timber, you could have some real changing outcomes in the timber industry in relation to values of product, even to the point where you end up with an oversupply in the marketplace. When we have listened to what the manufacturers want—as I have said here repeatedly—all they want is to have sinks. That is the easiest, cheapest and quickest trading mechanism. As Mr Collins said only too rightly, once they get that bit of paper in their hand, they do not care where the forest is, what it is doing and what it is achieving. So I have got a bother in my mind. Technically, I am no forester. Obviously, the take-up of carbon dioxide by forests is high. How much difference is there between a forest of timber and a forest of macadamia nuts? Do we know?

Mr Borough—I think we could have a pretty reasonable guess at that. Basically, the main sink is in the stem wood. There is some in the branches, the roots and so on, obviously, but the main sink is in the stem wood. So in a macadamia, you have a lot of light in between every individual tree and a proportion going to the stem wood and so on. So you might be producing five tonnes of carbon per hectare per year from an intensively managed forest, whereas the macadamia might be producing a quarter of a tonne. I do not know the exact numbers, but it would be of that sort of order.

Mr McDOUGALL—Should we exclude those other market products from this? That is what I am really getting at.

Mr Borough—No, I think any product should be considered.

Mr McDOUGALL—What I get back to is that, frankly, if you take some of the land which people would like to reforest, the timber that would come out of it would be pretty useless and worthless and it would be lucky if it grew anyway. But that same land may produce an alternative crop from a woody tree, even though it would be smaller in diameter, and go towards productivity of another product that comes off that tree. Therefore, you have another marketplace.

I would like to see the debate broadened a bit in relation to sinks. It has been said to me that, in parts of Western Australia, once you cut down the original tree—that is,

what is there in its current form—you will not grow that type of tree back anyway because the soil is not good enough to do it. What are you going to do? Are you going to say, 'That land is therefore no good in the future and, even if you grow it back, you are not going to get any value as a sink.' What I am trying to do is get a value because I am attracted to the market, but I would hate to see the market limited simply to what could be a single market that ends up getting devalued because of oversupply, without the demand to make it commercially viable.

Mr Borough—I think you have hit on quite a useful point there in that the potential wood produced is vast. I have often tried to reason that through and, in terms of today's markets, I think what you are saying is 100 per cent true. What we are trying to achieve in the whole exercise, I would have thought, is to have less reliance on fossil fuels and greater reliance on presumably nuclear energy, solar energy, wind or biofuels which are actually produced above the ground.

Let us assume that the price of diesel was not 74c a litre but $3 or $10 a litre, then obviously the fuel grown above ground would be the very economically attractive item. I think ultimately mankind probably has to start producing a lot of their fuels above ground. They should use whatever fuel they do most efficiently, but produce a lot of it above ground. If you are going to produce this vast amount of wood on often fairly poor sites, the only end use for it is going to be for biofuels. Quite clearly, we are not going to suddenly magically take up all this wood in the existing markets. If you look at these last few months in Australia, we are being inundated with wood from New Zealand which used to be going to Korea. I have just done some price reviews and it is frightening what is actually happening.

CHAIR—So what you are saying is that, instead of adding to the carbon dioxide in the atmosphere, you are recycling the carbon dioxide.

Mr Borough—Exactly. If I took a 100-year view, I think that is what we would have to as a species really start doing. That is where I see all these discussions about in the long term.

Mr Bourke—Earlier, Mr McDougall asked a question of a witness which I would like to add to and which follows on from your question. Your question was: does doing this deter people from doing something else? I do not think so. What this sets up is the price at which it is efficient to do something else. If we had a trading system in CO_2, we would know what the price of running solar energy was as an alternative. We would know what the price of running biomass fuels were.

We know in western New South Wales that the cotton industry alone could produce enough biomass from the trash after cotton harvesting to produce about a quarter of the state's diesohol, if the price of diesel went up by something like 30c or 40c a litre. We know there is a benchmark. There is a cost to the community obviously of doing that,

but you can begin to compute once you start doing this what the alternative costs are. The thrust of your question, as I understood it, was whether having sinks would deter people from doing something else. No, I suspect it will make them do something else. We have had serious discussions with a very large oil producer which is very seriously looking at ways, as it has to, of driving other systems other than oil production. It knows it has to come in with other systems not too far down the track and this might give it some breathing space.

CHAIR—So they are broadening their base.

Mr McDOUGALL—Let us take the power industry as a classic example. They are burning fossil fuel at the moment at a great rate of knots and buy heaps of permits to be able to do it. They get some sinks indirectly because they get that permit value. The industry changes and starts producing most of the power from natural gas. The emission is far less. They have all these permits and all these credits stacked up, which are not needed.

Mr Bourke—They can sell them.

Mr McDOUGALL—What happens to the market?

Mr Collins—It is a wonderful answer when someone asks Mr Morgan, 'Why is the price going down?' and he says, 'More sellers than buyers, son.' What a lovely problem!

Mr Bourke—Isn't that what the whole process is about?

Mr McDOUGALL—I would hope that is what the process is about, but I have these doubts in my mind about the process achieving that when it seems to be all about the sink is the easy way out.

Mr Bourke—I have seen some wild figures quoted, but we think there might be two million hectares that are viable in Australia. That is all. That is not going to consume more than about a third of transport energies. We are not going to be able to solve that with sinks, not in Australia. We will not even vaguely get near it.

Mr Borough—If you take the world scene, you would need more than the surface area of Australia.

CHAIR—In many ways you appear to be ahead of the game. You believe in your mind that the world is going to go down this track of tradeable emissions. Therefore, you are out to develop or set in place a market not just in Australia but a market that can be accessed on the international trading scene.

Mr Collins—A market is really where two people decide they want to talk about a product. The larger it gets the more it depends upon the regulatory regime within it to work. We need that in Australia. There was never any question about needing the ground rules to be set. When it gets to an international market, it will then be dependent upon the ground rules and the regulator. I know what the ASX is going through at the moment trying to find what happens to global trading. It is happening and the regulators are running way behind because the markets are now playing games of regulatory arbitrage.

We think that we have to get set early. When there is an international regime and ground rules come out of intergovernment meetings, then it should slot straight in. The product is common. The science is international because it is part of an international organisation. It is going to be measuring carbon sequestration around the world to this industry. It appears that the local and international scene will have to mesh quite readily, because the atomic components have got to be common.

Mr Bourke—There is also a reason why, I think, Australia should be innovative and quick into this. We are only going to be a small player on the sink side of the game, but we could, if we were clever, be quite a big player on the trading side of the game. I think that would be a nice thing to imagine that we could do. Personally, I would really like to see us drive some money back into rural Australia to make it absolutely clear that there are profits in growing other crops, other than sheep and cattle, that might well lift the standard of living in a lot of those declining communities.

Mr Collins—Also change the cycles. One of the things that is common to this enterprise is that the cycles still live. What we always tried to do in the stock market was think of some way that we could trade come the 'slight corrections'. Everybody else falls out of bed, so you trade bonds.

CHAIR—We should go back to steam using forestry as a fuel.

Mr Bourke—I think it is inevitable.

Mr Collins—I love steam trains.

Mr BILLSON—Clearly, the earlier this regime is set up the better for your interests. Does it follow then that the earlier the scheme is set up and the sooner allocations are made in the domestic marketplace, whether it is grandmothering or grandfathering, the better for you guys? Along those same lines, would you support an early allocation of emission permits based on 1990 emissions that discount themselves towards 2008 so that we meet our international obligations, but in that act of discounting start sending early signals to emitters that they need to start talking to people like yourselves to make that transition to 2008?

Mr Bourke—Whether either a tax based or a credit based system, whatever

regulatory system, might emerge, it would clearly drive a formal market into place. We believe there is right now a scope for an informal market. That is why we have set up business because we think we will see ourselves doing trades in the near future on, as Rory calls it, an over-the-counter basis. Clearly, if there is either a tax or a credit based system forced on people, then that will drive a formal market very quickly.

Mr BILLSON—As policy makers, we could argue that it would soften the landing of 2008. The last thing you want is a market intervention of biblical proportions.

Mr Collins—That is a nightmare of any market.

Mr BILLSON—That is right. Mr Collins, in your experience, you would be arguing for a very open market. We have had evidence put to us that the likes of a global warming version of George Soros intervening and going along on these things could really cause some problems. Conversely, some environment movements say, 'The more in the better.' If you took the permits out of the system, effectively, you would bring about positive climate change action quicker. Is that your view? Would you leave it open and let everyone have a run?

Mr Collins—I am tempted to note that George Soros has been on a road to Damascus.

Mr BILLSON—That is because he is cashing up to buy some more permits.

Mr Collins—And he is not quite so gung-ho on the purity of market rules.

Mr BILLSON—He is into currency transaction. You have a new market now, Mr Collins.

Mr Collins—He is getting a conscience perhaps. Maybe we all are. It comes down to a question of price discovery. Price discovery has to be established between the buyer and seller to try to avoid a reasonable alternative to a level playing field. I think that is what Max harked back to. I took your point there, and it is a very good one. I look upon it as outsourcing. The landowner gets value from just having the land but does not want to do anything else about it. All this sophistication is an evolution of the market, which is really a very good thing. But, in principle, it has to be an open market. The more regulation and conditions come in the less you will get in a market. It just dies. Even though with the golden mafia, as the bond traders are known, or lemmings I think at one stage, at the end of the day, the market is a free force because it is there to establish a price between the buyer and the seller.

Mr BILLSON—I see an enormously confounding market interplay between commodity trading and this new commodity, particularly if you are Alcoa competing against a non-Annex 1 aluminium producer where you have Kyoto compliance costs

factored into your production, and then you get stuff dumped on you from the developing world that does not have to worry about that. Without using the 'T' word, how does one seek to maintain fairness in the trading regime where you have what could be an enormously confounding impact from the outcome of Kyoto?

Mr Collins—That is where 20-year contracts meet a futures market. I do not have the answer. Whatever the answer is, I cannot believe that it would in any way damage the concept of having a market. I know that is a bit of a cop-out.

Mr Bourke—That is why over-the-counter trading, one-on-one trading, which is possible in the very near future, as we know, will begin an informal market just as it did with cattle and sheep before futures. It may well be that that sits around for years as a trading system that is just a purely buyer-seller thing, as it did in the livestock industry.

Mr BILLSON—But how would the market react if the outcome from Buenos Aires was non-Annex 1 countries bringing product into the Kyoto climate controlled world? You would need to add a climate compliance certificate to their products, which might be the importer having to buy credits to bring in aluminium that is coming in from the non-Kyoto world. How would the market react to that; and would that make an opt-in option for the developing world more attractive so that we had a fairly homogenous trading environment on a broader scale around the globe?

Mr Bourke—It could well be where the WTO or somebody like that has to come in and play a role like that.

Mr BILLSON—Someone will have to at some stage.

Mr Collins—Given the weight of nations that will be ensuring compliance at a cost, there would surely have to be some balancing act which may be in the form of a subsidy. Rather than have it distort the market in a way that is damaging to the fundamental objective of lowering greenhouse gases, you would have a counterbalancing thing to say, 'You don't actually get this market'—

Mr BILLSON—That leads me to one final question: is it a new market for you where exporters of Australian made product into non-Annex 1 countries can strip away their greenhouse credits and you can then trade with importers bringing product in the other way? It is just like quarantine but it is climate treatment on the way in and out.

Mr Bourke—I must say we have not thought of that.

Mr Collins—They are struggling with an over-the-counter market, and you have got a very sophisticated three-tier market there—

Mr BILLSON—I mean, WTO and non-tariff trade barriers are all the go, I cannot

help but see this becoming the biggest impact on international trade ever in the history of mankind. The way I feel about it is that the potential to distort markets is enormous.

CHAIR—Do not underestimate the great innovators from America.

Mr BILLSON—But I think they will be leading the charge for the sorts of things I am talking about, otherwise their domestic economy will go feral, I would say.

Mr Collins—The earlier we get to learn how to operate a market that benefits the people that we can collect who want the benefit, the better trained we will be.

CHAIR—We are going to have to leave it at that. Thank you very much for your evidence. It was very interesting. I dare say that you will certainly be in there at the start of the game anyway. I have a housekeeping matter: it is proposed that a document presented by the Bureau of Resource Sciences comprising a graph and maps be accepted as exhibit No. 6. There being no objection, it is so ordered.

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

That, pursuant to the power conferred by paragraph (o) of standing order 28B, this committee authorises publication of the evidence given before it at public hearing this day.

Committee adjourned at 12.13 p.m.