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JOINT STANDING COMMITTEE ON TREATIES

Reference: The Kyoto Protocol

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JOINT COMMITTEE ON TREATIES

Wednesday, 27 September 2000

Members: Mr Andrew Thomson (*Chair*), Senator Cooney (*Deputy Chair*), Senators Bartlett, Coonan, Ludwig, Mason, Schacht and Tchen and Mr Adams, Mr Baird, Mr Bartlett, Mr Byrne, Mrs Elson, Mr Hardgrave, Mrs De-Anne Kelly and Mr Wilkie

Senators and members in attendance: Senators Bartlett, Cooney, Ludwig, Mason and Tchen and Mr Byrne, Mrs De-Anne Kelly, Mr Thomson and Mr Wilkie

Terms of reference for the inquiry:

- The implications for Australia of proceeding or not proceeding to ratify the Kyoto Protocol and meeting its target emissions levels by 2008 with regard to anticipated and/or predicted economic, environmental and social outcomes both nationally and in specific regional areas.
- The veracity of conflicting current scientific theories on global warming and any solutions proposed for it.
- What definitions and criteria Australia should develop and actively pursue in its national interest with regard to:
 - grandfathering,
 - trading credits,
 - carbon credits,
 - sequestration,
 - revegetation,
 - land management, and
 - definitions (eg “forest”).
- The economic, environmental and social implications of a punitive approach to any domestic regulation of industry including such proposals as a carbon tax and an incentive-based approach.

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Committee met at 9.13 a.m.**ANDREWS, Ms Gwenyth Jane, Chief Executive, Australian Greenhouse Office****CARRUTHERS, Mr Ian, Senior Executive Manager, Greenhouse Policy Group, Australian Greenhouse Office****HARRISON, Dr David, Special Adviser, Emissions Trading Unit, Australian Greenhouse Office****HILLMAN, Mr Ralph, Ambassador for the Environment, Department of Foreign Affairs and Trade****IRWIN, Mr Stephen Brent, General Manager, Greenhouse Response Branch, Energy and Environment Division, Department of Industry, Science and Resources****MITCHELL, Dr Christopher David, Key Account Manager—Greenhouse, Group Manager, Greenhouse Mitigation, Commonwealth Scientific and Industrial Research Organisation**

CHAIR—I welcome witnesses, members of the public, media and so forth to our second hearing on the Kyoto Protocol on greenhouse emissions. We are going to undertake a number of hearings across Australia, and we have already held one in Melbourne. Today we are going to take evidence from various organisations and some individuals that represent a range of views on this issue.

I welcome representatives from various departments of the Commonwealth. Although we do not normally require evidence to be given on oath, I have to formally state that these are proceedings of the parliament as if they were taking place in the House of Representatives or Senate, so any false or misleading evidence is a very serious matter and may be regarded as a contempt of parliament. This morning we propose to have introductory remarks and then questions from members of the committee, and we will begin with Ambassador Hillman, then AGO representatives and then CSIRO.

Mr Hillman—As Ambassador for the Environment, I lead at official level the Australian delegation to climate change negotiations, but that effort is very much a team effort. The delegation includes officials from Environment Australia, the Australian Greenhouse Office, ABARE, AFFA, the Department of Industry, Science and Resources, the Bureau of Meteorology and an industry representative. Our written submission to this inquiry focused mainly on the first dot point in the terms of reference concerning questions surrounding ratification. I thought this morning in my introductory remarks I would try to draw out to members of the committee the key issues in the negotiations and the relevance of those issues to an ultimate Australian decision on ratification of the Kyoto Protocol.

The Kyoto Protocol was adopted by the third conference of the parties of the UNFCCC in December 1997 and set binding targets for 39 developed countries and economies in transition to achieve an overall reduction of five per cent in greenhouse gas emissions compared with 1990 by 2008 to 2012. This represents a reduction of about 30 per cent below business as usual. The outcome at Kyoto was a major achievement for Australia. The concept of differentiation

was accepted, sinks were included and we achieved a plus eight per cent target, which recognised Australia's particular economic circumstances. Nonetheless, that target amounts to a 30 per cent reduction below business as usual in line with other developed economies. Entry into force of the Kyoto Protocol would be the beginning of a serious attempt to address climate change and would impose substantial costs and structural change on developed economies. It is expected that it would cost Australia between 0.5 and one per cent of GDP in 2010.

Kyoto was a landmark event, but it left a number of key issues unresolved which will need to be settled before major players, including Australia, consider ratification and bringing the Kyoto Protocol into force. In simple language, the key issues are five: one, the extent to which developed countries should be allowed to meet their targets through emissions trading and by undertaking emissions reduction projects in developing countries as distinct from domestic measures; two, the extent to which sinks—that is, forestry and land use management—should contribute to meeting developed countries' targets; three, what compliance system should apply and what should be the consequences of non-compliance; four, the extent to which developed countries need to respond to developing country demands for transfers of resources and technology in the context of climate change; and, five, how and when developing countries should take on targets under the protocol. Until these issues are settled, it will not be possible accurately to forecast the economic, social, regional and environmental implications for Australia of the implementation of the Kyoto Protocol. The outcomes on sinks and emissions trading, for example, would have major implications for the global price of carbon and the cost to Australia of meeting its target. The outcome on developing country targets will be important to the competitiveness of some Australian industries.

Negotiating parties agreed at the fourth conference of the parties in Buenos Aires in November 1998 to reach decisions on all but the last of the five issues I have just mentioned at COP6 in The Hague in November 2000. COP6 is thus seen as a major staging point on the path to entry into force of the Kyoto Protocol. No agreed time process or time frame exists for addressing the fifth question—that of developing country commitments or targets. However, the United States and others, including Australia, are looking for a path forward on this issue as an outcome of COP6 in The Hague.

I will now go back to those five issues and look at the significance of each of them—in particular for Australia—and where the major negotiating groups stand on them. On the so-called flexibility mechanisms—that is, emissions trading, the clean development mechanism and joint implementation—these mechanisms hold the prospect of substantially reducing the cost of implementing Kyoto compared with a situation where each country met its target by domestic measures alone. ABARE modelling suggests that emissions trading alone would reduce the global cost of meeting Kyoto targets by 80 per cent and for Australia by 20 per cent.

The clean development mechanism is significant—this is the mechanism whereby developed countries can do projects in developing countries and then bring the credits home to meet their obligations under the treaty—because it will involve developing countries in greenhouse action and give developed countries access to low-cost abatement opportunities in developing countries, thereby lowering the global cost of reaching their Kyoto targets. It will also lead to substantial flows of investment and technology to developing countries. This latter prospect has softened the attitude of some of the developing countries to the flexibility mechanisms in the negotiations and to progress in the negotiations more generally.

The European Union, with support from some of the developing countries and most green NGOs, has sought to limit or cap the extent to which emissions trading and the clean development mechanism can be used to achieve developed country targets. They argue that the United States will avoid substantial emission reductions at home by purchasing Russian emission credits arising from the collapse of the Russian economy. The EU is concerned that this could substantially reduce the cost to the United States of meeting its Kyoto target. This would undermine the competitive advantage which the EU expects from the bubble arrangements it negotiated for itself at Kyoto and its anticipated access to credits from potential new EU members—Poland, Hungary and the Czech Republic. This position on capping is also strongly driven by green NGOs and green parties within individual EU member states. Australia, with other members of its negotiating group in the negotiations—that is, the umbrella group which comprises the United States, Japan, Canada, Russia, the Ukraine, New Zealand, Norway, Iceland and Australia—is committed to the uncapped free use of emissions trading and the other flexibility mechanisms.

Let me turn briefly to sinks. There are others in the room here who can elaborate at length on this question. The negotiations on sinks only really got started following the release of a major scientific report via the Intergovernmental Panel on Climate Change in May. Suffice it to say that the EU and some developing countries are trying to limit the extent to which sinks can be used to meet targets. Sinks are of critical importance to Australia. Definitions and rules to be adopted will impact on the size of our abatement task as well as the cost. This will be a key issue for Australia at the sixth conference of the parties in The Hague in November.

The shape and nature of the protocols compliance system was an issue left undetermined at Kyoto. A compliance system is needed to help parties comply with their protocol emission abatement targets and to sanction those parties that fail to meet their targets. Parties are currently working towards agreement on the operation of a compliance system at the sixth conference of the parties. An outcome on this issue will be important to most industrialised countries' ratification decisions.

One of the most difficult issues for parties to agree on is likely to be the consequences that would be invoked if a party failed to meet its target. Current proposals range from facilitative means designed to help parties overcome the implementation problems through to enforcement or hard measures such as financial penalties or removal of access to emissions trading. Australia has argued that a strong facilitative component is important to achieving implementation of parties' commitments and that consequences of non-compliance should assist a party to improve its performance rather than to impose penalties.

On the questions of interest to developing countries in this negotiation, developing countries will be seeking outcomes on a number of issues at COP6 involving financial and technology flows as part of a package of decisions on the issues I have just outlined. These include funding for adaptation to climate change, particularly for small island states and least developed countries, and for building institutional capacity to deal with greenhouse. They also want technology transfer beyond what will come through the clean development mechanism. OPEC countries are pressing for compensation for economic loss they might suffer as a result of any fall in oil prices arising from the emission abatement policies of the developed economies.

The question of developing countries taking on targets, which is the last of the issues I mentioned, is probably the most difficult of all, yet it is central to ratification by the United States and some other countries, including Australia. The United States made it clear in 1997 that it would not ratify the Kyoto Protocol unless developing countries took on binding targets. The US administration has subsequently interpreted this Senate view as ‘meaningful participation’ by developing countries, which is a slightly softer concept. G77, particularly China, India and Brazil, strongly resists any suggestion that they should take on binding targets. They were successful at Kyoto in having a draft article on voluntary targets removed from the text. A strong United States push to address this issue in the formal negotiations at COP4 in Buenos Aires in 1998 led to the developing countries blocking substantive progress on all issues. Following COP4 in Buenos Aires, the United States has focused on bilateral contacts, including with India, China and Brazil, and an informal multilateral dialogue, in which Australia participates, to take this issue forward. Argentina at COP5 said that it was working towards a voluntary target; some others may follow.

For the European Union, Japan, New Zealand, Norway and the economies in transition, the question of developing country targets or commitments is not a ratification issue. A reasonable package of decisions at COP6 in The Hague, covering the mechanisms, sinks and compliance, would be sufficient for them to begin their ratification processes. These countries have taken on the aspirational target of entry into force of the protocol by 2002—that is, Rio plus 10. There must remain a question, however, over whether major economies in the EU would finalise their ratification processes in advance of the United States. The competitiveness implications for Europe and Japan of having the protocol enter into force with the United States outside would be significant. Thank you.

CHAIR—Thank you. That was quite clear.

Senator BARTLETT—Firstly, I would like to clarify whether you know if any other annex 1 countries are close to ratifying the Kyoto Protocol and, if so, what stage various ones are at.

Mr Hillman—Estonia, one of the Baltic States, which is minute as an economy and as an emitter, actually ratified it in August. The French have virtually got their ratification processes to the point where they can just sign on the dotted line but, of course, they will move with the EU. No other annex 1 country or developed country has moved to ratification.

Senator BARTLETT—It has been stated a number of times, predominantly in the media, that the position of the Australian government is basically not to ratify until the US does. Is that a formal position, or is it just an approximation?

Mr Hillman—The Australian government’s position on ratification is really set out in Senator Hill’s statement at the time of signature of the protocol in April 1998 whereby, before considering ratification, we would need to address a number of issues, including sinks, the flexibility mechanisms and the question of developing country participation. Of course, in any treaty ratification process the government looks very closely at who else is ratifying and where they are at in their ratification processes.

Senator BARTLETT—Is it feasible that Australia would ratify even if the US did not?

Mr Hillman—That would be a decision for the government but it is theoretically possible.

Senator BARTLETT—In terms of the treaty aspect and the extent to which the protocol is binding, you have stated in your submission that it will become legally binding on those countries once the requirements for entry into force have been met—the various percentages of countries that sign up. If we were to ratify, it does not become legally binding on us until the protocol as a whole enters into force; is that right?

Mr Hillman—Correct.

Senator BARTLETT—Even after that stage—which is still a fair way off, I presume—if we do not then meet the target, according to your submission a failure to meet the target would be a breach of international treaty obligation; that obligation only starts once the whole thing enters into force; and the consequences still are not there. According to your submission, the protocol provides that they can only be adopted by amendment of the protocol which we have to agree to individually; is that correct?

Mr Hillman—That is still an issue in the negotiations—whether or not the consequences for non-compliance will be binding. That issue itself is under negotiation. There are a number of parties who say that any consequences should be binding and therefore, as article 18 states, the protocol will need to be amended. Others say that the consequences need not be binding and no amendment to the protocol is necessary. Some countries, particularly Japan but also Australia, have hesitations about a process of amending the protocol because it could open up issues other than just the question of compliance.

Senator BARTLETT—Can I clarify that because your submission states that the protocol provides that binding consequences may only be adopted by amendment of the protocol, which means that presumably we would have to add an amendment to it detailing the consequences of non-compliance.

Mr Hillman—Yes.

Senator BARTLETT—Then it states that Australia will not be subject to any amendment such as that to introduce binding consequences unless it separately ratified that amendment.

Mr Hillman—Correct.

Senator BARTLETT—I take that to mean that we would have to agree to that amendment before we would be subject to its consequences; is that correct?

Mr Hillman—Correct.

Senator TCHEN—Can you explain to me why the issue of sinks is particularly critical to Australia?

Mr Hillman—I could, Senator, but I would ask our sink experts to lead on that, if I may.

Senator TCHEN—In that case I will direct the question to Mr Carruthers when his turn comes. I will rephrase my question, Ambassador. Is any other country equally concerned about the issue of sinks?

Mr Hillman—Yes. A number of major annex 1 players are very concerned about the issue of sinks: Australia, Canada, the United States, Japan and some countries within the EU, because they see sinks as playing a major role in meeting their target commitments. We can go into the complexities of it later but different countries are adopting different approaches to sinks in the negotiation. A number, including Australia, have indicated that this is in fact a ratification issue for us to get the right outcome on sinks which lets us use them to meet our target.

Senator TCHEN—I understand that the Kyoto Protocol only refers, in terms of sinks, to afforestation. When we are talking about sinks, Australia seems to be looking at a more flexible approach to it—an alternative form of sinks. Are the other countries in the same situation or are they referring strictly to the Kyoto provision?

Mr Hillman—Article 3.3 provides for afforestation and deforestation. Article 3.4 allows for negotiation on additional sink activities. It is the proposals for those activities which are forming the focus of the negotiation. Australia has made a proposal; the United States has made a slightly different proposal, as have the Canadians and Japanese. It is perfectly legitimate within the wording of the Kyoto Protocol to be making those proposals at this time with a view to implementing what is agreed in the first commitment period.

Senator MASON—I have two questions, one relating to the consequences for Australia if we do not ratify the protocol and the other relating to what is perhaps the most important issue—or you said it was—and that is developing countries and emission standards in relation to their industrial infrastructure. In relation to whether Australia ratifies the protocol, it is obviously a hypothetical question, but what are the disadvantages for Australia if we do not ratify the protocol? Some of the submissions suggest that the implications could be trade sanctions, perhaps, and our becoming an international pariah, in two separate circumstances—firstly, where the United States does ratify the Kyoto Protocol and, secondly, where it does not.

Mr Hillman—It is conceivable that the protocol could enter into force without the United States, Australia or Canada ratifying. I think there is a big question over whether that would ever happen, because the Europeans and Japanese are acutely conscious of the competitiveness implications of this protocol. I think it is a very unlikely scenario that this would happen. What you are more likely to see is enormous international pressure building on the United States and us to ratify, but with the Europeans actually hanging back from going over the edge, unless they are convinced we are ultimately going to go forward. But let us imagine a scenario in which it does enter into force and the United States, Australia and Canada have not ratified. That would be a more comfortable position for us than a situation in which we alone had not ratified.

In international law, there is no sanction available to bring against Australia, no legal sanction through the WTO or anywhere else, in the case that we stood alone and did not ratify. Of course, Australia is participating in an ongoing global negotiation over a whole range of issues that affect our lives—trade, the economy and other aspects—and you could imagine that, if we had stood aside on a major issue like this, it would make our negotiating stance in that broad negotiation rather more difficult.

Senator MASON—I suppose that begs the central question: what would the implications be for Australia if the United States did not ratify the protocol and we also held back? What would be the consequences for this country? On your evidence, that seems likely at the moment.

Mr Hillman—I would not say likely; it is a possibility. The consequences are that, as climate change is going to continue to exist as an international issue, there will be pressure on the United States and Australia to accommodate. If the United States and Australia have not ratified, obviously, we have not come up with an effective instrument to deal with global warming. There will have to be some sort of renegotiation, some sort of accommodation, because in order for this to work, everybody has to be involved, including, down the track, developing countries.

Senator MASON—Senator Bartlett has already asked you this, but should we wait until the United States ratifies?

Mr Hillman—That is a decision for ministers.

Senator MASON—Of course. Secondly, on issues relating to developing countries, in your submission at 1.5.3, you say:

Consequently, shifts in global trade and resource flows from developed countries towards developing countries may occur, as may changes in the production of greenhouse gas-intensive goods. This would undermine the environmental effectiveness of abatement action undertaken in accordance with the Protocol.

Because there is no agreed timetable for developing countries to assume their emission reduction commitments, your argument really is that developed countries could move offshore and do a lot of their heavy industry and so forth in developing countries, which would undermine the protocol. The obvious question is: what can we do about that? It potentially undermines the whole structure.

Mr Hillman—It undermines it for two reasons: the first is carbon leakage, which you have mentioned, and the second is that in about 10 years time emissions from developing countries are going to exceed OECD emissions. So unless we get these people on board, we are not going to be able to deal with global warming. This has been a constant issue throughout the negotiations. As I said, there was an article in the draft protocol at Kyoto concerning voluntary commitments which fell off the table in the end. Developing countries simply pushed it out as part of the price for their agreeing, I understand, to the package which came out of Kyoto. We, the Americans and others have been working with developing countries since then and within the negotiations to keep this subject on the table. Our expectation is that at COP6 in The Hague it will not be the focus of negotiations. It is one of the issues, and our objective and the United States' objective out of this negotiation at COP6 is to keep a pathway open in the negotiations to carry this negotiation on with a view to some sort of outcome at COP7. The fact is that, if the United States is going to ratify this protocol and be in a position to implement its obligations, it needs to ratify in about 2003, so we really need a decision on this developing country issue within about a year or a year and a half of COP6.

Senator MASON—I do not know a lot about these issues, but that is such a difficult problem because you have a situation where, firstly, developed countries do not want to lose the competitive edge, and, secondly, developing countries say, 'Historically, to put it bluntly, you've

stuffed up the environment. The West has taken advantage of it and now you want us to pay the price.' It is very difficult. I do not know how you solve that, but that is your job.

Mr Hillman—It is an extremely difficult subject, and ultimately we are going to have to continue with the persuasion but also with the political pressure. Part of the political pressure will be the fact that the ratification decision of the United States hinges on some sort of outcome on this issue. Some take the view that really it is probably better for developing countries to agree to some arrangement on commitments by them rather than let the Kyoto Protocol go under—that is, for environmental reasons, for some of the economic benefits they expect to receive from the protocol in the short to medium term and also because, if we all got back together and started this negotiation over again, it would have to be on the basis that they would be included with targets.

Senator MASON—I have one last question, and perhaps once again it is speculative. Do you think the United States will ratify the Kyoto Protocol without significant concessions for developing countries?

Mr Hillman—It is difficult to prejudge what the United States Senate will do. I think when confronted with a decision on ratification of the Kyoto Protocol, they will have two key issues in their minds: first, the cost of implementation and, second, what we have done about developing country targets. The cost will be very much influenced by the outcome of this meeting in The Hague where we talk about emissions trading, sinks, et cetera. That is going to have a substantial impact on cost. The better the cost package is, I think, politically the easier it is for the Senate to agree to something on developing country targets which are less than hard targets in the first or second commitment period, something more along the lines of meaningful participation, as President Clinton characterised their position.

Mrs DE-ANNE KELLY—Ambassador Hillman, I would like to go to the second dot point of our terms of reference—the veracity of current scientific theories. With respect to one of the other submissions given to us—I do not know whether you have been able to read other submissions made to the committee—I note that the National Association of Forest Industries quoted Dr James Hansen of the Goddard Institute for Space Studies at NASA as saying that the anthropogenic influence is offsetting a natural long-term cooling trend. Obviously, this is just one of many conflicting theories. Are all of those theories wrong?

Mr Hillman—I would not presume to comment on a scientific issue. I start from the basis that the government has accepted the science and I am here to lead the negotiating process on minimising the cost, basically, of implementing Kyoto. There are others in the room from CSIRO and AGO who could give you an expert opinion on that.

Mrs DE-ANNE KELLY—When you say the government has accepted that global warming is occurring, in what way has it done so?

Mr Hillman—I quote from the Prime Minister's 1997 statement, which you probably know quite well:

The world's climate scientists have provided us with a clear message—that the balance of evidence suggests humans are having a discernible influence on global climate.

What is required is sober, sensible but forward-looking action to reduce greenhouse gases and this is the approach my government will adopt.

That is really my starting point. Others could comment on the science.

Mrs DE-ANNE KELLY—With respect to page 12 of your submission, there is going to be agreement, I understand from 1.5.4, on outstanding issues at COP6. Bearing in mind that Australia obviously has not ratified, and nor has any other annex 1 country, how binding are those decisions that are reached? What I am asking you is: how do my constituents know what is being agreed to and when are they going to have an opportunity to have input?

Mr Hillman—Your constituents will have an opportunity to have an input at the ratification stage. If the government decides to move to ratification of the Kyoto Protocol, the whole package will be on the table for comment by stakeholders in Australia, and that is the text of the protocol itself as well as the text of the decisions adopted at COP6 and previous COPs.

Mrs DE-ANNE KELLY—So these decisions at COP6 can be altered; is that correct?

Mr Hillman—The decisions at COP6 could be altered by a subsequent unanimous decision of the COP.

Mrs DE-ANNE KELLY—My last question goes to point 1 of our terms of reference. You have spoken about the implications for Australia in very general terms. Could you outline for us—we have asked, both nationally and in specific regional areas, about the likely effect—who in Australia would be winners and who would be losers were we to ratify, having regard to the current matters being discussed?

Mr Hillman—The extent of the impact on the Australian economy of Kyoto will very much depend on what comes out of these meetings in The Hague now, and particularly in respect of sinks and the mechanisms, because those decisions will have a major impact on the global cost of carbon. Australia envisages that there will be a global emissions trading system and that carbon will have a uniform price.

Mrs DE-ANNE KELLY—What is the worst case scenario out of COP6 for Australia and what sectors would be disadvantaged? And what is your best case-scenario out of COP6?

Mr Hillman—The worst case scenario is one where we have very handicapped flexibility mechanisms, with emissions trading being virtually only a residual activity, where sink does not include our particular case in a helpful way. Of course, these are ratification decisions. It is difficult to see an Australian government wanting to ratify a Kyoto Protocol with those sorts of arrangements. So, in a way, the worst case scenario would probably not be imposed by the government on the Australian economy, because it would not ratify. Say we were to get a reasonable outcome at COP6, that we were to get something on developing country targets at COP7 and that the United States government and the Australian government ratify, we then have to implement the protocol. A global carbon market will emerge. We will know what a tonne of CO₂ costs and Dr Fisher from ABARE could very quickly tell us what the cost would be to the Australian economy of meeting its target in those circumstances. The distribution of the cost throughout the economy, though, would arise from the way we actually implemented

our obligation, and that is where the AGO can speak much more effectively than I can. There is a wide range of options available to the government in implementing its obligation, and those different options lead to different impacts on different parts of the community.

Senator COONEY—I am trying to get a sense of the negotiations. This is a treaty that talks about global warming and what effect it will have on the globe, but the discussions we as a nation are having seem to be directed more to the interest we have in how Australia itself is affected. That seems to me to bring a lot of tension to the situation. Is that how Australia is arguing this? Are we simply saying, ‘These are the interests we have. We understand the world is concerned about global warming but we really have to argue about how it is affecting us personally’? Is that how the negotiations are going forward? I get that impression from listening not only today but also at other hearings.

Mr Hillman—There is no doubt that the cost of participating in this process of addressing global warming is a key one for Australia, but it is in fact a key issue for all governments. That is not to say that we do not regard the environmental side as important. Obviously we have taken on a serious target—about 30 per cent below business as usual. That is a fairly serious environmental commitment.

Senator COONEY—But we have not taken that on; we have talked about it. That is what I am getting at.

Mr Hillman—We have signed the protocol and we are participating in negotiations that we intend should lead, ultimately, to its ratification. We are seriously committed to a successful outcome at COP6, and we are committed to achieving a Kyoto Protocol that can be ratified by Australia and others. In designing our approach, say, to the flexibility mechanisms and to sinks, environmental integrity is built into that, not just cost. Mr Carruthers can talk later about our approach to sinks but on the mechanisms, for example, the use of emissions trading and the clean development mechanisms have benefits not only in terms of reducing costs to Australia and other annex 1 countries; they also have substantial environmental benefits. By reducing the cost of carbon, you reduce carbon leakage and you thereby gain an environmental benefit that you would not gain if you took another route—for example, policies and measures that imposed a much higher cost for carbon. The higher the cost of carbon the more industry leaves annex 1 countries and goes off and situates itself in the developing world.

Senator COONEY—I still come back to this point: the original intention before Kyoto took place seemed to be, ‘We’ve got to reduce the greenhouse effect.’ That has been accepted; science, of course, seems to differ a bit. But taken as a proposition and accepting it, people then said, ‘What can the world do to save ourselves from this?’ But having got to Kyoto and having come away from it, the impression you get is that these commitments were not really all that serious; what we are going to do is carbon trade; what we have got to do is avoid as much as we can the impact it has on our country personally. If I can put it this way, there does not seem to be any great generosity of spirit in all this. What you have is a negotiation based on the proposition that we have got to get out of this as lightly as we can. It seems to me that that brings in an in-built conflict which I cannot see being resolved, having regard to the way in which negotiations are presently being conducted.

Mr Hillman—The government's focus has not been entirely on the negotiations, either. We do have a very extensive domestic program addressing greenhouse. In fact, it is one of the biggest programs per capita of any annex 1 countries. We are doing heaps more, for example, than countries like Sweden. We have set up the AGO; we have major voluntary programs with industry; we have introduced the two per cent renewables target. Gwen Andrews can talk about all these things. I think there has been an attempt in the international negotiations to present Australia as hardline and cost driven. But, if you look at the facts, our performance at home is very solid indeed. The arguments we are putting in the negotiations do have a good environmental basis, as well as addressing the question of cost. As I said in my introductory remarks, implementing Kyoto is going to impose structural change on the Australian economy. Everyone here knows what structural change involves: pain. I think it is a legitimate role for government to be seeking to minimise the pain that will be imposed on Australia by meeting its target under the protocol.

Senator COONEY—Of course that is right, but I get the sense—and I am trying to get from you whether I am right or wrong—that the concentration at the moment is not so much on the minimisation of greenhouse gas, but rather is aimed at making sure that we can get past the door with the least effort possible. In other words, it seems to me that this is not a treaty, a convention, or whatever you like to call it, that has been negotiated on the basis that we want to reduce greenhouse; it has been negotiated on the basis that we want to wear the suit, but we really do not want to do too much about it. I am trying to get from you whether that is how the negotiations are going.

Mr Hillman—The negotiations really are about implementing an agreed set of targets and the targets are all about reducing greenhouse emissions. It is a phase we are going through. I suppose you could say Kyoto was in many ways about how far we were prepared to go for the environment, because we were negotiating targets and we were also negotiating implementation. Now that the targets are agreed, the focus is very much on implementation. But, if this protocol is ratified and comes into force, there will be other phases down the track. By about 2005, we will be negotiating the next round of targets, and that is highly environmental. It will be driven by science. The third assessment report is coming out next year which will review the science and look at what is happening in climate change. That discussion will take place very much against a backdrop of environmental concern.

Senator LUDWIG—Similar to Senator Cooney, I want to try to establish an understanding of the negotiations so far. Please correct me if I am wrong: I understand you have indicated that there are five major caveats and, unless they are resolved to the satisfaction of the Australian government, the Kyoto Protocol will not be ratified. Is that correct?

Mr Hillman—There are three major ones. I mentioned five issues in the negotiation; three were really mentioned by Senator Hill as major considerations in Australia's ratification decision, that is, sinks, emissions' trading and the other mechanisms, and developing country targets. The other two issues that I mentioned that are key in the negotiation are the package of benefits that will be transferred to developing countries through aid flows, for example, and the compliance regime. The compliance regime will clearly be an important issue for the government's ratification decision as well but not one that was actually mentioned in Senator Hill's statement in April 1998.

Senator LUDWIG—If the compliance issue remained unresolved would we still ratify if the others were met?

Mr Hillman—I do not think that many annex 1 countries would ratify if the compliance issue were left unresolved. The expectation is that it will be resolved at COP6.

Senator LUDWIG—Then there are five issues that remain unresolved and unless they are resolved the Kyoto Protocol will not be ratified. That is what I said. You said three and you have added the fourth. So are we going to throw in the fifth as well?

Mr Hillman—The fifth will be very much a condition for developing countries at The Hague signing on to the package of decisions reached. They will need to see some flows of resources in their direction in order to say, ‘Yes, we agree to this package of decisions at The Hague.’

Senator LUDWIG—Are they the same issues that are on the table of other countries at COP6 in November or are there additional issues that the annex 1 countries have which they wish to put on the table in addition? There are five issues that Australia has in terms of the Kyoto Protocol being ratified, but does the list of issues that are a precursor to the ratification by at least 55 countries blow out that list to more than five issues?

Mr Hillman—That presentation of five issues is, to some extent, a simplification but it does broadly cover it. Under those headings you could find most of the issues that most parties considered important in this negotiation.

Senator LUDWIG—And with COP6 what is the confidence level for at least four out of those five issues being resolved to the satisfaction of at least 55 countries? I am not asking for a prediction, just the confidence level of the Australian government when it goes to those negotiations.

Mr Hillman—I would say that the EU and Japan are very committed to an outcome at COP6. I would say that the United States is very committed to an outcome at COP6. We are committed to an outcome at COP6. The commitment and agreement of developing countries will depend on the satisfaction they receive on their issues, that is, flows of assistance, et cetera, that they are seeking from this negotiation. So I would say that there is a strong will to achieve an outcome at COP6 and you can expect to see the political momentum building behind this from now up until the time of the negotiations particularly in Europe.

Senator LUDWIG—Forgive me for the pun: isn't there a lot of hot air and the balloon is going nowhere? If one of the matters in terms of the engaging developing countries is a bit out there, what happens next? What is after COP6? In other words, no time frame is being developed or agreed to in relation to that issue. With regard to the treatment of carbon sinks and the developing rules for flexibility mechanisms is there a time frame for those issues to be resolved?

Mr Hillman—There is. It was agreed at COP4 that we should resolve the issues of sinks, mechanisms and compliance at COP6 in The Hague.

Senator LUDWIG—That is why I asked you about the confidence level of having those issues resolved. Forgive me if I am putting words in your mouth, but it seemed to me from what you were saying that there is a reasonable confidence level but not one to put your money on.

Mr Hillman—Correct. There is a reasonable confidence level that the issues will be resolved but there are some very big issues on the table here with very large political and economic implications for governments. Every participant in this negotiation is going to have to come away with a package that he or she believes he can sell to his legislature.

Senator LUDWIG—Is there a meeting after COP6?

Mr Hillman—There is COP 7. Given that the United States election is taking place one week before COP6, this has thrown a little bit of uncertainty over it—a bit more uncertainty than you would otherwise have over the outcome of COP6. There is the possibility that COP6 could be suspended after two weeks and then resumed in, say, March when the new United States administration is up and running.

Senator LUDWIG—In summary, where we are to date is that the reservations that we have are unlikely to be resolved in the short term—that is, within the next 12 months—for us to ratify. Would that be a fair statement?

Mr Hillman—That would be a fair statement because of the developing country participation question.

Senator LUDWIG—Could we blow that out to a little longer or is it only within the next 12 months, or are we looking at two to three years?

Mr Hillman—From the point of view of the United States administration, they need to have this thing ratified by about 2003 if they are to get the legislation up and meet their target. So that, in a way, puts a certain ceiling on how far we can continue to negotiate this issue of developing country targets before we reach a crunch point. Our objective, and the United States' objective, is that by COP7 we will settle this matter.

Senator LUDWIG—That has been helpful, thank you.

Mr BYRNE—From reading your submission, one of the key points that seems to underpin a lot of the argument is the ascertainment of the 1990 emissions baselines. Can you tell us what your understanding is as to how we are progressing with respect to that?

Mr Hillman—Once again, that is a question I would defer to the AGO, which have total responsibility for that.

Mr BYRNE—The only reason I raise it is that it says here, in part:

Another relevant consideration to Australia's ratification decision is the ascertainment of a concrete 1990 emissions baseline, without which we cannot assess the magnitude of Australia's emission reduction target.

Notwithstanding the relevant science of it, what I was interested in was your understanding of our negotiation position as to where we are at with that, considering that that will be one of the things that we will be discussing, I presume, at COP6.

Mr Hillman—No, this is not a negotiation issue at all. The rules are in place for determining this baseline and it is a question, I understand, of gathering the appropriate data and interpreting the data. That is in the hands of the Australian Greenhouse Office.

Mr BYRNE—So even though we are a bit unsure about the baseline for the target, is that a concern of other countries at all?

Mr Carruthers—Mr Chairman, it might be helpful if I commented at this point, in terms of moving the discussion along. In Australia's case, we have been producing, under the provisions of the framework convention on climate change, since about 1994, a national greenhouse gas inventory of emissions. It is comprehensive; it covers all the greenhouse gases. It covers all the relevant sectors—energy, transport, waste, forestry, and land clearing emissions. However, for the Kyoto Protocol, obviously the assigned amount and our target is derived from our 1990 emissions baseline. At some point, which will be decided through a COP decision, we will need to put a definitive 1990 baseline into the process to essentially establish our assigned amount and therefore what we are working to for our Kyoto target.

The situation at present is that Australia has invested significantly in its national inventory. I think we are seen in world terms as operating to a very high standard of practice. However, particularly in the case of the land use change and forestry sector, we know that at present we have high uncertainties in the estimates of emissions. This is peculiarly important for Australia because in the region of 15 per cent of our national emissions are associated with land clearing activity and perhaps another five per cent are associated with forestry sink activity. So a major investment is going on through a program known as the national carbon accounting system, managed through the Australian Greenhouse Office, which is directed at giving us much better estimates for the land use change and forestry sector. Indeed, the Australian Greenhouse Office is working towards a goal of having a solid baseline for the land use change and forestry sector in 12 months time.

Mr BYRNE—I have a question about the mechanism when a dispute arises. Say, for example, one of the countries said, 'We don't agree with your 1990 emissions baseline. We think you are exceeding what you should be putting out.' What is your understanding about how, after we have ratified the protocol, that would be resolved?

Mr Hillman—That would be resolved through the compliance system. The way the compliance system is shaping up, the matter could be referred to a facilitative body, a bit like the OECD where you go along and explain your economic policies. You could go along, have a discussion of the issue and bring forward your arguments as to why you compiled your inventory in a certain way. It may well be that that body would say, 'Yes, now we understand, but couldn't you do this and fix it up?' On the other hand, you could get to the point where it would say, 'Sorry, this practice is unacceptable, it does not conform to the rules.' Then you are in a compliance situation—that is, for some reason you may not have complied, the way you have counted may mean that you have in fact exceeded your target, and then you are into the compliance process, which has not yet been finalised. You would have time to go to the market

possibly and buy up tonnes to meet your target, or you could implement some sort of program of national action—these things are all on the table—or you could be fined. Some countries, particularly in the developing world, would like to see a non-complying annex 1 country pay a hefty fine and/or be cut off from access to emissions trading.

Mr BYRNE—My understanding of what you have just said is that, whilst we are moving closer to trying to ratify this, we have no dispute resolution mechanism that has been put on the table.

Mr Hillman—That is the compliance system. It is one of the things—

Mr BYRNE—But you have just told me that you have not resolved the compliance system. So where are we with respect to the negotiations on the compliance system?

Mr Hillman—It is an issue to be settled at COP6 in November in The Hague. The issues are still being discussed. But, of course, the question of compliance is not going to arise until we get to the compliance period, which is 2008 to 2012.

Mr BYRNE—But one of our preconditions to ratifying is our satisfaction with compliance, so why are we going to ratify? You are talking about us ratifying it. It seems to me there is a fairly strong contradiction there.

Mr Hillman—No, I am not saying anything about ratification. That is an issue for the government. The government, when it looks at the package on the table in front of it, will be looking, among other things, at the compliance system and whether it feels it can live with it.

Mr BYRNE—It just appears from what you are saying that there is an expectation that it is going to be ratified—and the compliance stuff is going to be sorted out afterwards.

Mr Hillman—No, I am sorry, I have given you completely the wrong impression. The compliance system is expected to be settled at COP6 as part of this package, including sinks and the mechanisms. If it is not settled at COP6, then we will be at COP6 plus or COP7. It will need to be settled for us and for other annex 1 countries before they move to ratification.

Mr BYRNE—So what is our attitude towards an appropriate compliance mechanism?

Mr Hillman—The emphasis in Australia's approach to compliance has been on facilitation and on countries meeting their target through political will rather than under threat of some sort of penalty if they do not meet their target. Other countries envisage a more punitive approach; they want to see fines or—this is the European approach—they want to see, 'Oh, you have not met your target, Australia; therefore you must put in place the following set of policies to improve your climate change performance.'

Mr BYRNE—What is our tolerance band when we go into negotiations? There has to be some sort of tolerance band in position. We obviously have a position when we are negotiating this. What is your understanding of our tolerance band in negotiations?

Mr Hillman—The tolerance band on this and other issues will be decided by the government nearer COP6.

Mr BYRNE—Do you have any understanding as to what that might be?

Mr Hillman—We currently have the positions agreed by the government on compliance. The government will be looking at these issues again in the next month or so, with a view to finalising our position for COP6, and they will decide what their tolerance band is.

Mr BYRNE—Is there an agreed monitoring mechanism with respect to countries and their emission targets? How is it going to be monitored overall? Do the countries monitor it themselves, do other countries monitor it for them or how does it work?

Mr Hillman—Under the articles of the protocol, there are inspection teams which come out and look at your records and look at your implementation. There are bodies being established, as I said, to examine and discuss to what extent the way you have counted your inventory is correct or in conformity with the rules. If it is not, then there are facilitative measures to bring you back in, and ultimately under the compliance—

Mr BYRNE—It comes back to compliance?

Mr Hillman—Yes.

Mr Carruthers—I might just add that those implementation provisions which centre around having a national system in place for tracking progress against targets are currently the subject of negotiation, and they are advancing quite well. I think we can have fair confidence that there will be decisions on those matters at The Hague conference under the general rubric of the compliance topic.

Mr BYRNE—What is our position with respect to having a withdrawal mechanism built into the protocol?

Mr Hillman—It is already built in at article 27.

Mr BYRNE—So there is a withdrawal mechanism from the protocol even after we ratify it?

Mr Hillman—Yes.

Mr BYRNE—Without penalty?

Mr Hillman—There is no penalty mentioned in article 27; you just withdraw.

CHAIR—Japan's position does not seem so clear. They are a net importer of energy. They, I suppose, have competitive advantage and disadvantage concerns vis-a-vis other rivals. Where are they in these negotiations? Are they with the EU some of the time and then some of the time with us? Where are they?

Mr Hillman—Japan are a member of the umbrella group which I mentioned in my introductory remarks—that is, the United States, Canada, Australia, the Ukraine, Russia, Japan, Iceland, Norway and New Zealand. Even though the umbrella group pretty much sticks together in the negotiations, there are differences of approach on individual issues within the group. Japan are currently in the negotiation, I would say, placing emphasis on two issues: the first is getting an outcome on sinks, and they have a particular approach on sinks which Ian Carruthers could talk about at length; and the other issue they are very concerned about is compliance. Japan see the Kyoto Protocol as almost a product of Japan because it was done in Kyoto and they are very reluctant to see it amended. For their own particular reasons, they are concerned that the compliance regime should not involve binding consequences because that will mean amendment to the protocol and that appears to be a national issue for them. So they are the two issues they are currently focusing on.

CHAIR—Regarding this compliance business, if you draw the picture as large as possible, you have a proposed agreement and we have signed it but not ratified it. If it is to be effective at all, it must be enforced in some fashion, as you said, and there are a spectrum of views about how fierce that enforcement mechanism should be. We are committed to an outcome at COP6. Everyone seems committed to an outcome except the G77-China group. I think Mr Byrne asked you what our negotiating brief says about facilitation. Can you elaborate on that? You have given us an abstract now as to our position and, to be polite, that is not good enough for us. We have to have more than that. This parliament deals in abstracts to far too great an extent already, and that is why we get criticised. We need something to tell people back home about what facilitation means.

Mr Hillman—In the context of compliance?

CHAIR—Yes.

Mr Hillman—Facilitation would be discussing the issues, for example, and identifying ways of handling them. Facilitative measures could then go beyond that—sort of non-punitive measures. The sort of thing we would have in mind would be that, for example, in the unlikely event that Australia did not meet its target, we would have the option of borrowing forward—that is, subtracting tonnes—from the next commitment period without any penalty. That is already going to make it more difficult for you in the next commitment period. That is the sort of thing that we would have in mind for a facilitative approach to compliance.

CHAIR—All of those mechanisms to make it happen, such as the inspection teams and some sort of supranational body that would comment on what is domestic policy, would have to be part of that, would they not?

Mr Hillman—Yes.

CHAIR—Has the government agreed to this? It is in your brief?

Mr Hillman—We have agreed that there should be some sort of compliance body. There has to be in order to (a) provide the facilitation advice and (b) ultimately make a judgment on whether or not you have complied with your obligation.

CHAIR—So would there be something like the human rights committees in Geneva perhaps? Would there be a supernational body that comments?

Mr Hillman—The composition of the compliance bodies is under discussion, but they would be composed of signatories of the protocol. Our preference and that of other annex 1 countries is that the majority of those individuals would be from annex 1 countries—that is, we would favour a situation where the compliance body and decisions on compliance would be made essentially by individuals whose countries also have obligations and targets.

CHAIR—So it would be the emitters.

Mr Hillman—Yes.

CHAIR—But among them you would have a majority of members or signatories who were from the G77 group, wouldn't you, as with human rights?

Mr Hillman—The majority of signatories are from the G77, but this is an issue in the negotiations. It is our objective to have a majority on this compliance group from annex 1 countries.

Ms Andrews—May I just make the point as well that this is a compliance issue that is largely focused on quantitative assessment; it is not an issue of subjective assessment to the same extent as, for example, human rights issues are—far from it. The compliance bodies would be looking at processes for the inventory collection and data and the results and outcomes of those against a very well defined quantitative target.

CHAIR—Are these the same as the quantitative issues that your colleague Mr Carruthers said not long ago were full of uncertainty? You are talking about issues of science, for example, or quantitative—that is, numerical—things, and you propose to establish a supernational body with a majority, assuming it is to be elected, of governments that do not share our view. You are going to give them some kind of authority to make decisions on these quantitative matters about which there is already great uncertainty already.

Ms Andrews—I think it would be helpful if Mr Carruthers, who is not just a domestic expert but something of an international expert on the inventory methodologies, would give you a little bit of an overview of that. There are rules which will be, and have been, defined up front that will restrain the capacity for subjective decisions within those assessments in the future.

CHAIR—We will get to Mr Carruthers in a minute, but we have to establish—and I think we have with Ambassador Hillman—that the negotiating brief for COP6 encompasses these things such as inspection teams, the supernational body and something that in some fashion resembles the human rights monitoring mechanisms already on foot in Geneva. Although a lot of it is still to be negotiated, as you said, you cannot rule out a similar kind of structure.

Mr Hillman—The probability is that we will end up with a structure which does reflect annex 1 interests. It is a pretty fundamental issue for annex 1 countries. We have the targets. We want to be working with our peers on this issue and not with countries that do not yet have substantive commitments.

CHAIR—The EU and the G77 seem to be at one on most of these things for different reasons.

Mr Hillman—No, I do not think they are at one. I think the EU is also very much of the view that annex 1 should be in the majority in any compliance body.

CHAIR—But they seem to agree. In Lyons, at least, they seem to be agreeing on a lot of things that we seem to be imposing, such as limits and caps on sinks and things like that.

Mr Hillman—There is in the EU position some similarity, certainly on caps. That is a very strong negotiating position of the EU, although there are major questions about how far they will in fact stick with it.

CHAIR—We could go on for ages but we had better stop there. That was a very clear presentation and I think it was very useful for us. We will probably convene again in Canberra—I am sure we will. After COP6, if you would kindly come back and give us, with the same clarity, a description of what happened, we would be very grateful.

Mr Hillman—Thank you very much, Mr Chairman.

CHAIR—We will ask the AGO to present next. Ms Andrews, are you going to make a statement?

Ms Andrews—A very brief statement because I will not go over the detail of our submission, since you have had it for a little time now. I make the point, however, which has been the subject of discussion with the ambassador for the last hour or so, that the protocol is still in negotiation. Therefore, the government needs to retain a certain amount of flexibility in order to tailor its responses to what could be a range of outcomes.

One of the important things to note, whether it is in the current transitional period or in a period where we may have ratified and be working with an agreed international instrument, is that the mix of measures that any government would adopt to meet the targets under that instrument are a matter for national choice. Therefore, the extent to which measures will be, or may be, imposed on the Australian government is certainly something that we have argued consistently throughout the negotiations should be minimised and that national governments should be in a position to tailor their measures to meet their national circumstances.

To date, the measures that the Australian government has adopted are outlined in three different statements. One is the Prime Minister's original statement in 1997 pre Kyoto called *Safeguarding the future: Australia's response to climate change*. The second is the national greenhouse strategy which was agreed by all Australian governments in late 1998. That strategy includes the same package of Commonwealth measures and a few more, as well as a number of measures in the jurisdiction of states and territories. Finally, there was the *Measures for a better environment* statement which was part of the tax package at about this time last year or a little bit earlier. That adds up to a significant package of domestic measures—almost \$1 billion of money committed to greenhouse response over a five-year period. On a per capita basis, currently that is at or near the highest commitment of any national government in the world.

I also note that you can find, I believe, a common thread throughout each of those statements in terms of the government recognising both the importance of the environmental commitments made at Kyoto and the need to minimise cost burdens to the Australian economy. There has been some brief discussion of that issue throughout the questioning, but I make the point that those are not necessarily—and probably not at all—objectives in opposition. The reason that they are not is that cost minimisation would allow you on the domestic front to achieve more and internationally to minimise some of the effects of the fact that some countries may have targets and others may not. In other words, the extent to which we can keep the costs down allows us to achieve better environmental outcomes at home and also allows us to combat the issue of carbon leakage more effectively, which is potentially an issue that undermines the environmental outcomes of the protocol as a whole. So the government position on effective environmental outcomes and cost minimisation is in fact quite a responsible one.

The cost minimisation focus is both domestic and international and it is a major reason why we are interested in the flexibility mechanisms under the Kyoto Protocol. I note that the committee in its terms of reference has posed a number of questions on emissions trading and how it might work within Australia. We will be very pleased to discuss those in as much detail as you wish today. I make the point up front that there has been no government decision on emissions trading as a whole, with the exception of the recent decision on timing—that if there were to be a mandatory emissions trading system introduced in Australia, that would not happen until Australia had ratified the protocol, the protocol was in effect and there was an international trading regime in effect as well.

I also note that you have a number of questions and concerns about sequestration. The Australian Greenhouse Office is working very actively in this field domestically and is also contributing most of the power behind the negotiating position on sequestration in particular. We are happy to answer questions in that regard, noting again that both these issues of flexibility mechanisms and sequestration are matters for negotiation at The Hague.

In conclusion, because of the current status of international negotiations, there are still large uncertainties in terms of the policy environment. Therefore, the government needs to retain flexibility but still be able to move towards putting the Australian economy as a whole in a better position to respond to what is increasingly looking like a real possibility, which is the fact that there will be constraints on carbon emissions in the future. In taking that path, the government not only needs to be concerned about effective environmental outcomes—and we certainly are, and are contributing to that on a global scale, against a background where Australia really only contributes 1.5 per cent of the existing greenhouse gas emissions globally—but also needs to recognise that this kind of constraint will impose restructuring to some extent on the economy. Therefore, we need to look at cost minimisation as a key focus of policies. Also, with respect to the issue of competitiveness of the Australian economy, we need to consider how that may change in the future; that is, what will be a competitive economy in the future when carbon emissions are likely to be constrained. I think I will leave it at that and welcome questions from the committee.

Senator BARTLETT—With respect to the question that was asked before on the overall science underpinning this, what is your view, as a body that spans a number of Commonwealth departments, about suggestions that the science underpinning the whole greenhouse push is discredited or unsustainable?

Ms Andrews—I do not feel qualified to comment on the science itself. Dr Mitchell from the CSIRO is present. The CSIRO as a whole are an independent and highly credible scientific adviser to us, so we tend to rely on them for the details of the science. In terms of our stance, when we advise the government, we believe that the science is becoming more certain rather than less certain. We believe that the third assessment report of the IPCC which is due out in the first half of next year will underline those kinds of conclusions and that the scientific consensus is moving towards a clear indication that human activity has had an impact on the climate and is likely to continue to do so.

Senator BARTLETT—What stage is the emissions trading issue at?

Ms Andrews—As you know, we published a series of four discussion papers throughout 1999 which were very well received. We provided thousands of copies to a number of commentators. We received about 150 submissions back with regard to those papers and we have now synthesised most of the information out of that dialogue. We are at a point where we will be advising government through the cabinet process very shortly on what the next steps may be with regard to emissions trading.

Senator BARTLETT—Does the AGO feel that it is essential that we not proceed down an emissions trading system path until we can have an international system in place?

Ms Andrews—That is the position that the government has taken. It is a whole of government position. From an economic point of view, it defines what are probably the optimal conditions for introducing emissions trading in Australia.

Senator BARTLETT—Accepting that might be optimum, if that optimum cannot be reached is it still something that we should consider?

Ms Andrews—The government has set the parameters on that now, so we will work within those policy parameters. Certainly as we lead up to what we will assume will be the first commitment period under the Kyoto Protocol—2008 to 2012—we will be constantly reviewing the status of our emissions and advising the government, and the government at that point in time may reconsider.

Senator BARTLETT—When you say the government has set the policy parameters on that, I understand that. But when you are talking about the AGO advising government or cabinet, do you basically just accept that your advice has to be within those parameters or do you still put forward advice saying, ‘Here is some more information. Maybe you want to reconsider’?

Ms Andrews—One of the key issues in terms of our advice over the coming years leading up to the period will be our assessment of how we are going against the target. That assessment will basically provide the basis for any government consideration and/or reconsideration of any mix of policies that is currently in place.

Senator BARTLETT—As things stand at the moment, are we likely to meet the target?

Ms Andrews—As things stand at the moment, we are still in a position where we are likely to exceed the target. However, I would make the point first that the existing measures that the

government has mandated are relatively new, are just getting off the ground and have not really had time to bite yet, so we are not certain of the impact of those measures. The other large uncertainty in that assessment is the contribution of land use change to the 1990 baseline. Until we tie down, within the next year or so, exactly what that is, we do not really have a baseline against which to make the projections. So we are still uncertain on that.

Senator TCHEN—My question is to do with carbon sinks and sequestration. Shall I address it to Mr Carruthers?

Ms Andrews—Yes, please.

Senator TCHEN—Firstly, can you explain to us why this issue of sequestration is critical to Australia?

Mr Carruthers—It is basically tied in with our overall greenhouse emissions profile in Australia. We of course do have a major component of emissions associated with energy activity—from stationary energy, particularly electricity production, and from transport and a range of other sources. But emissions and sink activity associated with activity on the land is a quite substantial component of Australia's emissions profile, particularly in terms of establishing new forest sinks; of opportunities, if policy direction were such, to reduce land clearing emissions; and, more broadly, with agricultural practices in cropping and the like. This is a characteristic area of opportunity for Australia. Of course, other countries also have opportunities in this area—the United States, with a similar land mass, and Canada—but what we are looking at here is a higher proportion of land based emissions and sinks activity for Australia relative to most other industrialised countries. It is a characteristic situation in terms of Australia's greenhouse response and it is reflected in the National Greenhouse Strategy, which has been agreed by the Prime Minister, premiers and chief ministers.

Senator TCHEN—My understanding of the nature of these sinks, of this sequestration process, is that they are not so much a sink but a temporary storage. Is that right?

Mr Carruthers—In some situations they could be considered a temporary storage. But in a sustained agenda, for example, in the establishment of new forest sinks with the establishment of a new forest estate, there is an uptake of carbon in the above ground biomass—in the trunk, the canopy and so on—and in the roots and the soil. If you maintain forest cover—maybe you have harvesting on an intermediate basis but if over the long term you maintain that forest cover—you will maintain the carbon stocks, the carbon sink, for the long term.

Senator TCHEN—In the CSIRO submission they mention the sequestration strategy they have undertaken. I am not sure whether it is fair to ask you those questions, but can you answer them?

Mr Carruthers—I am happy to comment on policy and program dimensions, but the CSIRO would be better equipped to respond on technical and scientific matters.

Senator TCHEN—The CSIRO has apparently been looking at eight different strategies for carbon sequestration. The first one is fascinating, and I have to ask the CSIRO about it; it

concerns the reduction of methane emissions from livestock. I do not know how you achieve that.

Mr Hillman—Kill them.

Senator TCHEN—Some of the other strategies include increasing plantation forestry and increasing agroforestry. The other one is a reduction in the rate of land clearance, which you have mentioned. It seems to me that the estimates they have provided show that increasing commercial forestry, for example, could potentially achieve double to eight times the benefit of a reduction in land clearance. I would like you to comment on that. The straight reading of it is that we would be better off clearing all the old-growth forests and replanting them. Can you comment on that?

Mr Carruthers—I will leave the CSIRO to comment on the technical dimensions of agricultural emissions. Going back to previous remarks about the emissions profile, agricultural emissions, which is basically from cattle and sheep livestock, account for 20 per cent of Australia's emissions profile. So if there is opportunity for greenhouse action there, then obviously it is a significant area. In terms of sink activity and increasing commercial forestry and reducing land clearing, I am not privy to the detail of the analysis and assumptions that underpin the table that appears at page 20 of the CSIRO submission. They might like to explain that.

In terms of Kyoto Protocol compliant forestation activity—that is, forestation and reforestation—the estimates brought forward in Australia's submission of 1 August for the purposes of the international negotiations would have delivering during the commitment period a CO₂ uptake that was about the middle of the range set out at item (e) of the CSIRO table. In other words, we estimate it might contribute about three per cent towards Australian target. That was on an assumption of maintenance through the next decade of the plantation rates that have operated through the second half of the 1990s.

In terms of reducing land clearing: land clearing emissions, as mentioned previously, possibly account for about 15 per cent of our national emissions profile, and any changes in land clearing emissions through to the first commitment period are dependent, of course, on what policy scenario you take in terms of any response in the rate of activity on land clearing. It also depends very much on getting much better numbers in the base year land clearing estimates and in the land clearing rates for the ongoing years. We will have a much better handle on that carbon accounting side, as I have mentioned already, within 12 months.

Senator TCHEN—The underlying basis of my question is this: when you are assessing carbon sequestration and feeding the information into negotiations, in your accounting do you take land clearance as a net debit or do you take into account subsequent activities which may in fact create credits?

Mr Carruthers—The activity which commences the carbon accounting on the land under the Kyoto Protocol would be the initially defined activity. If it is reforestation, from the time of the forestation activity—post 1990—you would begin the carbon accounting. Obviously, you start with a sapling and it grows over time to a mature tree, and if you harvest that tree then, presumably, there would need to be accounting for that under the Kyoto rules. In the case of

land clearing, at the time of land clearing the carbon accounting would commence and there would be a substantial loss of the carbon stock on the land, and under the Kyoto Protocol rules it would, presumably, be the case—and this has still to be decided, but this is the basis on which we are working—that there is ongoing tracking of the carbon accounting on that area of land.

Senator TCHEN—Is that an agreed process or is that the process you are working under and eventually Ambassador Hillman will have to persuade other countries to accept this accounting process?

Mr Carruthers—This is among the matters for consideration and decision at COP6 but, in terms of the way the tide is running at the present time, there is a widely held view in the negotiations that this is the set of arrangements that will apply.

Senator MASON—I should apologise in advance: so much of what Senator Bartlett and Mr Byrne have said today and on other occasions is concerned with scientific evidence and assumptions. I failed science at high school, so I will keep my question very simple. The ambassador mentioned earlier that the concerns developed countries have about undeveloped countries in terms of carbon emissions may to some degree be offset by a lessening of the cost of complying with the new guidelines under the Kyoto Protocol. That is terrific; it is a great goal. Referring to figure 1 on page 3 of your submission, I cannot follow what that means—maybe it goes back to high school. It is a great summary.

Senator TCHEN—It is accounting.

Senator MASON—Senator Tchen says that it is accounting—I did not do very well at that, either. Can you please explain to me what that means. That summary is fundamental to your submission.

Ms Andrews—I am pleased to say that this does not have much to do with science, so I can avoid the scientific basis of the question. This is an attempt to explain diagrammatically how an emissions trading system might be implemented in Australia. The top line basically says that you firstly identify your assigned amount of units for the Kyoto Protocol period, which is 108 per cent of our 1990 baseline multiplied by the five years of the commitment period. Once we know what the 1990 baseline is, that will translate to a certain number of megatonnes of carbon dioxide equivalent emissions that the economy as a whole may emit during that period. We can then take that number of megatonnes of emissions and produce an equivalent number of permits which we will make available through one means or an other—the allocation methodology is yet to be decided—to emitters within the economy and or people who will become emitters within the economy in that period.

You then need—and this is shown on the third line—a tracking system in place, that is, a way in which those emitters will report their use of the permits, retire the permits as they are used and report their emission levels as a whole. The fourth line represents the market activity within that system. Emitters may find that they hold at any given point in time either too few or too many permits for their particular operations and they may wish to buy and sell those tradable permits. The market, in theory, will ensure that those permits go to those people who value them the most and are therefore willing to pay the highest price.

The line about domestic sinks represents the fact that this system I have described in the four lines above is constrained by the number of assigned amount units and therefore the number of permits. But domestic sinks activities can generate credits that are additional to those, as may trade at the international level or participation in the clean development mechanism. Joint implementation may, again, add to those assigned amount units. So that represents the totality of the currency, if you like, that would be circulating in that emissions trading market.

Senator MASON—Thank you, I can follow that. There are domestic precedents for this sort of approach, aren't there, in terms of the sale of 'pollution credits' and so forth? This is not a new idea; there are precedents for this.

Ms Andrews—There are other environmental markets in areas like water allowances, and in the United States there are sulfur dioxide and nitrous oxide emissions markets. Yes, there are other environmental markets.

Senator MASON—Have they worked well?

Ms Andrews—I will ask Dr Harrison to give you a brief view. Perhaps the United States market is the one most often used as a parallel for these kinds of emissions markets.

Senator MASON—It is a marvellous example of market economics constrained for a certain outcome.

Ms Andrews—Yes.

Dr Harrison—Yes, there is a system like it in the United States—the sulfur dioxide trading market, which is a national market that has been operating for several years now. I think it was implemented in 1995 or perhaps earlier. It is generally regarded as successful. Compliance with the market has been 100 per cent. There have been no instances of non-compliance so far, basically because the penalty set far exceeds the cost of compliance with the system. The price of sulfur dioxide emissions has been much lower than was generally predicted before the market was established, basically demonstrating that once you establish a market the inventiveness of market participants comes into play and they find ways to reduce emissions—all sorts of ways that had not been anticipated before the market started. The prices were originally expected to be several hundreds of dollars per tonne of sulfur dioxide. When the market got established, trading started at about \$200 a tonne; more recently the price has been down in the low \$100s—\$130, maybe.

Senator MASON—It is a commodity.

Dr Harrison—It is a commodity, it is well-established, it is well accepted, and it is achieving its objectives.

Mrs DE-ANNE KELLY—Dr Harrison, you addressed a seminar organised by the Victorian Department of Treasury and Finance on 8 March last year. I have a quote which is attributed to you and I would like to know whether it is accurate. You are alleged to have said:

Even if some brilliant scientist was overnight able to show that science of global warming was invalid, it would not make any difference. 180 nations have signed onto the Kyoto Protocol—there is no turning back.

Is that an accurate quote?

Dr Harrison—I was—

Mrs DE-ANNE KELLY—Yes or no will do.

Dr Harrison—I could not say whether the words are exactly accurate.

Mrs DE-ANNE KELLY—But that is the gist of what you said?

Dr Harrison—I was pointing out that, if some young scientist discovered something new, it would take a while before it became orthodoxy amongst the science profession, and a while longer before it influenced policy making and so on. In the meantime, we have a very well-established body of science through the Intergovernmental Panel on Climate Change. It would take an awfully long time in practical terms to turn that around.

Mrs DE-ANNE KELLY—But here you say ‘overnight’—not an awfully long time—and that if it happened overnight it would be irrelevant. That is apparently what was attributed to you. Your words, apparently, were that, even if a scientist did this overnight, it would not make any difference.

Dr Harrison—No, that refers to the situation where one scientist came up with some new theory. It would take a long time before you got that established through the scientific orthodoxy. That is what I was saying: it would not make a difference because it would take a long time before new scientific facts discovered by one scientist became part of the orthodoxy and got to the stage of influencing policy.

Mrs DE-ANNE KELLY—I trust that your remarks are not indicative of the overall view of the Greenhouse Office, that is, that science does not matter and it is a political exercise. I trust that is the case, is it?

Dr Harrison—I can assure you that my remarks never implied that science does not matter. I was pointing to the fact that there is a very well-established body of science in this area that has been built up over a number of decades, and it is so well established that it would be very difficult to change. Even if some new facts came to light tomorrow, it would be a while before those facts could be tested and become part of the new scientific orthodoxy and then influence policy and so forth. I was not saying science is irrelevant; I was pointing out that there is a very long established body of scientific development that would be unlikely to disappear in an instant. I was emphasising the fact that there is a scientific basis there and that it is so solid it is not likely to change swiftly.

Mrs DE-ANNE KELLY—Moving to emissions trading, is the carbon to have a universal price regardless of where it is grown or the cost of the land on which such sinks are established? Is carbon to have a universal price per tonne?

Dr Harrison—As carbon becomes an internationally tradable commodity, under the Kyoto Protocol there would be, like any other commodity, a reasonably clearly identifiable world price—just like there is for various grades of coal or oil.

Mrs DE-ANNE KELLY—We are talking about trees at the moment, but I understand it can relate to other vegetation. Regardless of whether you were growing trees on land worth \$1 per hectare in Australia or \$US10,000 in Europe, the value of the carbon would be universal. Is that correct? Is that what you are saying? Are you saying that it would have a certain value per tonne?

Dr Harrison—Lands of different productivity would grow very different amounts of carbon, but the actual unit of carbon would have the same value regardless.

Mrs DE-ANNE KELLY—For biodiversity in Australia, I would assume there is more value in having a diverse range of vegetation and trees. Is that so?

Dr Harrison—On aspects of biodiversity I would rather defer to Ian Carruthers.

Mr Carruthers—In terms of vegetation cover in Australia that serves the national interest, we are obviously looking for a mix of vegetation cover, for example, forests for purposes of commercial production, and we have seen expanding plantation activity, particularly during the 1990s in Australia, to enhance the forest resource. There is also a very significant issue, as I am sure you are well aware, concerning the conservation of biodiversity. The government separately has policies and agreements with the states in that area—that is not handled by the Australian Greenhouse Office.

The Australian Greenhouse Office is contributing in some significant ways. I might mention as an example the Bush for Greenhouse Program, administered through the Australian Greenhouse Office, which is providing a vehicle for corporate investment in establishment of environmental plantings, native vegetation on properties. This would be by agreement through a carbon broker who has been appointed for an initial two-year period in terms of gaining the investment dollars and the land-holder agreement. We are at the point of securing in the next few months, we hope, the first round of major agreements, but the market testing we are doing with both the land-holders and industry investors is very positive.

Mrs DE-ANNE KELLY—I understand that reforestation has to be man-made forest. Is that one of the matters being discussed? It is not a natural forest?

Mr Carruthers—That is correct. In terms of the provisions to the Kyoto Protocol, it is perhaps useful to look separately at the currently agreed eligible activities of afforestation and reforestation, and we can be quite confident that the way the decisions will come out in The Hague will be in terms of establishment of new forest since 1990 on land that at 1990 was not forested.

Mrs DE-ANNE KELLY—I am sorry to interrupt you, but I know time is of the essence with our chairman and I want to get a specific question across. Therefore, in developing countries where there are extensive natural forests, those forests effectively have no worth in terms of carbon credits, do they? So, presuming a developing country were to sign up to Kyoto

anyway—which is not apparently the case at this point in time—what is to stop them bulldozing that forest? There is a great incentive for them to bulldoze a natural forest and then reafforest it, because it has to be man made since 1990, which, after all, defeats the purpose, does it not?

Mr Carruthers—The provisions we have been discussing here this morning have concentrated on the establishment of new forests in annex 1 parties, the industrialised nations. On the question of the role of sink activity under the Kyoto Protocol in developing countries, as Ambassador Hillman has explained, it is the clean development mechanism which is the vehicle for project activity in developing countries for purposes of the kind of activity to which you refer. One of the key issues for The Hague conference is the question of the inclusion of sinks in the clean development mechanism. That is a matter of debate. Australia supports the inclusion of sinks in the clean development mechanism and we are actively contributing to the policy debate on that and to the technical contribution on how one might go about maximising sustainability of forest cover in developing countries to this end.

Mrs DE-ANNE KELLY—I would particularly like to have that available to the committee—the definitions and the way in which that has been worked through—if that is possible?

Mr Carruthers—Yes.

Mrs DE-ANNE KELLY—On the emission reduction units, is there a minimum quantity of carbon, for instance, that could be stored in a sink? I guess my question is: is this going to be available to small farmers and small land-holders in Australia or is this just for the big companies?

Mr Carruthers—The proposals that Australia has put forward in its position under article 3.3 involve, with new forests, a minimum area of one hectare. That is quite small. We have also brought forward a proposal under article 3.4 for additional sink activities for areas below that. So potentially, in any practicable sense, if we are successful in our approach—and in terms of article 3.3 we see a very wide acceptance from the European Union and there are US proposals of a similar kind—there is a very real prospect for small land-holder involvement. One of our tasks at the domestic level through the Australian Greenhouse Office is to make sure that we can handle that in ways which lower the transaction costs of participation. We do believe that, through the appropriate design of any future national emissions trading scheme, through the kinds of carbon broker arrangements with the Bush for Greenhouse Program and so on, there are a number of avenues where we can maximise possibilities for land-holders to participate if they so choose.

Mrs DE-ANNE KELLY—And that will not be compromised; you will continue to press for that minimum area?

Mr Carruthers—No.

Mrs DE-ANNE KELLY—I would like an assurance from Ms Andrews that the science does matter, despite comments made from her office, and that nothing is absolutely decided yet—that it will be a matter for the government, after consultation with the Australian people.

Ms Andrews—I can give you a categorical assurance—and I am pleased to have the opportunity to put it on the record—that the science, of course, does matter. You can probably rely on the fact that we have addressed the issue directly here to give you confidence that the assurance is there. With respect to the quote, whether accurately recorded or not, from Dr Harrison’s contribution to a seminar that obviously was not directly focused on that issue, those quotes get taken out of context. This is a direct response to that question and the science does matter. The scientific process that is associated with the UN Framework Convention on Climate Change is the Intergovernmental Panel on Climate Change. That is the process through which all governments are advised on the consensus on the science and that is the process through which the Australian government will be advised on the consensus.

Mr WILKIE—This question is to Mr Carruthers. Recently, we were in the Latrobe Valley getting evidence from the coal-fired power producers down there. They were saying that, in order to meet the carbon pools and storage in sinks, if they were to plant trees they would need to plant two million hectares annually just to comply. I am wondering how practical that is as a method of achieving their carbon credits.

Mr Carruthers—I do not think that anybody is suggesting that establishment of carbon sinks through tree establishment is some sort of magic bullet to deal with greenhouse response. What the government has put forward in its National Greenhouse Strategy, as I remarked before, is an approach which involves cost-effective activity across all sectors, addressing emissions and sink uptake. Sinks do have a role to play in contributing to the outcome and reducing overall costs of achieving a future Australian Kyoto target. But that is not to suggest that, for example, power stations would only take abatement action through sink establishment. They have a role to play. They are doing it already, for example, through their voluntary Greenhouse Challenge cooperative agreements, but there are a number of other measures in place which are being administered by the Australian Greenhouse Office which are directed towards emission abatement in the stationary energy sector and power stations.

Mr WILKIE—They also advise that if they were to fully comply with Kyoto protocols as they exist at the moment, they would end up going broke paying for the carbon credits whilst they are trying to develop technology that would actually reduce emissions. Is there any incentive from government, for example, to help them to develop that new technology so that they can reduce the emissions or do they have to rely on waiting until they get the reductions before they get any benefit?

Ms Andrews—We do have a number of programs. Probably the one that would most directly apply to them in terms of incentives is the Greenhouse Gas Abatement Program. I believe that there are some applications under that program that deal with technology relating to coal-fired power generation. The selection process for that particular program focuses very clearly on cost effectiveness, so the extent to which they are successful in gaining any economic incentive from the government on that front will depend on the cost of their proposals in terms of technology development.

Senator LUDWIG—Ms Andrews, I am trying to understand the role that your office plays. It states in the Commonwealth’s submission to the Senate inquiry into Australia’s response to global warming that you are the lead agency. Will you go to COP6 or COP7?

Ms Andrews—Yes, we will. We will go as part of the delegation. I personally will not go as part of the delegation. I will go to COP6 to present some information in the margins, as they say, of the conference—there is a bit of a trade show element to it—about Australia’s response as a whole. Certainly, Mr Carruthers and a number of our other staff go as part of the delegation to be involved in the negotiations.

Senator LUDWIG—So your office goes as part of the delegation to participate in the negotiations?

Ms Andrews—Yes.

Senator LUDWIG—You say in that particular paper that the Commonwealth government recognises the critical and pervasive nature of the threat of global warming. At the bottom of that same paragraph you then say:

The Government is committed to addressing global warming in a way that effectively promotes Australia’s national interests.

Is that the precondition for it being a critical and pervasive nature? In other words, it is not critical or pervasive unless it satisfies your national interest first?

Ms Andrews—I think that is the issue I was referring to before about the need to integrate both the environmental outcomes and the economic concerns in terms of the restructuring of any economy that will occur if this protocol comes into effect. Australia is certainly not alone in addressing the negotiations on the implementation of the Kyoto Protocol from the point of view of national interest. Across the economy any stakeholder that is involved in any level of emissions would certainly expect the Australian government to have the national interest and economic issues in mind at the time that it goes into these negotiations because other national governments will be addressing it from that point of view as well.

Senator LUDWIG—Who makes the decision ultimately in respect of whether the Kyoto Protocol is ratified? Is it a recommendation from your office?

Ms Andrews—We may be asked to advise on a number of elements, but there will be a national interest assessment carried out through the normal Foreign Affairs and Trade processes and put through a parliamentary process before the government makes the decision on ratification.

Senator LUDWIG—Will you participate in that?

Ms Andrews—We will probably participate to the extent of putting together information for that national interest assessment.

Senator LUDWIG—I am just trying to understand where you fit in. As I understand it, you have spent something like a billion dollars on promoting ‘green’—if I can use that general label—but I then hear from Mr Hillman that the possibility of a ratification of the Kyoto Protocol is out there, that it is not certainly within the short term, within 12 months. Will that spending continue at the rate that you have already been spending on the basis that the Kyoto

Protocol will be ratified, or are you going to assess whether or not that money should be continued to be spent, having heard Mr Hillman today?

Ms Andrews—I have heard Mr Hillman before, so his position and his views are certainly no surprise—we keep in very close contact. The first point I would make is that the Australian Greenhouse Office is the Commonwealth's domestic agency in terms of delivery of policy and programs on greenhouse domestically. The Australian government have taken the position that they do not wish to wait for total certainty, either on the science or in terms of the implementation of a particular international instrument, in order to move on this issue. They believe, both from the point of view of a good environmental outcome and from the point of view of a smooth transition for the economy into what may be a carbon constrained future, that it is important to start now. In fact they started some time ago. I would also make the point that one of the key planks on which this whole domestic response was built was a voluntary program called the Greenhouse Challenge Program. That was a voluntary initiative of both industry and government, and it indicates that it is not just government that believes that capacity building and bringing down emissions in the short run are smart approaches towards the uncertain future that we are currently facing.

Senator LUDWIG—Do you have forward estimates as to the amount of money that you will contribute to the issues that you have just mentioned, like the Greenhouse Challenge, et cetera? You have already spent, as I understand it, a billion dollars, or at least collectively I guess that is the government response.

Ms Andrews—We have the forward budget estimates, which are public and are available. Collectively the government response for over a five-year period is almost \$1 billion committed, not yet spent. You can see through the budget estimates what that money is committed to.

Senator LUDWIG—You are not aware of whether or not there will be a reassessment of that if the Kyoto Protocol is not ratified?

Ms Andrews—There is a reassessment of government expenditure constantly through the budget process.

Senator COONEY—I would like to follow on from what Senator Ludwig was saying. I still do not have a picture of the no doubt important function you perform. You are not directly involved with the convention; you are more directed to getting Australia to move voluntarily towards an approach for doing something about greenhouse internally. Is that a proper description of what you do?

Ms Andrews—Not entirely. I might try to elaborate on that a little bit to give you a better idea. We are involved with the convention in that there are certain obligations that Australia already has under the convention and obligations that we may have under the protocol that the Australian Greenhouse Office is involved in delivering. For example, the National Greenhouse Gas Inventory is an obligation under the Framework Convention on Climate Change. It is the Greenhouse Office that compiles that inventory and reports on it at the international level each year. In addition, we are involved in the measures that the Australian government has chosen to implement at this point in time, some of which are voluntary and some of which are more

mandatory in nature, in order to try to drive our emissions baseline down. We are involved in policy development at the domestic level in particular but obviously also in tying into the international negotiations and advising where the Australian government may wish to go with this issue in the future.

Senator COONEY—Are you in touch with comparable offices overseas? There might not be offices like this overseas.

Ms Andrews—The Australian Greenhouse Office is the only government office in the world fully dedicated to greenhouse response. In most other developed countries elements of greenhouse policy still exist separately in various government departments, although there may be some form of coordination secretariat.

Senator COONEY—Have you got any guidelines that you work by or criteria that you try to meet? That might give us an idea of what you are actually effecting. Have you got guidelines?

Ms Andrews—I am not sure whether we have included this in our submission but in March this year we became an executive agency of government. When the new Public Service Act came in we achieved executive agency status. There is a charter that the government gave us at that point in time for what our activities are, which I am afraid I could not recite here.

Senator COONEY—Thanks for that. We can get that. Is there a criterion that you have that says we are going to reduce gases within a particular period of time?

Ms Andrews—If you are talking about objectives, I suppose the overall objective would be to position Australia appropriately at this point in time to achieve what might be the target in 2008-2012.

Senator COONEY—That is very clear. That gives us a great idea. Is there any criterion that says we are going to reduce gas or increase gas by—

Mr BYRNE—Benchmarks.

Senator COONEY—Are there any benchmarks, as Mr Byrne says, that by the year 2020 we will only have increased gas by so much? Apropos that, have you got any plans to achieve those criteria? I am just trying to get an idea of what the office is about.

Ms Andrews—We talked about the Kyoto target previously and the uncertainty of being able to quantify it exactly, but it is 108 per cent of our 1990 baseline. That would be our overall target to be achieved over the five-year period between 2008 and 2012.

Senator COONEY—So the criteria say that our objective would be to achieve 108 per cent of the 1990 target by 2012?

Ms Andrews—That is assuming ratification of the protocol.

Senator COONEY—In your office that would be written as being the objective that you are after. Have you got any criteria or benchmarks to achieve that? Is there anything that says we are going to reduce gas in the Latrobe Valley by a particular period or grow more trees in Western Australia by a particular period?

Ms Andrews—We have a series of government programs that have been mandated and we have what are really projections for estimated savings out of each of those programs.

Senator COONEY—Those programs were not developed in your office; they were developed by government and they have mandated you to carry them out. Is that correct?

Ms Andrews—Some of them were mandated prior to the establishment of the office and developed prior to the establishment—

Senator COONEY—I can understand that, but you are not developing programs; you are carrying out programs. Is that right?

Ms Andrews—We are currently but we are also advising on forward policy development. If the government, down the road, decides that they wish to change particular programs or they wish to change the mix of measures overall, we would advise on that.

Senator COONEY—So do you develop or not develop the programs? I cannot quite get what you are saying.

Ms Andrews—We do develop new programs. For example, the Greenhouse Gas Abatement Program was mandated through the tax package. We developed the implementation for all of that. We have recently—

Senator COONEY—You mandated the implication but who developed that package? Did you develop and then implement or do you just implement what somebody else works out?

Ms Andrews—That particular program was part of the Measures for a Better Environment package that came out of the negotiations on the new tax package last year. We advised during those negotiations what might be possible programs that could be put in place but the decision was made by the government.

I mention another program that we developed and which we advised the government would be useful to implement which was announced about a week and a half ago, called Greenhouse Friendly/Greenhouse Free. That is a program that is aimed at allowing corporations to offset the emissions inherent in the use of their products. For example, BP announced themselves as our first customer under that program, and they will offset, through investment in abatement projects, the emissions caused by people using their Ultimate fuel in their cars. So that is an example of a new program that we developed and advised to government.

Senator COONEY—So if I went down to the office now, there would be some people working out new policies, somebody else would be working out how to implement them and somebody else would be actually implementing them?

Ms Andrews—Yes. For example, Dr Harrison's team, which comprises only about half a dozen people working on emissions trading, is a policy development exercise in terms of advising the government as to the feasibility, the options and the issues that are involved in the potential implementation of emissions trading. Other teams would be doing things like implementing the Greenhouse Gas Abatement Program, for which we have called for applications. We have had over 100 applications and we now must assess them. Other teams would be involved in things like the legislation that is currently before the parliament with respect to the mandatory renewable energy target.

CHAIR—I have got a few things to clear up. In your opening statement, Ms Andrews, you said that you thought that a carbon constrained world or constraints on carbon emissions was looking increasingly likely. Do you mean that you expect COP6 to be a success? Why do you say that it is 'increasingly likely'?

Ms Andrews—There are two things: firstly, the increasing consensus that has been built up in terms of the certainty of the science underlying climate change; and, secondly, the increasing amount of subscription by governments around the world to the issue. Whether or not it is exactly the international instrument that is currently under negotiation is still a question. Certainly, for example, the World Economic Forum in Davos earlier this year identified climate change as probably the largest challenge facing economies around the world in the first part of this century. The fact that that was spontaneously identified by that conference probably lends weight to the idea that this is not an issue that is a flash in the pan and is going to go away.

CHAIR—Does the IPCC deal with land use and land use change in forestry?

Ms Andrews—It does as well, yes.

CHAIR—It encompasses that. So with respect to our CRC for greenhouse accounting, Graham Farquhar's outfit, their contribution to establishing some objective standards in terms of what is the quantum of sequestration and so forth, is that all part of the IPCC's brief?

Ms Andrews—It is. In fact, the chief executive of that CRC is Dr Ian Noble, who is part of the IPCC and was one of three lead authors on the IPCC's report on land use and land use change.

CHAIR—I do not know if this is a question for Ambassador Hillman or for you, but I wonder what your view is about the effect on non-consenting third parties of a Kyoto Protocol in force, to use a phrase. If other markets with which we trade do ratify it, do you foresee that it would be applied to us even though we had not ratified it in the future?

Ms Andrews—Probably Ambassador Hillman is better qualified to comment from the point of view of international relations in general. I do not personally have a view as to how that might work.

CHAIR—That is, in a sense, post COP6, so I will leave that for the time being. On this question of leakage and cheating and compliance, if you are asking us to put our national interest collectively in the hands of many other signatories or, one day, parties to the protocol, how are we to make sure that people are not cheating? How do you observe land use change? Is

it satellite observed, are there inspection teams, is it reported in each party country voluntarily? Where is the scrutiny of the compliance?

Mr Carruthers—That is a very important and perspicacious question, Chairman. Going back to Ambassador Hillman's introduction, Australia approached the Kyoto conference and the Kyoto Protocol looking for fair and equitable outcomes on emissions targets which the government said at the time, and has said since, it considered were achieved. In order for a target regime to continue to be fair and equitable, we need to understand that everybody is implementing according to the same rules. Hence, national inventories of emissions and sinks become fundamental as the international accounting tool. There is established, through the protocol, agreed methodologies that have been drawn up and adopted through the Intergovernmental Panel on Climate Change and the Conference of the Parties, and they have been built upon with good practice guidance, which has also been accepted. So we do have already in place a number of the key planks of quality assurance in relation to the inventories that countries are preparing, the compliance framework, which Ambassador Hillman was speaking about previously, and the processes for provision of inventories and review of those inventories by expert review teams, much of which has already begun to go into operation under the framework convention. That is really quite important to Australia's national interest in ensuring that not only is Australia applying good practice with its inventory—and we are very confident we are doing that and that we are regarded internationally as doing that, including in the area of land use change and forestry—but we are improving our performance very considerably in that area and we want other countries to do so as well.

CHAIR—Does the draft negotiating text that was developed in Lyons reflects this excellent progress among the parties?

Mr Carruthers—Yes.

CHAIR—This is the draft text. It was done at Lyons two weeks ago?

Mr Carruthers—Correct.

CHAIR—With all its square brackets around words like forest—so there is no agreement on forests and other such things—does this represent the state of the art in terms of the negotiating progress among all the parties? This is the fair and equitable frontier?

Mr Carruthers—Perhaps I could clarify the current status of the negotiations, where I think it was Australia's assessment, and indeed that of other countries as well, that good progress was made in the Lyons session in advancing the negotiations on land use, land use change and forestry. I have touched on already that a good number of parties provided submissions by 1 August concerning their position on what they were looking for as outcomes at The Hague conference on the land use, land use change and forestry item, the sinks item. Australia was among those who made a submission. I do not actually have here a copy of the documents you have in front of you but, by the look of it, they are the draft conclusions, with the first draft of a COP decision and with the co-chairs' text on what the two chairs of the working group that is conducting this negotiation at a working level amongst officials believe captures the sense of the main proposals. What remains to be done between now and the conclusion of The Hague conference is to step up and advance the negotiation on that text. We believe it is a very good

basis for conducting a negotiation. It does include the Australian positions and also includes the positions of other countries. Through the negotiating process, we will need to arrive at an accommodation for agreement in The Hague.

CHAIR—So there is the EU position and there is the umbrella group position. Are they resolved in this?

Mr Carruthers—No, they are not resolved, nor are positions necessarily monolithic in terms of groups. Different parties have, if you like, somewhat different views. Australia has been working very hard, particularly through this calendar year, at forming alliances and working relationships with a whole range of other countries, not only just in the umbrella group. For example, Senator Hill conducted an international sinks forum in Perth in April with a view to trying to step up the pace on these sinks negotiations and build our linkages. So what you have there represents a diversity of positions. There is a greater degree of convergence on some issues. You touched on, for example, the matter of the forest definition. Whilst that at the moment is bracketed, I think at the end of the Lyons session we are actually quite close to an agreed international definition of a forest. I believe that to a large extent we have wide convergence around definitions of afforestation, reforestation and deforestation under article 3.3. There are a few major countries who have quite different positions, but I think we can see that the tide is running forward with prospect for good outcome in The Hague.

CHAIR—It is quite a document and we have only just received it. I should say that, if you were to come back again, given that this does represent the cutting edge of the negotiations and that is where this whole thing sort of starts and finishes for us—we are talking about whether or not we agree to a treaty and this is the part of the body of it—it would be helpful if it was provided to us rather than submissions that assert things. We dig these things up ourselves but, quite frankly, we get an impression from parties that appear before us according to how much information they are willing to volunteer to us and how much we have to dig up ourselves. But, given that these items that appear are crucial to Australia's national interest, we should probably have another session and call other people in Australia, like the NFF or people who might have a view about this, rather than hearing a monolithic view—to coin a phrase. We can do that again and we will give that you the opportunity to come and elaborate on it more.

Mr Carruthers—We are very happy to do that, Chairman. Could I say that we wish to provide all information that is of use to the committee. It is helpful to have some signals about where your priorities and interests lie. You will understand that in relation to the negotiations some of the materials that are around are quite voluminous. We do not believe that, if you like, snowing the committee with paper is necessarily very helpful. But certainly whatever you need we are willing to assist you with. Having had that signal in relation to land use, land use change and forestry, we will make sure you have the key documents, such as the Australian 1 August submission. You now have the conclusion to the session. I would signal that with those conclusions there is a mandate given to the co-chairs to bring forward a revised negotiating text for the beginning of The Hague session. We can supply that to you at the time.

CHAIR—Please, yes—or the web site where it appears. That is sufficient in that sense. As I said, we will be back in Canberra again and we will talk about post-COP6. We now call the witnesses from ABARE. If possible, would Dr Mitchell and Mr Irwin stay for the ABARE submission because questions may arise out of that.

[11.35 a.m.]

FISHER, Dr Brian, Executive Director, Australian Bureau of Agricultural and Resource Economics

TULPULE, Mr Vivek, Research Director, International Trade and Industries Directorate, Australian Bureau of Agricultural and Resource Economics

CHAIR—Welcome. In the same way as before, I have to state formally that these are proceedings of parliament as if they were happening in the House of Representatives or the Senate, so the giving of any false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. That said, would you make a statement and then we will have questions from the committee members.

Dr Fisher—Thanks very much, Mr Chairman. We sent you a short statement plus a number of publications to assist your work. I think you have already heard an excellent round-up this morning from the ambassador about where the negotiations are up to, but perhaps I might just make a couple of follow-up points that I think are worth re-emphasising. First of all, the way in which ABARE have been approaching their economic analysis on this issue is that, given that we have a negotiated set of targets from the Kyoto Protocol, we are concerned to do analysis looking at the way in which that protocol might be implemented and the costs associated with implementation. Most of our work up to date—in fact virtually all of our work up to date—has been focused on the international negotiations rather than on domestic policy issues because we believe it is necessary, first of all, to sort out what mechanisms are going to be put in place internationally before you can do much work with certainty on domestic issues.

Most of our work points to the fact that it will be crucially essential to see the implementation of the Kyoto mechanisms as they were negotiated in Kyoto if we are to minimise the cost of hitting those targets. The reason that cost minimisation is so important, as has already been stated this morning, is that minimising cost means that there is a greater chance that the protocol will be ratified, put in place. Of course, it does not make any sense to put in place those targets and maximise costs. Obviously, you want to minimise the number of economic resources you are putting towards this exercise so that you can use your scarce economic resources in other things that society wants to do.

The other point I would like to make is that in this negotiation it is crucial to think about the implications of the protocol for developing countries. First of all, the G77 plus China make up something of the order of 135 parties in this negotiation. They are the vast majority of parties in the negotiation. Therefore, because we in a UN negotiation deal in consensus, it is important what the G77 is thinking and doing in terms of the outcome of this negotiation. As a consequence of that, it is crucial that we think about what is in the minds of all of those countries, what is driving their interests. That is particularly important if we are trying to do analysis of the likely outcomes of COP6 or COP7.

You might have noted from one of our publications that total emissions from developing countries are likely to exceed emissions from annex 1 countries—those developed countries that

have taken on targets in the Kyoto Protocol—somewhere between 2000 and 2010. So the majority of those emissions by the time we get to the first commitment period will be coming from countries that have not taken on commitments under the protocol and that is why this whole issue about future commitments of developing countries, whatever the form that takes, is so crucial in terms of where this negotiation is going. It is important not only in terms of where the negotiation is going but also in terms of where climate change is going, because, if we have a protocol that only constrains emissions from developed countries yet those emissions are less than 50 per cent of global emissions, clearly we really are not fulfilling the objectives of the original Framework Convention on Climate Change.

Our point there is that it is very important, not only from an economic point of view but also from a negotiating point of view and an environmental point of view, that these issues are dealt with with respect to developing countries. That explains why we have been going to some trouble in ABARE to release one of those research reports you have on the impact of the Kyoto Protocol on developing countries. Since we released that document, we have also had it translated into French, with the assistance of the government of Canada, and the aim there is to ensure that that information is better disseminated to our colleagues and friends in francophone countries because, in particular, African countries who speak French will be one of the major and important groups of countries that have an impact on the outcome at COP6.

Also, in the discussion earlier there was mention of this issue of leakage. It might just be worth my defining for you what leakage actually means because I think there tends to be a bit of misunderstanding about what this term actually means. When economists talk about leakage, what they are talking about basically is the notion that if, for example, you reduce emissions by 100 tonnes in developed countries, and if we have a leakage percentage of, say, 14 per cent, that means that a 100-tonne reduction of emissions in developed countries leads to a 14-tonne increase in emissions in developing countries. Why does that happen? If we take a concrete example in Australia, that happens because much of Australia's aluminium smelting is done with coal-fired power. Coal is the fossil fuel that is the most carbon intensive. In a fossil fuel, carbon constrained world, we would see less coal being used as a consequence of the penalties imposed on that fuel. In other words, it would constitute a lower proportion of fuels going into the Australian energy sector. The consequence would be that we would see an increase in the price of electricity; we would see Australia's aluminium industry being less competitive than, say, an aluminium industry in Brazil that is basically 100 per cent driven by hydro power—not only is it driven by hydro power; Brazil will not be taking on commitments in the first commitment period—and there would be incentives for aluminium production in Australia to move to some place else on the planet that is not constrained by the developed country targets in the Kyoto Protocol. That is basically what emissions leakage is about.

Our estimates of leakage vary, from something of the order of 14 per cent down to eight per cent, depending on what the constraints are on the mechanisms. If we were to see the type of mechanisms arrangement that the ambassador talked about this morning—namely, an uncapped, transparent, full market based system of emissions trading, as we believe we negotiated in 1997 in Kyoto—then our model suggests that we would have a leakage for annex 1 countries as a whole of something of the order of eight per cent. If we were to go to a more constrained arrangement, then that emissions leakage percentage would rise, potentially quite substantially. There is, of course, substantial uncertainty about those estimates. Our model estimates are in the lower range of emissions numbers compared with some others. Some leakage numbers are of

the order of 50 to 70 per cent. We think that is unlikely to be the case, but such numbers do exist. Mr Chairman, that is a quick introduction.

CHAIR—That is good—short introductions and a longer time for questions.

Senator BARTLETT—On this issue of costs to the Australian economy, when you are calculating costs I assume your starting point is that we have to achieve a particular environmental outcome, and then what is the least cost way of doing it—is that correct?

Dr Fisher—Our starting point is that we have to achieve the Kyoto targets specifically. We are analysing this from the point of view of the economic consequence of hitting those targets, so what we do is set up the models to ask the question: what is going to be the cost, under certain policy scenarios, of hitting those targets?

Senator BARTLETT—When you are determining costs under the different models, do you also factor in potential economic benefits? I notice the CSIRO submission talks about some strategies in terms of land use, reducing nitrous oxide emissions, increase to the efficiency of fertiliser use, retiring unproductive land—things like that that actually have net benefits. Do you factor that in and balance that out? And export technology opportunities and those sorts of things?

Dr Fisher—The answer to that is yes and no. The reason I say that is this because, first of all, the model takes account of all the options, as far as we can define them, of course—we cannot factor in absolutely everything, particularly technology that people have not thought about yet; but as far as we can we factor in all of the options that are potentially adoptable to reduce emissions. For example, CSIRO is doing work on the methanogens—in other words, this is the notion that you can reduce emissions of methane from ruminant animals; and that technology is potentially available, depending on how fast my colleagues here do the science and how fast that is commercialised. Those possibilities are incorporated in some of our model scenarios, and what we are doing there is trying to estimate how we can hit those targets that we agreed in Kyoto at the minimum cost. Obviously, you are not going to implement strategies or technologies that do other than hit the minimum cost, so in that sense you are taking account of these benefits and costs that you are talking about.

In a broader sense, we are not doing a calculation about the overall benefit-cost analysis of the Kyoto Protocol itself, so we are not asking the question: is the Kyoto Protocol a good thing on a benefit-cost analysis? We are only analysing the costs associated with hitting that set of targets.

Senator BARTLETT—Okay, so—

Dr Fisher—If I have confused you, I am sorry. When we are doing this analysis, we do not ask the question whether the planet is better off as a consequence, weighing the benefits associated with climate change avoided against the costs associated with hitting the target. We do not do that calculation. What we are doing in these calculations is assuming that we have the Kyoto Protocol and then we ask how much it is going to cost us to hit those targets and what structural changes would we see in economies around the world, what trade effects would we see, et cetera.

Senator BARTLETT—In terms of the political context of someone coming out and saying, ‘It is going to cost us so much,’ and therefore that is used for people to say that that is therefore a bad thing, has there been work done—to put it in the context of the costs of not meeting the targets—on what the cost would be, for example, to the Queensland economy if half the Barrier Reef were lost to coral bleaching and those sorts of things?

Dr Fisher—There is incomplete work done on that. This work is basically called integrated assessment, which is looking at not only the costs associated with hitting these targets but also the benefits associated with climate change avoided. Some of those benefits are very difficult to calculate, obviously. There is a large amount of literature on those issues that we could point the committee to, if that would be helpful. To summarise the broad assessments in that literature very quickly for you, it depends on what countries we are talking about. For example, some of this work suggests that for temperate, northern, developed countries such as the United States and the Russian Federation, two degrees Celsius warming from, say, where we were in 1985 or 1990, is a benefit and after that the costs outweigh the benefits. Why is that? It is fairly easy to understand if you observe, for example, Canadians: how many Canadians in Toronto spend their summers in Miami, Florida? Quite a lot. People like warmer weather. They do not like it absolutely boiling but, generally speaking, the observation is that humans like warmer weather. When you start to take those sorts of benefits and costs into account for developed, temperate countries like the United States and Canada you start to see a situation where humans would prefer slightly warmer climates. However, if we look at tropical countries, this is probably not the case. Nobody in Papua New Guinea wants to see it hotter than it already is or to see more tropical diseases than they already have. So, if we were to do this analysis for Papua New Guinea, it is likely that we would come up with estimates that suggest that extra global warming is a bad thing. This adds a serious amount of complexity to this whole benefit-cost set of analyses because we have got all sorts of equity issues here as well as a lot of uncertainty about how you do these calculations.

Senator TCHEN—My question is actually along similar lines to Senator Bartlett’s. Research results from ABARE are usually quoted to us in terms of that implementation of the Kyoto Protocol, for example, in Australia would result in reduction in GDP by such and such per cent, and so on. You partially answered that, but I would still like to get it confirmed from you that your GTEM model takes into account the impact of forced technological changes.

Dr Fisher—Yes, we do take account of technological change. Of course, we cannot ever take account of the possible serendipity that my colleagues here from CSIRO might stumble upon, and there is always a chance that we will find very cheap ways to produce energy that are not incorporated in GTEM.

The way we take account of this is to make some judgments about the likely increases in what we call autonomous energy efficiency over the period that we are analysing. That is not a bad way of making this assessment, at least for the first commitment period. For example, fuel cell technology is available. We know it is available. It is unlikely, however, that that sort of technology is going to have a big impact before 2012. So we think that the way we have taken account of technology in the model is not perfect but is a reasonable way to do that for the short term. If we were doing an analysis out to 2050, then technology and the way you implement technology in a model like GTEM would be much more problematic. My colleague Vivek

Tulpule can answer you in great detail, if you would like to pursue it, on the exact way in which we incorporate each type of technology in the model.

Senator TCHEN—Before we get to that, perhaps this question should be directed to your colleagues on your left, from CSIRO and DISR. Has there been any feedback on the structure of your model or on the assumptions of your model back to those research organisations' policy departments? Have they taken your assumptions and your output and related that back to their program said, 'Maybe we should do something more to enhance this or to accelerate this or to slow this down'? Has there been any feedback like this, Dr Mitchell or Mr Irwin?

Dr Mitchell—We are aware, in general terms, of the work that ABARE does but we are also coming very much from the point of where we see technological and scientific opportunities. That is what we most feel we have in our vision.

Senator TCHEN—For example, if Dr Fisher's models make a certain assumption about a particular technological change that you have been working on within the 10 years and, say, this has a 10-year lead time before it takes effect, does that change your program? If you look at the result and you say that you cannot wait 10 years, can you accelerate it to five years?

Dr Mitchell—No, we do not have a detailed discussion with ABARE about their results. Also, it is important to bear in mind that science is really only the very first step in the innovation and commercialisation process. There are a whole lot of market forces that exist and that are very powerful beyond the laboratory doors.

Senator TCHEN—What about the department, Mr Irwin? You have an established policy or budget policies which will accelerate the development of a certain technology and not others?

Mr Irwin—The R&D programs that we run tend to be general in nature. To that extent they are a bit similar to CSIRO's approach. Things like the R&D Start Program are based on companies actually making applications, so it is driven by their sense of pursuing opportunities. What we are really talking about here are two rather different things in the sense of our R&D programs or CSIRO's particular activities. You are actually pursuing very much discreet, specific scientific opportunities, and the type of analysis that ABARE is talking about is just looking at the general, across-the-board observed trends in terms of energy efficiency that, for instance, you would assume would apply over the particular period. Certainly within the department there has been no consideration at this stage of whether there is a need to actually accelerate any particular areas of R&D on that basis.

Senator TCHEN—It seems to me that we are facing a situation again where we have the silos. You might wave to each other from on top of the silos but you do not actually communicate all that much or exchange anything.

Dr Fisher—If I might follow up: if we take methanogens as a good example, CSIRO have been working on methanogens for some time. Nobody can help but observe in the market that about 27 per cent of Australia's inventory has come from agriculture. A substantial proportion of that comes from ruminant animals. It is quite clear that a reduction in methane emissions from ruminant animals has the potential to contribute to meeting our Kyoto target. All of that information is published. CSIRO are working on the technology, and Mr Irwin or Dr Mitchell

made the point that science is only one step and that commercialisation, for example, is important. All of this information is out there. I imagine, given that we have quite an active market in Australia, that our friends from the private sector are beating on Dr Mitchell's door looking for this technology. It seems to me that that is really what we should be about; we should be trying to facilitate the market taking up the opportunities associated with Kyoto and exploiting them. That is where we can get a real bang for our buck, rather than inordinate meetings among interdepartmental committees, if I might be so bold as to suggest.

Senator MASON—Dr Fisher, I think I am right in saying from the evidence thus far to the committee that if Australia and the United States ratify the protocol and the developing nations do not accede to those carbon limits—certainly in the first commitment period—there will be two consequences: one economic and one environmental. The economic one is, as I understand it, that there will be a shift in global capital to places where, for example, those carbon limits are not set. I think you said in your oral evidence that there was a leakage of something like eight to 14 per cent. I am not an economist but the factors involved in that would be the technology that Senator Tchen raised, the market for the good being produced—and you mentioned aluminium—and the market for the cost of those energy resources, which are another commodity and also go up and down. How good are your figures? Let me use your example of aluminium. If you were in the United States making aluminium—which is a product that takes an enormous amount of energy—you would want to move it to a developing nation, and let us say across the border to Mexico. That would depend a lot on the world price of aluminium and the other factors of technology and the price of energy. How good are your figures?

Dr Fisher—We think our figures are pretty good basically. Of course I would say that because I would hardly come here and say to the committee that GTEM is—

CHAIR—A bit dodgy.

Dr Fisher—Yes, I would not do it. To be more serious about it though, ABARE has been working on this international modelling for several years. We have had the precursors to GTEM in place since 1995. We have put an enormous amount of effort into doing this analysis, improving the data, collecting the trade data, collecting the prices, collecting all of the emission scenarios that underlie this and collecting information on technology. But with any model, there is still uncertainty obviously. Not only that, these things are very complex. What we have here is a situation where we are talking about changing international prices. We would expect to see the international prices of fossil fuels relative to other goods change, and we would also expect to see the relative prices of various goods change within economies.

Senator MASON—How do you predict the future price of commodities, though? You cannot do that, yet that is part of the equation. If you could do it, you would be a very rich man.

Dr Fisher—Actually, part of my job is to predict the future price of commodities.

Senator MASON—If you can do it, you can make an absolute fortune in the marketplace. I do not mean to be rude, but everyone thinks they can judge what commodity prices are going to be next week. What about the Aussie dollar? Honestly, it is very difficult to guess commodity prices in the future. That is why there are all the hedge funds.

Dr Fisher—First of all, perhaps I could provide the committee with the most recent copy of *Australian commodities* so you can assess whether my forecasts are any good or not. Obviously, making these—

Senator MASON—Dr Fisher, is aluminium going to go up over the next year or down? It is a fair question. It is your example.

Dr Fisher—I am happy to provide the committee with a copy of *Australian commodities*, which we released last week, on our assessments on all of those commodities from apples to zircon. But that is really not the issue here, I do not think, with respect. What we are talking about here is not making forecasts about what is going to happen to a particular commodity next year. What we are talking about—

Senator MASON—But that has to be part of the equation, because if it becomes extremely valuable the price of moving offshore to do your development will be worth it.

CHAIR—It goes to the cost of carbon, doesn't it?

Dr Fisher—Mr Chairman, let me finish. When we are doing this analysis we have what we call a reference case scenario, which looks at the current production and the likely future production, costs and prices for all of these commodities out over the future. Then what we do is ask the question: what will happen, if we change the price of carbon or the price of energy, to those trade flows? That is not about making a forecast about the actual price of aluminium in 2010. It is about asking the question: what is the likely difference between what you would have seen and what you will see in a world where Australian energy prices—for example, from coal fired electricity—are much higher? My assertion is that in that world you will see a movement of aluminium smelter investment from Australia to countries that are not constrained by the Kyoto Protocol—subject, of course, to those countries having equivalent or similar investment arrangements in place.

I do not want to talk about any particular company—I am not in a position to talk about the policies of particular companies. But I would imagine that if you go into the boardroom in Alcoa they will be asking the question: where am I going to locate my next smelter? That decision will be taken on questions about the cost of energy, taxation regimes in those countries, whether their investment is likely to be nationalised or appropriated—

Senator MASON—And the future cost of bauxite.

Dr Fisher—And the future cost of bauxite.

Senator MASON—Can you predict that?

Dr Fisher—But the future cost of bauxite is such a small component of aluminium production—

Senator MASON—All right. But there will be other industries where it will not be. Not everything is going to be as energy conscious, in that sense. The variables are so great.

Dr Fisher—Indeed. The real point about this analysis is that it is the industries that have the greatest intensity of energy consumption that will be affected the most and it is the industries that rely most heavily on fossil fuels that are the most carbon intensive that will be affected the most. I would submit, therefore, that something like aluminium production in Australia will be vastly more affected than, say, services. Provision of economic services will suffer very little as a consequence of the implementation of the Kyoto Protocol, but those people working in aluminium smelters in Australia, I would submit, are in serious jeopardy of losing their jobs.

Senator MASON—I just want summarise that. I do not accept that you can predict, one, technology in the future, which Senator Tchen raised, and, two, the market for those goods, for commodity goods. It simply cannot be done effectively, and if it could be done, there would not be a marketplace for it.

CHAIR—I understand that. We will deal with that, perhaps, in a subsidiary hearing.

Senator MASON—I am afraid there are too many assumptions for me, Mr Chairman.

Mrs DE-ANNE KELLY—I have not had time to read all the submissions that ABARE has made but I look forward to studying them in the future. I do have questions for CSIRO and Mr Mitchell. It was a very interesting submission. I would love to see the 'Xtralia'. Does it work well and how much does it cost?

Dr Mitchell—The what?

Mrs DE-ANNE KELLY—The car.

Dr Mitchell—The aXcessaustralia car?

Mrs DE-ANNE KELLY—Yes.

Dr Mitchell—It is designed as a platform, really, to demonstrate the capability of Australian automotive component manufacturers.

Mrs DE-ANNE KELLY—What does one unit cost?

Dr Mitchell—It is not in production. It is a concept vehicle.

Mrs DE-ANNE KELLY—I notice in your submission you make the point that there are 4,700 gigatonnes of carbon as fossil fuel. Presumably there was a time when they were not fossils, when they were actually living matter. What was the world like then?

Dr Mitchell—It depends on how far you go back. I guess a useful time to consider the world is about 250 million years ago, the cretaceous period, which is the age of the dinosaurs, roughly. It was about five degrees warmer and carbon dioxide concentrations were much higher than they are today, severalfold. That is about as far as you can reasonably draw a comparison with today's climate because the continents were in different positions. So the world has experienced periods much warmer than this, but not during the period of human occupancy on the planet.

Mrs DE-ANNE KELLY—I guess I am going further than that. Obviously the continental plates have moved, as you rightly say, and countries are in different positions from what they were 250 million years ago. But what would be the outcome for Australia? Were greenhouse simply to be ignored and, as you say, there is a five per cent rise in temperature, would we be a desert or a very wet country? What would happen to America? What would be the climate implications? I notice you mention in your submission that there would be more severe tropical cyclones.

Dr Mitchell—We do not actually take our scenarios that far.

Mrs DE-ANNE KELLY—But I would like to know. It is a very important question, is it not?

Dr Mitchell—It depends on whether you think that is a plausible state of affairs or not. I guess we have mostly focussed on looking at somewhere between a doubling and a tripling of concentrations of carbon dioxide in the atmosphere from a pre-industrial base. The sorts of things you can see with confidence are greater warming of Australia in the centre of the continent compared with the margins and greater warming as we go further south. Understanding what might happen to Australia for rainfall, for example, we are quite uncertain about. There is a tendency with more recent climate model simulations to show Australia drying and there is also a tendency to show, even if there are moderate rainfall increases, evaporation greatly exceeding that precipitation. So you could imagine an Australia that is drying out, compared to the present. One of the things that seems to be fairly consistent across the models, and which seems to be seen in the observations as far as we can reasonably rely on information going back through the 20th century, is a tendency for an increase in rainfall intensity. So when rain falls it tends to fall in bigger lumps, as it were. There is quite some speculation about increases in storms and storminess. There is some evidence that this is possible, but it gets fairly speculative.

Mrs DE-ANNE KELLY—By how much would the oceans rise?

Dr Mitchell—The current projections are about 40cms by the end of this century. I want to add, though, that we do not believe that the average rise in sea level is the main issue associated with a coastal impact, for example. What one needs to consider is the whole of the biophysical system, as it were. I will draw a scenario for you: in the event that storms are a little more intense, or rainfall is falling more heavily on a coastal catchment, you can expect to see more water coming down that catchment. Because of the increased storminess, you could also see greater storm surge on the basis of a slightly elevated sea level. That kind of scenario gives you an insight into greater coastal impacts due to inundation and flooding.

Mrs DE-ANNE KELLY—That does not sound like a doomsday scenario to me, though, does it?

Dr Mitchell—I do not believe that we have been either preaching Pollyanna scenarios or doomsday scenarios.

Mrs DE-ANNE KELLY—I am not necessarily referring to CSIRO saying that.

Dr Mitchell—What we are trying to do is describe a physically plausible future and allow policy makers to make their decisions about what they should do with that. The difficulty with this issue through a risk management perspective is that the climate system has lags built into it so that certain changes once they are under way will continue even after you take ameliorative action and also some of the changes are potentially irreversible. That means that you cannot drive the system back.

Mrs DE-ANNE KELLY—I am reminded, though, that all climate change does not bring necessarily a downside.

Dr Mitchell—That is right.

Mrs DE-ANNE KELLY—I just recently took my son snorkelling on the Great Barrier Reef, which we live off, and the biologist was telling us that where we were, 50 miles out to sea, some million years ago was in fact a bare sandstone plain. So the creation of the Great Barrier Reef has come about through warming since that period of time. The oceans have risen and we have now got a reef. I accept the argument, of course, that bleaching of the reef has increased temperatures.

Just moving on to something else, I notice from your figures that in the last decade growth in methane has declined and, in fact, has levelled off. Why is that?

Dr Mitchell—We are not entirely sure. It is more than speculation. The evidence from the atmosphere is that the decline in the growth rate of methane has occurred mostly above about 30 degrees north. That implies changes in the Soviet Union and the Middle East. If we look around us, we can see that there have been changes in the energy sector in the Soviet Union and in the Middle East. Previously in the Middle East they used to just vent methane; now it is mostly flared in the production of oil and natural gas. Also, it is possible that a fairly leaky natural gas system has been improved in the former Soviet Union.

Mrs DE-ANNE KELLY—And all this happened without Kyoto, presumably?

Dr Mitchell—Yes, that is right. Also, methane is much quicker to respond in the global atmosphere than carbon dioxide is.

Mrs DE-ANNE KELLY—You talk about geological sequestration of carbon dioxide—60 gigatonnes potentially in Australia?

Dr Mitchell—Yes, that is a very, very first-cut guess. It has really not been assessed properly at all. We had a geologist working for us and that was his first guess to try and give a sort of feel for what might be possible.

Mrs DE-ANNE KELLY—Sixty gigatonnes is 10 times the emissions of all of the power stations in eastern Australia; is that right?

Dr Mitchell—Yes, it is significantly more.

Mrs DE-ANNE KELLY—That is a lot of carbon. What does it cost to put it underground?

Dr Mitchell—The estimates vary widely but a minimum of, say, \$60 a tonne.

Mrs DE-ANNE KELLY—How does that compare with the sort of prices being talked about for carbon in terms of carbon credits? Perhaps Dr Fisher can answer that? Is that expensive or good value?

Dr Fisher—That actually depends on what sort of arrangements we negotiate in COP6. But there will certainly be sequestration and other options that are cheaper than \$60. Obviously, there are going to be a range of these things. A price of around \$US50 a tonne for carbon in 2010 is the sort of estimate that we have got—subject to assumptions about sinks; if we were to see a much broader outcome on sinks than is currently incorporated in our modelling, we would have a cheaper price than that.

Mrs DE-ANNE KELLY—So we are pretty close to the mark, bearing in mind, as you said, that there is a life to those sinks. You cut down a tree and you release the carbon. How long does this carbon stay underground?

Dr Mitchell—It is one of the things that we would like to be able to assess—that is, the risk of carbon leaching out of whatever geological structure you put it into. You would certainly aim to put it back there for hundreds if not thousands of years.

Mrs DE-ANNE KELLY—Is there any geological risk, such as earthquake activity? Is there any downside that you are aware of?

Dr Mitchell—The potential downsides are that, if there is some sort of geological failure, you get the carbon dioxide coming back to the surface. If you had high elevations of carbon dioxide, you would probably poison whatever was around the place. High levels of carbon dioxide tend to asphyxiate things.

Mrs DE-ANNE KELLY—Thank you.

Senator COONEY—Dr Fisher, later in the day we are going to hear from perhaps Australia's greatest finance minister; he certainly was in the past. He is going to put a case that says we should not be ratifying this agreement. I thought I might have got from you some material which would have enabled me to put something against what he says, but it seems that what you have said will support his position. Had you been approached on these matters before Kyoto itself? Had you done this sort of analysis before Australia went off to Kyoto and signed up?

Dr Fisher—We have been working on climate change issues since the early 1990s, with some more rudimentary models than the ones we have. ABARE has a range of literature going back pre the decisions in Rio that led to the Framework Convention on Climate Change.

Senator COONEY—And the government would have been aware of this work that you had done?

Dr Fisher—Yes. Virtually all of our work is published and publicly available. That is basically the way ABARE operates.

Senator COONEY—Have you done any analysis of any benefits that it might bring to Australia or the world?

Dr Fisher—As I mentioned before, ABARE has not been involved in this integrated assessment analysis that I was referring to—that is, trying to balance the benefits associated with avoiding climate change and the costs associated with doing the implementation. That analysis is actually incredibly complex and difficult. To do that properly, you need lots of money and you need a multidisciplinary team, including scientists, that can provide some of the issues that Dr Mitchell was talking about before.

Senator COONEY—That has never been done at a government level. I remember you saying that before. I thought you meant that was just before Kyoto, but that is the situation right throughout the 1990s—that there has never been such an analysis done.

Dr Fisher—As far as I know, no detailed integrated assessment analysis has been done on Australia. There is no single agency that has the ability to do that at this stage.

Senator COONEY—I do not in any way say this to diminish the outstanding work you have done but, if you are going to close down Portland, I can see that people are going to lose their jobs. In the Latrobe Valley where they have closed down a lot, people have already lost their jobs. Can you follow? It is fairly self-evident. I was wondering whether you know of any economic or scientific analysis that shows what the benefit might be within the terms of Australia. The answer seems to be no.

Dr Fisher—This goes to a broader question about integrated assessment for the planet as a whole. As Gwen Andrews, the head of the AGO, said, Australia constitutes about 1.5 per cent of emissions for the world. As I said previously, before 2010, before the first commitment period, non-annex 1 countries will constitute more than 50 per cent of global emissions. What is happening is that we are inevitably going to have climate change, assuming my colleagues in the science profession are right about the science. Given that it is conditional on that information being right, the emissions are being driven hard by what is happening in developing countries. Climate change is going to happen anyway.

It seems to me that, first of all, we need to decide whether we are going to take this first step, and the first step is Kyoto. The second thing we have to decide is how we engage developing countries and the third thing we need to do, assuming we have done the first two things, is to make a decision about how we implement the Kyoto targets as cost effectively as possible. As I said before, I think it is inevitable that we will have structural adjustment if we implement the protocol. If it enters into force, if we ratify it and it is implemented, then I think it is inevitable that we are going to have structural change in the Australian economy, and that will go to the heart of those energy intensive industries that have formed much of the basis for our exports for many years.

Senator COONEY—I can follow that; I would have thought that was fairly self-evident without 10 years of analysis, with respect. You say it is a global issue, but we have got no global

analysis of how it is going to do good as well as harm in the sense of knocking over industries. Yet without that analysis being done, we seem to have turned up at Kyoto and signed up without any of this knowledge being available to us in terms of how it is affecting Australia and how it is affecting the globe, both for and against the argument of restraining the emission of greenhouse gases into the air.

Dr Fisher—I think those issues have already been dealt with by Ambassador Hillman and Gwen Andrews from the AGO. I do not think I can add anything to what they have already said.

Senator COONEY—Have you ever been asked to try to prepare something that shows the advantages as well as the disadvantages?

Dr Fisher—ABARE has contemplated doing integrated assessment, but frankly, we do not have the resources to do that analysis. I simply do not have the budget cover to do that analysis.

Senator COONEY—Did you go to Kyoto?

Dr Fisher—Yes, I did.

Senator COONEY—Did you point these matters out?

Dr Fisher—My job is to provide economic advice to the government. I have done that and I continue to do it.

Senator LUDWIG—I was looking at one of your earlier papers. I was trying to get an understanding of what your position is in respect of the compliance and associated sanction methods that might be implemented if the Kyoto Protocol is ratified. As I understand it, Ambassador Hillman said that one of the preconditions to ratifying the protocol was an effective compliance sanction methodology or system. One of your ABARE papers seems to highlight that, instead of a compliance or sanction process, if you have an emissions trading regime, you would not necessarily need an effective sanctions or compliance system; that would in fact be the compliance system. Is that where you were going? It seems to be different from the government's position. The government's position seems to be—and they might be able to correct me on this—that they want an effective compliance and sanctions system, whereas you are advocating an emissions trading regime which could effectively replace that. I think that is subscribed to in some of the papers that you have written in the past.

Dr Fisher—There are two separate questions there, I think. First of all, it is not ABARE's job to worry about how international treaties are implemented and international law. That is not our job, so we would rely on the ambassador's and the Department of Foreign Affairs and Trade's advice on those broader compliance issues. With respect to the emissions trading arrangements, it is possible, for example, to imagine a world in which you set up an emissions trading arrangement where much of your compliance is done within the rules that govern emissions trading. That, however, is not yet settled. That is part of the negotiation that we need to go through in The Hague in November because, as part of that negotiation, not only are we having discussions on the compliance process in the broad but we are also having discussions about the arrangements that would govern international emissions trading, the eligibility criteria that would be required before you could participate and when you might be kicked out of an

international emissions trading system. All of those things are yet to be negotiated and obviously there will be linkages from those emissions trading eligibility negotiations back to the broader compliance negotiations.

Senator LUDWIG—When you go to The Hague will you be effectively arguing for an effective emissions trading regime as a mechanism for compliance? Is that what you will be doing in that particular area of expertise? That is what your paper suggests, as I understand it. Is that what you will be doing?

Dr Fisher—Basically, you cannot have an international emissions trading arrangement that works properly if many of the players believe that other players are cheating.

Senator LUDWIG—I am not asking you about what they will be doing. I am just asking you what your position will be?

Dr Fisher—I do not necessarily have a position. My job will be to provide advice to the negotiating team and prosecute the negotiating position which is to be determined, as the ambassador mentioned this morning, before we leave. I will be doing that job when I am in The Hague. Just to add a little bit more detail about the way this might pan out: there will be a debate in The Hague on, among other things, issues like liability in international emissions trading. This is about whether sellers or buyers of permits are liable for the permits that they sell or buy in terms of compliance.

Senator LUDWIG—I can understand that.

Dr Fisher—That debate will be part of this debate about eligibility and also part of the broader debate about compliance. I guess what I am trying to say is that there is a complex set of interactions here and it is not possible for me to predict at this stage where that is going to come out and, therefore, it is a bit hard for me to give you any more insight than I have already done.

Senator LUDWIG—We might leave it until after COP6 then. Thank you.

Mr BYRNE—Who actually funded these particular research projects? There is a list of overall but who specifically funded these research projects?

Dr Fisher—The vast majority of our climate change work is funded jointly by the departments of agriculture, fisheries and forestry, and industry, science and resources, under contract.

Mr BYRNE—And you are saying that the Australian Greenhouse Office did not fund these particular projects in any way, shape or form?

Dr Fisher—No. We do some contract work for the Australian Greenhouse Office but the developing countries book, for example, was funded fifty-fifty between Agriculture, Fisheries and Forestry, and Industry, Science and Resources.

Mr BYRNE—Let me understand this: you have done no costing or have not been requested to do any costing on the cost to Australian business if we ratify the Kyoto Protocol?

Dr Fisher—We have done briefings for ministers in the past, but our principal work up to date, as I said before, has been on the broader international aspects of this. My expectation would be that we will be asked to do more detailed domestic work as we approach ratification of the protocol.

Mr BYRNE—It is a bit like putting the cart before the horse. Given that you are an economic research body, do you find it odd that you have not been asked to do this work prior to actually turning up to ratify? You have done a lot of work after it or leading up to it, but you have not actually done work to get a cost benefit analysis. We are going in there with what might happen afterwards or leading up to it to make life easier to ratify the protocol, but you have not been requested, as I understand it from what you are saying, to undertake a study to look at the cost benefit analysis to Australian business farms and that sort of thing.

Dr Fisher—My expectation would be that, as we approach the debate about the treaty process and the ratification process, we will be asked to do a detailed domestic analysis. In preparation for that—

Mr BYRNE—I am sorry, but in the lead-up to it we have got something here that has been funded which talks about the implications in developing countries and stuff like that. I am glad I am reading *The Kyoto Protocol and developing countries*, but what about *The Kyoto Protocol and Australia*? It just seems almost bizarre that this has not actually been undertaken. There is a lot of work that is being done in the lead-up—in the next couple of months, I presume—but if I understand what you are saying, you are anticipating a request in the next couple of months leading up to these negotiations in November?

Dr Fisher—No, I am not. First of all, there is analysis available in a broad way about implications for Australia in some of our earlier publications, but we have not written a detailed research report on Australia specifically.

Mr BYRNE—Mr Chairman, can we have a look at that? Do you think that is actually pertinent to our inquiry? We have been given a lot of assurances, but the lack of work that has actually been done to have a proper comprehensive assessment in the lead-up to this I find quite staggering. Yet we are supposed to be ratifying this protocol, or seriously contemplating it, next month.

Dr Fisher—No. Mr Chairman, can I clarify that? We are not ratifying this protocol next month.

Mr BYRNE—We are hoping to, if I was listening to the ambassador correctly, or we are in the lead-up to it.

Dr Fisher—No. Let us understand what is happening here. What is happening is that we are going to COP6 in an effort to finalise the negotiations on something called the Buenos Aires plan of action, which was put in place at COP4 in Buenos Aires as a step on the road to allowing countries to ratify the protocol. There are several things that the ambassador has

already talked about that are necessary before the government could contemplate ratifying the protocol. One of those things is doing the negotiations on the way in which you would legally implement the Kyoto mechanisms—for example, emissions trading. There are four mechanisms, but the three that are most usually talked about are emissions trading, the clean development mechanism and joint implementation. Currently, we have something in the order of 163 pages of closely typed negotiating text that represents the point we are up to in these negotiations about implementing the legal arrangements for putting in place the mechanisms. An enormous amount of work needs to be done to take that 163 pages and make it an implementable system to be put in place. So, effectively, what we are doing at The Hague is going through that negotiation on mechanisms, a negotiation like that on sinks, a negotiation on developing country issues and a negotiation on articles 5, 7 and 8 which are compliance issues and the broader compliance issues.

Mr BYRNE—Dr Fisher, notwithstanding that, would you be the body that would be required to undertake a cost benefit analysis?

Dr Fisher—Not necessarily. The government may choose to contract ABARE to do that. But, equally, it might choose to contract others.

Mr BYRNE—It has done that with land clearing, has it not? Isn't there a report where you have actually looked at the costs with respect to land clearing?

Dr Fisher—Yes, we have done some work under contract on land clearing.

Mr BYRNE—Can I assume that you would be the body most likely to?

CHAIR—This is not a contentious thing, really.

Mr BYRNE—No, I did not think so.

CHAIR—Basically, there is a point of contention between you two. You could say, could you, that it is too early to produce a study of the effects of this thing on Australia's economy without further definitional certainty among a hell of a lot of things?

Dr Fisher—Exactly. It is very important that we have a lot more certainty about the way in which the rules will apply before we can do a proper analysis of the impacts on Australia. We need, for example, to come out of COP6 with proper definitions of exactly the way articles 3.3 and 3.4—all of these sinks articles—will work. Until we have that, we cannot do an analysis on the potential implications of sinks for Australia. We would expect to do that work after we see those things defined at COP6 but before Australia goes through the treaty process for ratification.

CHAIR—Yes.

Mr BYRNE—Have you ever provided a briefing to the government about that particular issue? You mentioned a briefing some time ago.

Dr Fisher—We have provided briefings on various aspects of the implications, or the potential implications, of the protocol.

Mr BYRNE—So the government does have some sort of tentative assessment of the potential cost implications?

Dr Fisher—Yes.

Mr BYRNE—I will leave it there.

Mr WILKIE—I have one technical question to Dr Mitchell. You said before that if you buried the CO₂ it would be worth about \$60 a tonne. Just to put that into perspective, how many tonne of brown coal would be burnt? Have you any idea?

Dr Mitchell—I do not have it sitting in my head. That number was what we did for a particular case study. It assumed that you were using a particular type of capture technology off the back of a typical fired black coal power station, transporting it a certain distance and putting it into a geological structure some hundreds of kilometres away—all of that—and then you get that round figure. The capture costs are likely to vary quite considerably, depending on the nature of the power station and the flue gas you have to take it off. It depends on the geological structure you want to put it down to. It depends on whether you need to compress the gas, et cetera.

Mr WILKIE—What I was wondering was roughly how many tonne of coal is burnt to produce one tonne of CO₂.

Dr Mitchell—Coal is about 90 per cent carbon. One tonne of carbon and one tonne of carbon is times 44 on 12.

Mr WILKIE—Of course. Thank you.

CHAIR—I have had a quick look at the conclusions in the ABARE submission and the material that has been provided and there is quite a lot in there that is going to generate more questions. So would you mind if we submitted some written questions within a fortnight or so for you to answer, instead of going on at great length here?

Dr Fisher—Yes, certainly, Mr Chairman. We are happy to help the committee in any way we can.

CHAIR—Thanks.

Senator TCHEN—Dr Fisher, you described developing countries as being Annex 1 countries but in your report you describe them as Annex B. Are there two protocols?

Dr Fisher—This is something that also causes confusion. Annexes numbered in Roman numerals are annexes to the convention. I am sure everybody has one—they are this pink document. Annexes numbered as A, B, et cetera, are annexes to the protocol. Annex 1 countries

are developed countries, annex B countries are also developed countries, but there are some slight differences between those two annexes. For example, Turkey is an annex 1 country but it is not a country that has taken on a target under the protocol, therefore it is not an annex B country.

CHAIR—We will break now and resume with the submission from Peter Walsh.

Proceedings suspended from 12.45 p.m. to 1.37 p.m.

EVANS, Mr Neville Raymond, Secretary, Lavoisier Group

WALSH, The Hon. Peter Alexander, AO, President, Lavoisier Group

CHAIR—Welcome. I formally state that these are proceedings of the parliament, as if they were taking place in the House of Representatives or the Senate chamber, and therefore any false or misleading evidence is a very serious matter and may be regarded as a contempt of parliament. Would you like to make an introductory statement and then we will go to questions.

Mr Walsh—Thank you, Mr Chairman. Firstly, I would like the committee's permission to table a statement additional to that contained in the submission which deals with events that had not happened at the time. I have supplied copies of this to the committee secretary.

CHAIR—Leave to table is granted.

Mr Walsh—I also want to correct an error on page 21 of our submission which states that the cost for brown coal in the slot bunker—which is something close to the minehead, I think—is \$5 a tonne. I am told now it is \$2 a tonne, and at least one member of the committee thinks it is even cheaper than that.

CHAIR—That is in paragraph 1?

Mr Walsh—Yes, paragraph 1 on page 21. I would like permission to change that \$5 to \$2.

CHAIR—We agree to that.

Mr Walsh—Mr Chairman, I was sitting at the back this morning and I did not always hear clearly what some of the other witnesses had said. If I heard him correctly, Mr Hillman agreed that the World Trade Organisation and the rules that govern it should not be regarded as a precedent for the Kyoto Protocol. Again, subject to the caveat whether I heard him correctly, I believe he said that Australia could withdraw from the Kyoto Protocol at any time, without any formal penalty at least.

I have long been concerned about the ease with which Australian governments over many decades have signed international conventions and treaties, and especially when, as in the Teoh case, they are interpreted so expansively by the High Court, ratified or not. I am therefore concerned about the way in which, at some time in the future, this protocol might be interpreted by a court. I have previously tried to have set down by the organ-grinders—that is, by the ministers and not the people who speak for them; the organ-grinders rather than the monkeys—a statement along the lines that any law the Australian parliament has passed it may at any time repeal or amend.

I failed to get such a statement from ministers in the first half of the 1990s although public servants would say the same thing on the public record. It is a point, I suggest, that would be worth the committee following up: to have a clear statement, preferably from all three ministers,

the Attorney General, the Minister for Foreign Affairs and the Prime Minister, that this is not binding in any legal way on future Australian governments. That will not necessarily deter a High Court that takes an expansive view of its powers but it might discourage it to some extent.

Behind the subject matter here—the greenhouse effect—is one hard and verifiable fact: carbon dioxide in the atmosphere has increased by about 30 per cent since about the mid-19th century. On that single hard fact, tier upon tier of conjecture has been constructed: that average temperatures would rise by three degrees centigrade by 2030; that there would be catastrophic increases in sea levels; that there would be massive climate changes and that all of those changes would be adverse. The CSIRO, and the same, with slight variations, is applicable to the IPCC, estimated—I think that is the term that the CSIRO prefers—that in 1988 average global temperatures would rise by three degrees centigrade by 2030. That is the mid-point of the estimate.

More recently, the CSIRO has stuck to the three degrees centigrade increase in average temperature but it has postponed the implementation date to nearly the end of the 22nd century, and not only the CSIRO has done this sort of thing. As this issue has progressed, the early alarmist estimates have been revised downwards by the very people who issued them in the first place, by a half or perhaps more. Most important, or equally important, is James Hansen, who, in 1988, gave evidence to the US Senate about this issue. He is regarded as their principal scientist and he got the ball rolling. It was then picked up very quickly by a politician named Al Gore, who ran with it. In August of this year, Mr Hansen largely retracted the view that he had expressed to the Senate committee in 1988 and heavily discounted the influence of carbon dioxide in whatever is happening to the earth's temperatures, if anything is happening at all.

The next point I want to make is that satellite sensing, which has been around since 1979, has not confirmed that there is an average increase in global temperatures. There is a lot more about this in the submission, of course. Something which it seemed to me could be worth the committee following up is recent correspondence in the *Financial Review* by Mr Scott on 14 September, which was disputed in a letter to the editor by Mr Grant of the Australian Greenhouse Office on 18 September. To that, Mr Scott responded on 20 September, making two points in rebuttal of Mr Grant's AGO letter, that if temperature has increased the increase can be marked from the late 1970s, not the 1950s as Mr Grant had claimed, and that the satellite data does not need correcting for El Nino effects and so on. Both, however, appeared to agree that the satellites could accurately, or with acceptable accuracy, measure sea levels on a global basis. It seems to me that is something that would be worth the committee's while following up. They at least agreed on that but they made contradictory claims about what was actually happening. I am in no position to judge who was correct.

There is, however, a disturbing pattern in the claims, or predictions, that have been made about this issue. The claims of impending disaster—and on page 13 of our submission we go into more detail on the subsequent modification and withdrawal of claims previously made. I understand that you will be hearing evidence in Perth later in the year from Dr Brian O'Brien, who will probably go into this in considerably more detail.

Dr Harrison, who was here this morning, perhaps unintentionally identified a very important additional matter relevant to this issue. Notwithstanding the differences in the precise wording that were expressed at the hearing this morning, Dr Harrison has drawn attention to the very

powerful vested interests that exist, that have been set up—of which, I suggest, the Australian Greenhouse Office is probably one. While I would not go so far as to say that they do not have any interest in the science, there are powerful vested interests inside governments and outside governments who, regardless of what the scientific findings may be or how they may change, will not readily abandon the perks and prestige that the development of this issue over the last decade has brought to them and to the institutions to which they belong.

At the very least, the jury is still out on this issue, even on the basic question of global warming, let alone the alleged catastrophic effects that would inevitably flow from that alleged warming; indeed, much has been substantially discredited. Regardless of greenhouse or carbon dioxide, energy efficiency of course should be pursued as an economic end in itself. But we believe that it is foolish in the extreme to impose changes, which will have major adverse economic consequences, on such flimsy and repeatedly discredited evidence.

No economy is more vulnerable than Australia's to any regime which seeks to withdraw carbon by fiat or by economic penalty. There are two principal reasons for this: firstly, the structure of the Australian economy, most obviously, of course, with Australia being a heavy producer of both alumina and smelted aluminium; and secondly, our population growth, which is, if not the highest, very close to the highest in the First World.

This is very different from the European Union—indeed, it is almost the reverse—and the European 'bubble': in eastern Europe, so-called dirty industries based on brown coal are being phased out for economic reasons—never mind about environmental effects at all; they are being phased out for economic reasons. The population of the European Union is either stagnant or falling, and they will have free access to cheap gas from an impoverished Russia for many years to come, most likely. It is very easy for the European Union to comply with a reduction regime, and it may be to the comparative advantage of the European Union if they can persuade or manoeuvre countries like Australia into sabotaging their own economies by adopting the Kyoto Protocol and sticking by it.

Even if the climatic threat were real, the Kyoto Protocol fails the test of logic imposed by the greenhouse protagonists. Ten years ago, the greenhouse protagonists told us that increasing carbon dioxide had already changed the earth's climate, with the catastrophic consequences, which I mentioned before, which allegedly would flow from it. If that were true, holding emissions in the future to 1990 levels would not stop that alleged catastrophic climate change, let alone reverse it, because 1990 levels got us in that position in the first place, the argument goes, and, therefore, going back to 1990 level emissions, even if that was envisaged—which it is not in the Kyoto Protocol—would not reverse what had happened; it would slow down the alleged further development of those alleged undesirable consequences. The Third World, of course, is not even obliged to accept any of the Kyoto targets and, despite what was said this morning, it is, to say the least, highly doubtful whether the United States Senate will ever ratify it—whether Al Gore is President or not.

It seems to me it would be particularly stupid for Australia to be the first out of the trenches on this matter in implementing Kyoto. No-one, or very few, would be following us, but plenty would be willing to shoot us in the back. What I mean by that is that the imposition of a carbon tax would, as I think Dr Fisher said earlier today, inevitably result in the export of some Australian industries to countries which either are not obliged to do anything under the protocol

or have decided to ignore it. If, as in one of the cases he suggested, that happened to be Brazil where hydro-electricity was used to smelt aluminium, there would be some reduction maybe in global carbon dioxide submissions, but if it went to another country not bound or even within the sphere of Kyoto with a coal based economy the outcome of that would be a net increase in CO₂ production, because these producers are likely to be less efficient than the Australian industry, and the export of Australian industry. It seems to us that that is not a very sensible path to be taking.

Senator TCHEN—My question is a very fundamental question: can Australia afford to go it alone?

Mr Walsh—That is a good point. We have suggested somewhere in the submission that we ought to pull out of it completely. That is probably not a realistic expectation given the degree to which this is involved with politics. But I think a much more sensible and achievable option is to delay, wait for the evidence to accumulate, but above all not jump out of the trenches as the first country in the world to do so.

Alan Oxley, who has considerable experience in this sort of area as an Australian public servant, some time ago suggested that this pattern applied to conventions and treaties globally and has for a very long time. Firstly, countries sign a convention without ever actually intending to implement it. Then they stall and they say, ‘Well, we haven’t implemented yet but we are doing it,’ while actually they are not doing anything at all—the stalling technique. Then the third one is they adopt the Orwellian escape route: they changed the meaning of the words and the clauses that were in the treaty to say, ‘Well, we have implemented this,’ when of course they have not. Cynical though that may sound, I do not think it is far from the truth at least as far as many conventions are concerned, and it would not be a bad path for Australia to follow. But it seems to me that the government is trying to map out the exact opposite sort of path now.

Senator TCHEN—As Ambassador Hillman told us this morning, the minister has already set down three conditions for Australia’s ratification of the Kyoto Protocol. Three issues have to be resolved before Australia would consider ratifying it and there are two associated issues as well, so there are five altogether. As long as the government continues along those lines to negotiate those issues, isn’t the government doing exactly what you are recommending?

Mr Walsh—I think the weakness in that interpretation is that before the parliament still—and passed by the House of Representatives, I understand, in one day—is the renewable energy bill which the government itself says is a critical part of Australia’s agreement at Kyoto. I think it is to be debated in the Senate still. But—particularly after the report of the Senate committee that spent a whole two days investigating that legislation—that does not sit at all comfortably with the view that the Australian government is actually stalling about this. If I thought were true, I would be much less concerned. But for that to be credible, the renewable electricity energy bills should be pulled out of the parliament.

Senator TCHEN—I may have misunderstood you earlier, but did you not say that on an international negotiation level that, because of this very question related to sovereignties and related to the implication of the Kyoto Protocol, we should hasten slowly? But on a domestic front, in terms of our economy, I thought you said that we should be taking action to adjust our economic structure so that we—

Mr Walsh—I am sorry if I gave that impression. Energy efficiency is an economic end in itself and that ought to be pursued, as of course we have been pursuing it for a long time, regardless of any concerns, justified or otherwise, about rising levels of carbon dioxide.

Senator TCHEN—In the case of this Renewable Energy (Electricity) Bill 2000, the actual target is quite modest—two per cent—whereas there is a very strong possibility that such a target may encourage industry to adjust to become more efficient and perhaps to develop new technology which may come in useful as an export technology later on in the century. Isn't that a beneficial policy? If the government were to bring in a renewable bill demanding 20 per cent electricity to be generated by renewable energy, that would be disruptive, but doesn't the modest target help to achieve the increasing efficiency that you are talking about?

Mr Walsh—From our perspective, it is undoubtedly correct that two per cent is not as bad as 10 per cent, let alone 20 per cent, and some people have recently questioned these figures. I am not in a position to argue them here and you do not have the time. But a reliable estimate, sourced, ultimately, I think, from a Victorian government study, is that the two per cent would increase the costs in Australian industry by about \$800 million. I think that assumes use of the cheaper methods of alternative energy, of which apparently the cheapest was woodchips—unless you were going to hydro-electricity, but you are not allowed to do that for other reasons. But, if you look through the submissions and the recommendations by some of the senators who are members of that committee, you find that they want not to take the cheapest renewable energy electricity but to mandate specified proportions for photovoltaic, which is vastly more expensive than the other alternatives, and for wind and so on. I would be surprised if the government accepts those amendments, but that is the direction from which the wind is coming.

Senator TCHEN—Might I change track slightly. Talking about the scientific basis of this global warming scenario, what if the consensus of scientific opinion happened to be right?

Mr Walsh—If the greenhouse activists or protagonists did happen to be right, Kyoto does not stop the problem getting worse. If they are right, the global adoption of the Kyoto target of 1990 will slow down what they claim is a catastrophic emerging problem, but it will not even stop it, let alone reverse it.

Senator TCHEN—But it will give them breathing space, though?

Mr Walsh—The CSIRO's midpoint estimate of a three per cent increase in global temperatures by 2030—and you can perhaps quibble a decade or two about this—has now been put back to three per cent by about 2180. There is no iron law which says that estimate is correct, either; it might be put back even further. There is very much more 'breathing space', to use that term, than it was argued we had when this issue first really got going in the late 1980s.

Senator MASON—My question is just a question of principle. Can we put the scientific evidence aside for a second; I will leave that to my colleagues better qualified to ask those questions. You suggest there are two principal reasons, irrespective of the scientific evidence, for not ratifying the Kyoto Protocol. As you mentioned to Senator Tchen, one is to do with the 1990 baseline being, even within their own logic, insufficient for scientific purposes. The second, and a principal argument that you raised in your submission, your oral presentation here and in your supplementary submission, is that of sovereignty. You even say:

We have seen nothing like the extent of this adventure into imperialism since the days of the Holy Roman Empire.

That is a fairly large claim—

Mr Walsh—But if you read the detail there of what is on the agenda, this month, about the enforcement provisions—

Senator MASON—Can I get to that—that really is the heart of your submission, and it is the question of principle. Not so long ago Mr Thomson organised a session with an eminent American international lawyer. He said, in effect, that treaties were broken down into two sorts. One he described as unenforceable, wishy-washy, human rights treaties, such as the International Covenant on Civil and Political Rights. The principal problem was that the words meant nothing, and, secondly, that there were no enforcement mechanisms. But he said the second group, which were bilateral or multilateral treaties generally relating to defence or to trade, particularly trade, were worth while because they had enforceable enforcement mechanisms. In particular, that helped and assisted smaller countries such as Australia. My question to you is: don't we want a system whereby the European Union, the United States and other countries—much larger entities—are forced to comply so that Australia is not left out in the cold if we go into it? In other words, don't enforcement mechanisms assist us?

Mr Walsh—The European Union might well comply because arguably it is in the economic self-interest of the European Union to comply with this, provided they can get countries like Australia and the United States to comply as well. That is a self-interest argument.

Mr Evans—The crucial treaty which the Kyoto protagonists use as their model is the WTO agreement. As you will find in the submission, a speech was given in Melbourne some months ago by a senior official from Environment Australia in which she quite explicitly used the WTO agreement as the precedent justifying Kyoto in particular but multilateral environmental agreements in general which had trade provisions as their enforcement mechanism. The point about the WTO and its predecessor the GATT is this: it is a totally voluntary organisation; no-one is forced to join; no-one is forced to stay. Australia could leave the WTO within six months or whatever the stipulated period is. The reason why no-one has left the WTO and why so many nations—there is a long waiting queue—are striving to get in is that the WTO agreement provides very real and very substantial benefits to the member states. It provides the rules of international trade, which Alan Greenspan described not long ago as being the major force for global economic growth since the war. But the point remains that nations choose to join and choose to stay because of the benefits, and they accept the rulings of the disputes panels because, even when they go against us, the benefits are still so great.

The point about the Kyoto Protocol is that there are no conceivable benefits that we are aware of from joining or staying, and so those that want to bring this regime into effect—which is a regime of carbon withdrawal or, as the Europeans use the word, 'decarbonisation' at least for the developed countries which are in annex B—want to bring in a regime which, although it will inflict severe pain, or moderate pain or, in the case of the EU, they think hardly any pain at all, it is impossible to leave. That is why the issue of trade sanctions as an enforcement mechanism and the compliance enforcement regime that is under discussion now is only feasible in the long term if trade sanctions can be used as a police power. Otherwise, in the end a nation will say, 'We are not going to cop this.' And because the use of trade sanctions for this

purpose would destroy the WTO—because the WTO was built upon a no-discrimination basis—the issues involved in the Kyoto Protocol are in fact far bigger than just carbon withdrawal. They relate to the continuing survival utility of the WTO agreement itself.

Senator MASON—Thank you for that explanation. But, on that argument, couldn't you say that, if Australia chooses not to ratify, in a sense we will be an international pariah and we could suffer trade sanctions in any case?

Mr Evans—Only if the WTO is destroyed. Our safety in this matter is in not ratifying and using our WTO rights as an instrument to protect us from any trade sanctions. The problem is that if we join Kyoto then it will be read by the WTO disputes panel as: 'Well, you joined Kyoto. You have surrendered your rights in this instance.' There is legal opinion which says you do not really surrender your WTO rights, but I would not want to take that chance.

Senator MASON—Let us assume for a second that the 'existing scientific consensus' is correct and let us also assume that the Australian nation, particularly in the short to medium term, would be a net loser. What about the argument that we should still sign because we are a good international citizen?

Mr Evans—When that point is made, I want to ask: what international citizens are going to vote for you at the next election? To be quite blunt about this, Australia is a democracy with a long tradition of self-government. Our sovereignty and our democracy are inextricably linked; they are the two sides of the same coin. If you, as an elected representative, are prepared to throw away the sovereignty and the forms of self-government which arguably is one of Australia's greatest attributes, one of our greatest treasures, then I think many people in the Australian community will rise up and say, 'We're not buying it.' I do not think you can escape this issue of sovereignty in this situation. We heard this morning about the discussion about compliance and enforcement and 'facilitation'. I have been through all the documents and what is remarkable about them is the degree of obscurity in the language and the fact that they keep on sending you from this paragraph to a paragraph 30 pages on to another document, because they do not want to say in black and white, 'We're going to make you do this.' But in the end, there is so much pain involved in this exercise that, unless there is a police power, unless there is something like the Holy Roman Empire, then the whole thing is going to collapse because, particularly in democracies, the electorates will not cop it.

Senator MASON—I am just wondering whether global capitalism will make up for the Holy Roman Empire, Mr Chairman.

CHAIR—I hope so.

Mrs DE-ANNE KELLY—I would like to go to the question of the science, because that is at the heart of it. I notice that your submission, other than the CSIRO's, is the only submission that deals to any extent with the question of the veracity of the various scientific theories. The executive summary of the CSIRO's submission says:

The surface of the earth warmed by between a half and one degree during the twentieth century. This warming is evidenced in a wide variety of observations.

Could you comment on that statement by the CSIRO and also on your very interesting graphs, which are on page 16 of your submission, showing the comparison between IPCC temperatures in the Northern and Southern Hemispheres and satellite temperatures? I am asking you: who is right?

Mr Walsh—I do not think anybody can honestly assert that they are right, because even if it could be established that global temperatures had increased by what the CSIRO said—whatever that figure was—

Mrs DE-ANNE KELLY—It was one-half to one per cent.

Mr Walsh—It does not automatically follow—even if that was correct and I will come back to that later—that there will be increases in carbon dioxide. The world's climate has been changing for hundreds of millions of years and certainty is very difficult to determine. Indeed, I would say it is impossible to be absolutely certain about what caused what. I am not a scientist, and I am certainly not competent to argue the technical details of it. But you do not have to be a scientist to know the degree to which the CSIRO, among other institutions, estimated changes in temperature, and they have now clawed back most of what they said only a decade ago. They did not guarantee it would happen, but they certainly expressed it with a high degree of confidence that it would happen. Given that record, why should we be confident that what they say today is very reliable when it is 50 per cent away from what they said was reliable only 10 years ago? No-one really knows in the end because there are so many factors at play.

The other point, of course, about the observed temperatures—and it is raised in the submission—is the unreliability of much of the data, which has been collected in the past, because of the urban heat island effect and the unreliability or, at least, doubts about the reliability of recordings that have been taken in countries which do not have scientific meteorological measurement systems, as we have had in Australia for a long time, for example. And let alone, of course, the fact that in Siberia—given the importance of Siberia in some of the interpretations of this temperature data—temperatures were tied to their fuel ration in the days of the old Soviet Union. As it was very cold, they got a bigger allowance for fuel because they lived in a very cold station. There are all sorts of good reasons for questioning the data that is there.

On satellite sensing, I do not think anybody has disputed that, up to date, satellite sensing has not confirmed that there has been any global warming for the last 21 years. That is a limitation that the CSIRO has justifiably pointed out, but if you read the critique that Richard Lindzen made of the CSIRO's submission, which can be obtained from the Lavoisier society, he pointed out that the CSIRO had said that 21 years was too short a period from which to draw reliable conclusions, which I think everybody acknowledges. A few pages on, he says that the CSIRO was using data that was of no longer duration than that. You use the argument when it suits you, and you say it cannot be relied upon when it does not. Another thing, too, that that same CSIRO submission said was that nobody now doubts that carbon dioxide is increasing, that nobody now questions that. Actually, nobody to my knowledge ever did. This is a politician's technique, if you like, of setting up a straw man and then knocking it over. There is, if not more politics than science in this debate in recent years, certainly a lot of politics in it.

Mrs DE-ANNE KELLY—What is your recommendation, then, to the committee?

Mr Walsh—We should pursue energy efficiency, not sign up for anything in international fora and stall it as much as we can. We should pursue energy efficiency as an end in itself.

Mrs DE-ANNE KELLY—Thank you.

Mr Walsh—Regardless of the scientific disputes, if we are looking at self-interest, this threatens Australia more than any other country in the world, probably. So why are we first out of the blocks with renewable electricity bills and making an attempt to get the details of Kyoto sewn up as quickly as possible?

CHAIR—As we have raised this morning, we are committed to an outcome from COP6.

Senator COONEY—Are you saying that there is no risk from global warming in the way it is dealt with in Kyoto or that, if there is a risk, it is not such a high risk that we ought to do anything about it?

Mr Walsh—The proponents have already withdrawn a lot of the claims they were making 10 years ago. Senator, as far as I know, this is still true—the main proponents of the greenhouse threat decline to acknowledge that there could be any benefits from it. Not only is the claim made that the temperature is rising but that every consequence of that will be disadvantageous. That is highly questionable.

Senator COONEY—So the Lavoisier Group would say, ‘If there is a risk, it is not such a risk that would require the world to do anything about it’?

Mr Walsh—There are some things. I do not think that this is seriously doubted by plant scientists. Carbon dioxide in the atmosphere is a fertiliser of sorts. A high level of carbon dioxide—

Senator COONEY—What I am trying to get at is we have had the government go away and commit itself to the extent of signing up in Kyoto and there seems to be, from what I can gather, no reasonable evidence of it doing that.

Mr Walsh—That reflects my opinion, probably—that it should not have been done at that time. But we believe that the evidence is so flimsy that it certainly does not justify agreeing to do things which will, without doubt, do substantial damage to the Australian economy, particularly if we do them in isolation.

Senator COONEY—I am trying not to be political here but the government has spent or committed a lot of money to this. You would say that that was all needlessly expended.

Mr Walsh—I think it is premature at least.

Senator COONEY—What I am trying to get a feel for is what we should say when we are writing our report. Should we say that there is no real evidence of a dangerous build-up of greenhouse gases and therefore we should do nothing about it? Should we say that all we should

do is try to satisfy the world's appetite for making a stand upon a matter that is not really important? What do we say?

Mr Walsh—I think that there are a number of points that can be made. One—and we have made this already—is that, if the full greenhouse disaster scenario is correct, the Kyoto Protocol will not stop it.

Senator COONEY—But how important is Europe to us? They seem to be the conspirators here.

Mr Walsh—It is very easy for the European Union to comply: firstly, because of the bubble—they are regarded as a single unit instead of 18 different nations or whatever they are—and, secondly, because the 'dirty' industries of eastern Europe are disappearing anyway for economic reasons. They were very high emitters of carbon dioxide. The other options that are also of course mentioned are the very high contribution that nuclear power makes to electricity in the European Union and the fact that they have excellent prospects for importing enormous quantities of Russian gas at very favourable prices.

Senator COONEY—Are they the only ones driving it? I have not looked at all of this as closely as I might have. Are the Europeans the only ones that are really driving the Kyoto stuff?

Mr Walsh—Japan apparently takes a similar view.

Mr Evans—There are two major forces behind the Kyoto push: northern Europe—Germany, the Scandinavians and the Brits under John Major—and the United States. Within the United States you have, on the one hand, the EPA—which is a very, very large organisation—acting in concert with environmentalist organisations. They are very keen to establish an international regime. But, on the other hand, in the United States you also have the forces represented in the Senate and the House. My understanding is that, to this day, there is no prospect at all of either the House or, more particularly, the Senate agreeing to any of this. So you have a very much divided nation which, on the one hand, has the White House but, on the other hand, has the implacable hostility of the Senate and the House of Representatives.

Senator COONEY—The picture I have—and I am sure it did not happen this way; and that is perhaps why I am trying to get an explanation from you—is that one day the northern Europeans, in particular, and Japan and some forces in the United States woke up and said, 'Let's have a Kyoto agreement or a Kyoto type agreement so that we can bring even more industry our way.' Would that be the thinking behind it?

Mr Evans—I think Sonja Boehmer-Christiansen's analysis of the historical evolution of all of this is probably the best that I have read. She makes the point that, very early on, the Iranian ministry was very keen to get some leverage after Chernobyl. Environmentalists generally found that cooling—was the phrase they used 'nuclear winter'?—was the big problem back in the seventies. That did not get traction. Then, all of a sudden, the American summer of 1988 was a very hot summer. That is when James Hansen did his thing before the US Senate committee of which Al Gore was the chairman, and it just took off. America is a very political nation. People see opportunities and they went for it very quickly. Senator Gore—as he then was—was a true believer, as his book *Earth in the Balance* demonstrates clearly. So you had a

culmination of things which came together, serendipity wise, to produce a coalition which got the Framework Convention on Climate Change up at Rio in 1992. I do not think you can discount accidents and sudden changes of circumstances—the fact that President Bush at the last minute was persuaded to go to Rio. It was something that was in the balance until the very last minute. All of these things came together to produce the result we now have.

Mr Walsh—Could I just put in a point I neglected to mention before about not just the European Union but the UK. The UK, from 1990 onwards, was phasing out its coal generated electricity to a substantial degree and replacing it with North Sea gas. For economic reasons, other things being equal, carbon emissions were being reduced.

Senator COONEY—We as a Senate committee cannot be expected to know ourselves all the scientific detail or even, in a sense, what goes on in the halls of power around the world. But we are presented with a situation where apparently intelligent and apparently well-informed nations turn up to Kyoto and sign up to this agreement. You say that they should never have done that. But, looking at it from the outside, you have to have some faith in the credibility of the people that turned up there. You can sketch a scenario where they have all turned up as people with evil minds, simple minds or no minds at all—and this sort of thing has eventuated—but it is a big call to ask a Senate committee to say, ‘All these people are way out and weird.’

Mr Evans—Can I respond to that, Senator?

Senator COONEY—Yes.

Mr Evans—I think there is a very good and quite recent historical analogy to that, and that is the Club of Rome report of 1972, which came out of the Massachusetts Institute of Technology. It was sponsored by the Club of Rome, which is a group of high-powered industrialists and other such great and good people in Europe, and for no apparent reason the Club of Rome just took off. Everybody knew that the world was running out of everything that mattered. For example, I recall this particularly, copper was going to run out by the year 1995; tin was going to run out in the 1980s; and gold, of all things, was going to run out in 1991. They built a computer model, they fed in the most basic sort of information like annual consumption, known reserves and annual production, and, bingo, out comes the result: we are running out of everything. Governments took this on. We had proposals to have international cartels of copper producers, and innumerable international—

Mr Walsh—We did have an international cartel of tin producers, which cost us a lot of money.

Mr Evans—All of a sudden, you had hard-nosed bankers pouring money into any mining project that came up anywhere in the world, and, as a result, before long, you had gluts of everything. But the degree to which the Club of Rome—what is the word for running out of everything?

Senator COONEY—I follow that, and that has happened again and again. On the other hand, you have had the problem with tobacco where people said that tobacco did not affect you, and now it does. You have somehow got to look at the consequences. As a responsible committee or as a responsible parliament or government, I do not think we, if there is some risk,

can just simply say, 'We think it can be explained away in terms of people getting on a bit of a hype,' if in fact it is going to occur. In the light of that, do you think there is any risk at all? It really comes down to, I would have thought, risk management, using a more modern phrase. Do we as a parliament or government or as a committee just simply say, 'There's no real risk here, or if there is a risk, it can be managed.' Or do we just ignore it? What do we do?

Mr Evans—If one were to take an Australian perspective and look at the environmental problems that we have within our own borders, and you rank them in terms of severity of impact and the difference they will make to the lives of the people, you would have to say, in my view, that global warming does not rank anywhere. I think the salinity problem of the Murray-Darling Basin has to be right at the top of the heap. Compare the amount of money that we are putting into that with the amount of money that was manifest this morning and you see a very great disparity. The response that I have to your question is: where is the correlation? Where is the balance between real Australian environmental problems and expenditure in money, emotion and energy? It seems to me that the disparity is huge. If members of the committee were to compile their own lists of where Australia has real environmental problems and to rank them, I would be surprised and would find it difficult to believe if the prospect of average Australian temperatures going up by one degree in the next 75 years would rank anywhere on your individual lists.

Senator COONEY—There is one more issue which I would like to raise and which I would like you to take me through. You have said, Lavoisier has said, that the Europeans have got an interest here in protecting their industries, and that they are getting rid of the carbon producing industries in eastern Europe. People might then say, 'But Australia has got an interest in keeping those carbon industries. It is an old economy'—which seems to be the in-phrase these days—'and we want to keep Portland going,' which is in my state, 'and keep Latrobe Valley going.' Just as you say that, if the Europeans take this line—and when I say 'you' I mean the generic you—you would also have to say that the Australian industry has a particular line on this to ensure that it keeps its carbon producing industries. What would you say to that proposition?

Mr Evans—In my view it boils down in the end to the old textbook understanding of comparative advantage. After the war, Australia's comparative advantage was in growing wool, and that is how we made our way in the world. Today, we still grow wool, sugar and other primary products, but a very substantial part of Australia's international comparative advantage is based on very low cost coal and the consequent low cost electricity. Comparative advantage means that we make our way in the world—or, to put it another way, make our contribution to the world's economy—by making use of what we have been endowed with to the best of our advantage, and we have been endowed with this very important resource. With respect to the argument that those who are responsible for exploiting this advantage are talking their own book and therefore are to be discounted, of course, it is true that they are talking their own book, but they are talking a book which is global in its reach. The use of that coal, because of its low price, benefits many more millions of people around the world than just the population of Australia, which is why we have the highest per capita emission of CO₂ in the world.

Senator LUDWIG—Can we continue to emit CO₂ at the present rate, in your view?

Mr Walsh—If Australia assumed the business-as-usual projection—which, of course, is what we have done so far—or adopted the Kyoto, after 50 or 100 years, I think it is, the difference in

the world global temperature, according to the contemporary estimates put out by organisations like the CSIRO and IPCC, would be one-thousandth of a degree. What Australia does on a global scale is almost irrelevant. Of course, that is not the end of the argument; you can legitimately construct an argument about moral obligation. What is being proposed now, given what the rest of the world is doing, goes well beyond moral obligation, anyway. Indeed, I wonder how many years it will take before the Australian government of the day says we are not going to meet the 2010 target. Let us face it: we are not.

Senator LUDWIG—In summary, you say that the CO₂ issue is not an issue at all. Is that what you are telling the committee?

Mr Walsh—It could be. The possibility is there but it certainly has not been proven. It has not been proven on the balance of probabilities, in my view. Of course, it will never be proven beyond reasonable doubt.

Senator LUDWIG—So there is a risk. What do you say that risk is? If you say there is a probability, then you assume a risk. What do you say the risk is?

Mr Walsh—I am not a scientist but it seems to me that there is a possibility that carbon dioxide has caused, or will cause, some increase in global temperature. The evidence to date, though, confirms that only to a minuscule degree—if that. The alarmist estimates of 10 years ago have been largely abandoned by the very people who made them. Rarely, if ever, has it been conceded that there could be gains as well as losses from higher global temperatures.

Senator LUDWIG—Getting back to the issue that I was asking about, do you say that the risk is so minuscule that it does not rate and that we should not worry about it?

Mr Walsh—As I said before, the jury, in my view, is still out and we should follow what used to be called the no regrets policy: certainly, do things, but don't do anything that would massively disrupt the structure of the economy at this stage. We have gone from the no regrets policy to the precautionary principle. If the precautionary principle had been in force a few thousand years ago, the wheel would have been banned!

Senator LUDWIG—Yes, but that is not what I was asking you about.

Mr Walsh—The absurd proposition is that you have to prove beyond reasonable doubt—the criminal standard of proof—that if you do something new there will not be any undesirable consequences: The wheel will compact the soil, won't it, more than human footprints will.

Mr Evans—Can I pick up on Senator Ludwig's question? He is asking: if there is some risk conceded, what percentage do you put on it? I think it is more profitable to ask a different question: of all the conceivable risks—for example, climate, sea level, the state of the globe generally—what are the risks that we can conceive of and rationally talk about? One thing that has amused me over the last 10 years or so is the degree to which the 'meteorite community', the people who study the planetary system and asteroids and related issues, felt—and I think rightly so—very neglected and believed that their risks were totally ignored and that the climatologists had got all of the pot of gold. I am not competent to argue that the risk of a meteorite hitting the earth is far more significant than the risk of a rise in temperature of one

degree centigrade, but it is beyond doubt that very substantial meteorites have hit the earth in the past and have caused huge dislocation. There is not a geologist in the world who would deny that. But the meteorite chaps have totally missed out on the catastrophe agenda.

It seems to me that if you want to go down the road of having, in effect, an insurance policy—taking out insurance against this risk—I would respond by saying, ‘What are all the various risks that we can reasonably rank and give some sort of weighting to in terms of what we should do something about?’ I would have a look at all the candidates, such as those in the meteorite community, and my mates in the icefield who are absolutely convinced that the major catastrophe facing the world is a sudden, catastrophic collapse of the great ice sheets in the Antarctic and some up in Labrador. They have got historical evidence to show that it has happened in the past, that it could happen again and that if it did it would result in all sorts of extraordinary changes to the global currents that have a great deal to do with our weather. They should get a guernsey in this list, too. But what has happened in the last 10 years is that global warming has taken the field; no-one else has had a look in. And I think the meteorite people have got grounds for complaint; they have been totally left out.

Mr BYRNE—Have you ever known of a decision made by government to commit something like a billion dollars—and this is not a criticism of the government—to such a policy, having regard to the quality of the evidence that has been presented?

Mr Walsh—I cannot speak for the government, of course, but it seems to me that, from the government’s perspective, they went this way to appease the green lobby. One minister in the current government once said that ‘appeasing greenies is a bit like feeding a crocodile in the hope that he’ll eat you last.’

If I am correct in guessing that the government’s motive was to appease green pressure groups, it will not work. Appeasement does not work with those sorts of people, and there is no such thing as an agreement. Every agreement is not an agreement; it is the launching pad for the next ambit claim. That is a purely political comment, of course, biased against the government.

Mr BYRNE—Yes, and I did not mean that against the government, because I suspect that would have happened regardless of what government would have been in. If the government wanted what it would call an independent assessment from its departments, what likelihood would it have of getting an independent assessment about the pros and cons of the argument and what course of action it should take with the present infrastructure and some of the witnesses who have appeared before us today?

Mr Walsh—It seems to me that the history of this issue over the last 10 years or so is such that it would be extremely difficult to get an ‘independent’ opinion.

Mr BYRNE—So what should a government do, then, to get an independent opinion?

Mr Walsh—I am not a scientist, but I refer to the recent correspondence in the *Australian Financial Review*, and I do not mean the letters that told everybody last Monday what a bad person I was or the article that wrote that but what went backwards and forwards between Simon Scott and Mr Grant. It appeared to me that they agreed that satellite sensors could, with a fair level of precision, measure global sea levels. I think it is something the committee could

follow up. I do not know what the answer is, but they seem to be in agreement on that. If that is so, that seems to be a very important point—if not about global temperatures, at least about whether the ocean levels are going to rise. They both seem to accept that the sea level could be measured by satellite with considerable precision. One said, ‘It has gone up,’ and the other said, ‘It has gone down.’ I do not know whether that can be answered definitively, but it seems to me that there is some chance that it could be.

Mr BYRNE—We have government departments that are providing infrastructure for making the decision. Is that the general nature of departments, or is this just a particular trend? Is it an example of a trend—an idea that has been seized by government departments that is then explained to politicians—or is this something unusual?

Mr Walsh—I had better not go too far down this path. My own experience in government—and it applies, to some extent, to every government we have ever had—is that a measure of ministerial success is how much you grow your empire while you are running it. An even cruder measure that was popular for quite a while was how much you increased your budget each year—that was a measure of success. The more money you spent, the better minister you had been. I think those are innate to politics. There will be people around who are looking for a bit of self-aggrandisement. It is not unusual.

Mr BYRNE—Shocking!

Mr Walsh—I am not suggesting that is the only thing that is operating, but I think that is always there.

Mr BYRNE—So if you were a departmental head who was independent, what recommendation do you think you would be making to the government at this point in time?

Mr Walsh—Do not commit Australia to anything, at this stage, that we do not have to. I would not, from my own knowledge, be able to delve into the science. One would have to rely on other people there.

CHAIR—Thanks very kindly. It seems likely that we are going to do another round of hearings over the next few months, so you are welcome to make another submission after COP6 and likewise appear at a time that suits both of us.

Mr Walsh—Thank you, Chairman and members of the committee.

[2.44 p.m.]

McKIBBIN, Professor Warwick James (Private capacity)

CHAIR—I welcome Professor McKibbin. Do you have any comments to make on the capacity in which you appear?

Prof. McKibbin—Thank you, Mr Chairman. I am a professor of international economics at the Australian National University, a senior fellow at the Brookings Institution in Washington DC and President of McKibbin Software Group. I am appearing in an individual capacity and nothing that I say should be attributed to any of the institutions with which I am affiliated.

I will be using the projector. While I am waiting for Bill Gates to get his software together I should say at the outset that most funding for my research comes from environmental agencies. I am a consultant to the Intergovernmental Panel on Climate Change as well as to five national governments on climate change issues. My presentation may be somewhat surprising in that context.

Overhead transparencies were then shown—

Prof. McKibbin—Should Australia ratify the Kyoto Protocol? In my opinion, definitely not. Is climate change a problem? In my opinion, possibly. What is the climate change issue? That seems to be the fundamental issue that this committee should first think about. What is climate change? It is fundamentally about designing a sustainable global policy under a great deal of uncertainty. I am sure you have heard about the variety of different opinions that exist in the professional area and in the not so professional area. What should Australia do? Australia, in cooperation with the rest of the world—and that is absolutely crucial—should take out an insurance policy against the possibility that climate change is a big problem. Why is the Kyoto Protocol not a sensible insurance policy? Fundamentally, the Kyoto Protocol targets carbon emissions at an unknown cost for either Australia or the world. Why would you buy an insurance policy when you do not know what the premium is? What does Australia need? What Australia needs, in my view, is a policy that is coordinated across a wide range of countries. Australia should not act alone in implementation. We need to raise the price of carbon, and it needs to be a known increase in the price of carbon. We need clear property rights over carbon emissions. We need to use markets. We need a market based solution that is founded on domestic institutions, I should stress—not international institutions—and one that is flexible enough to adapt to new information about the seriousness of climate change as an issue and about the cost of cutting emissions.

What Australia really needs is to be at the forefront in the race for sensible ideas rather than sticking our heads in the sand and seeking special outcomes in a fundamentally flawed system borne out of negotiated fatigue. What we are actually good at as a nation and why we always bat above our weight in the global political system is that we have ideas. What we should do is to design and advocate a sensible alternative to the Kyoto Protocol that suits our economic comparative advantage and, at the same time, benefits the world. We should be looking after our own self-interest, but in a way in which the whole world benefits. There is an alternative to the

Kyoto Protocol that is in the world's and Australia's interest. This is a proposal that Professor Wilcoxon of Texas and I raised in the Brookings Institution in 1997 and which has been bobbing around at various negotiations ever since then and which will possibly make another re-emergence in the debate given the stalemate at COP6.

What I want to do very briefly in the rest of my time is to focus on what is wrong with the Kyoto Protocol. The problem is that most people stop there: they say, 'It is wrong; do nothing.' I want to suggest it is wrong and there is something better. I want to talk very briefly about the McKibbin-Wilcoxon proposal in that context.

What is wrong with the Kyoto Protocol? As I already mentioned, it is fundamentally based on targets and timetables. But what is the right target for each country? What is the right target for the world? How quickly should we hit those targets? No-one can answer that question, and if they have answered that question they are wrong. Targets are imposing certain guaranteed levels of emissions at an uncertain cost. The negotiators realised that this was a problem and they introduced permit trading to let countries trade with each other to relax their own constraints. That is fine within the countries that are participating, but it does not change the total target. The Kyoto target for annex 1 or annex B countries is given. What they have also done is allowed redefinitions, so that you can use hot air from Russia, you can actually do emission reductions in developing countries and claim credits for that—in other words, you throw away the target if it becomes too hard to meet. To me, that is a very bad policy.

The other set of issues which my research has raised, and which is showing up in IPCC documents as well as elsewhere, is that the permit trading itself is not necessarily a good idea internationally because it can lead to very large political and economic problems because a permit trading system is a wealth transfer system between countries. My research has demonstrated that that might be a big problem or it might be a little problem—no-one knows what is going to happen 10 years in the future.

What else is wrong with the Kyoto Protocol? It is an international system. If you put an international market in it and one country decides to cheat, the entire system will collapse. The price of emission permits in a global economy depends on the demand and supply of permits. What you need, therefore, and what we have seen in volumes and volumes of documents, is a very strong monitoring and enforcement mechanism in all participating countries. If Russia, or some other country, decides not to participate after they have been given the money, then the system collapses unless you can somehow commit the former Soviet Union to stay in the system. How will you do that? What you need is new international laws and institutions. You are creating enormous complexities to address the climate change issue or to work out the low insurance premium that we need. You also do not have developing country commitment in the Kyoto Protocol—a fundamental flaw.

What are the goals of a sensible policy? What should this committee be thinking about in considering the Kyoto Protocol? You do need to have medium-term goals for emissions, not precise targets but a goal. What is our goal? We should guarantee the short run costs. We should know what the price is of the insurance premium that we are buying. We should have developing country commitment but their participation should be without their cost. And we need a system where households and firms can self-insure not only against the uncertainty of climate change but also about the enormous uncertainty from policy makers. What we have

done with the climate change policy is taken a problem of uncertainty and made it worse—nobody knows what any government in any country is actually going to do about it. Finally what you need is a system that will not collapse, where the commitment of a single country will not be destroyed by the lack of commitment of any other country.

What is the McKibbin-Wilcoxon proposal? It is useful to briefly introduce this so you can see how you might want to do it correctly and therefore that you might want to forget about the Kyoto Protocol. Our proposal is an internationally coordinated system of domestic actions. It is not a centralised system, it is a decentralised system. What we do is create property rights over carbon emissions in every country, using domestic institutions and laws in each country. There is no international market in emissions trading at all in our system. This does not sound like an economist speaking, but you will see where the economics comes in shortly. What we are doing in this system is we are guaranteeing the short run costs and we are putting in the long run goals and using the market to price the goals. We have a system where there are no short run costs for developing countries, but there is a binding commitment by them to act and that commitment will depend on their ability to pay. We are using markets to achieve a globally efficient outcome.

It is possible for this particular problem to achieve global efficiency without a global market. In every country we need two markets; therefore, we need to create two assets. Property rights are absolutely fundamental in this entire debate. If you do not establish property rights at the beginning, the system will not survive. The first property right is one that you have probably been talking to various presenters about before my presentation; that is, first of all, you must have an emission permit. This is an annual permit that is required for emitting a unit of carbon within an emission year and it is only valid for one year. This is the short-run constraint on industry. The price of permits in fact will be equal to the short-run cost of carbon. So this is the cost of emitting carbon; the quantity is the amount of emissions that are available in a given year.

The other asset that you create is the emission endowment. The endowment is a perpetual guarantee that will give you an emission permit every year forever. So we have got this very long-lived asset which represents our goal, and we have got this very short-lived asset which represents our cost. In the long run, the number of endowments will be fixed. Just to make what I am talking about clear, endowments and permits are just like the value of a firm. The permit is like the dividend that you get when you hold stock in a firm. So the permit is the one-year dividend and the endowment is the stock market value of the firm. The value of the endowment—the value of the environment, if you like—is the expected future value of the carbon emissions every year. So there is a distinct relationship between the very long-term asset, the value of the firm, and the very short-term asset, the permit.

How does this thing work? It might sound a little complicated but hopefully you will see where I am coming from. With respect to what you give out, you do not give out the permits, you give out the endowments. You start the system by every country allocating an agreed number of emission endowments, and you could start with the Kyoto targets that we have currently negotiated. For developing countries, you create a number of endowments well in excess of what they currently need. So developing countries get a very big pot of endowments; the industrial countries get their Kyoto targets. Each government decides on who gets the endowments within their national border.

My preference, and what I think we should do in Australia, is basically to float the environment: give each person alive one endowment which is a claim over carbon forever, and the rest you can use to compensate energy producers, high fossil fuel content industries and workers in high carbon content industries, because any way that you look at it, if you raise the price of carbon, it will lead to severe structural change in some industries.

The way this works is that it is the energy producers that require the emission permits every year to account for the carbon that they are producing. Where do they get the permits from? They can have an endowment, they can obtain a free emission permit from the government or they can buy an annual emission permit in the domestic permit market. The number of emission endowments is fixed forever. The government has distributed the market trades and the price of endowments is the price of the commitment. However, for emission permits, we want to cap emission permit prices for 10-year intervals, and we argue it should be capped at \$US10 a tonne of carbon. The idea is that we have a fixed price and a flexible quantity in the short run, and in the long run we have a fixed quantity and a flexible price. How do you achieve this? These are both market mechanisms. The number of emission permits in a given year is going to be equal to the number of endowments that you have given out because every endowment generates a permit, plus if the government needed to, the government will supply as many permits as the market needs at \$10 a tonne. But it would only be valid in that year. In other words, the government is allowing the quantity of emissions in a given year to be whatever the market determines it is, given a price of \$10 a tonne for permits. The market value of endowments is going to reflect the expected future price of emission permits, because the endowment generates an emission permit every year.

In industrial countries, the permit price will be \$10 a tonne, because there is going to be a bigger demand for permits than there is for a supply of endowments in the short run, so we know exactly what the price will be for the next 10 years. The endowment market will give us the price in the long run as to how people are thinking about the future commitment of policy makers to the climate change problem.

In developing countries, the price of permits will be zero because there are far more permits in the market in the short term than there will be a demand for permits. As these economies expand, the price will rise to \$10 a tonne. The key thing in developing countries is that, even though there is no cost in emitting carbon in the short run, the endowment market will put a positive value on that country's commitment to the climate change policy, because the endowment market is valuing the potential of this economy in its carbon emission in the future.

So in the medium term, when the developing countries grow to the point where the constraint kicks in, the price will be the same everywhere in the world. That is an efficient outcome. How do you negotiate this after it is set up? Every decade you have a meeting, you agree on the state of climate science and the extent of abatement and you fix a new price. Governments can always intervene if they want to buy back the endowments but they cannot issue any more endowments. To bring it all together in conclusion, what are the key points? The price of permits is going to be known for 10 years at a time. Industry will know exactly what the cost is. It is almost like a carbon tax except that the revenue goes to whoever owns the endowments. You have got very clear property rights, and this is not important because, by handing out the endowments, once the endowments are in the economy, you have created a constituency for binding future governments to remain committed to the goals of the policy. Think of what

would happen in Russia, for example. Once the people in Russia got hold of the endowments, there would be an internal constituency that would hold the Russian government to the policy because, if the government reneged, the value of the endowments would go to zero, and it would most likely be government officials who own the endowments anyway. What you have also done is make a significant reduction in the uncertainty for investment planning. Firms and households can see exactly what the short-term cost is. They know what the long-term cost is because they can see the price in the endowment market. The market is being used to allocate who abates, where abatement happens and what activity changes.

I want to stress that the allocation of endowments is totally different from the acquittal of emission permits. The people who need the emission permits are industry. The people who get the endowments can be anyone you want. In other words, people or firms who own the endowments can be quite different from the small group of firms that will need the permits at the end of each year. In terms of acquittal, you do this at the very top end of the energy generation. Oil, gas and coal producers and owners of endowments have three choices: they can sell a permit each year; they can sell their endowment; or, they can tear up their endowment and put a value on how much they believe the environment is an issue.

What are the advantages? We know the insurance premium. The price of permits and the cost for industry in the short run is the insurance premium. We have locked in our long-run goal. This is absolutely consistent with the Framework Convention on Climate Change. The convention set goals; it never set targets. It was the Kyoto Protocol coming from the Berlin mandate that actually set for the very first time hard targets. That was a mistake. We create constituencies within each country for keeping the policy going—that is, the owners of the endowments. There will be a very efficient economic outcome. The cost of a tonne of carbon is the same in every country. What could be fairer than that? We are also taking carbon out of the future as well as out of the present and it is a lot cheaper to do that than it is to take it out of the current economy. We allow developing countries to increase their emissions. We are providing clear signals to decision makers in developing countries because we have created this in value of their commitment, which is the endowment market.

What we are doing here, basically, is providing information over time when we really do not know what it is going to cost to reduce emissions nor whether we should reduce emissions. We act, but in acting we give ourselves time to collect more information. We are not necessarily going to stabilise emissions unless it is actually very cheap to do so. We get rid of the international trade problems. We are charging the same in all countries. All countries are participating. We do not need international permit trading. The system is flexible. If a country wants to join, all it has to do is set up its own system and use the world price. Basically we have gone from a centralised system to a decentralised system. We have retained national autonomy with known costs. This is enough for the US Congress to participate, in my view, and it is also enough for developing countries to commit. All you need to play the game are your own domestic institutions.

What are the disadvantages? There are a lot of people out there who make profits out of providing financial products to minimise transaction costs associated with Kyoto. They will no longer make the profits out of this because we are getting rid of the costs in the set up of the system. There are a lot of lobbyists out there for direct intervention and subsidies in the climate

change industry who will have to find something else to do because all the profits in our system will automatically go to those who take the action.

How do you make progress at COP6? Very briefly, there are two approaches. The unrealistic approach is to jettison this entire inertial process, adopt our approach and have everyone go home early. The reality is you could continue negotiating—Australia should not ratify but we could continue negotiating. If every country adopted our proposal as an early action proposal, you could start permit trading and endowment trading domestically tomorrow—as long as everybody else did it. Then, if it turned out that we did reach a Kyoto style agreement, all that the government would need to do is to pull out of the domestic permit market and allow international trading of permits and the system could continue. You have to have created all the domestic institutional structures and rules of law and tested them before getting to the final Kyoto outcome. I am happy to take questions on this proposal and talk to individuals later but there are a number of web sites which contain this material. Thank you very much.

Senator TCHEN—I am sure Hansard is sick of hearing the disclaimer that I am not an economist or a scientist or something, but I am certainly not an economist, Professor McKibbin. I must say to you that I do not understand how the system that you are proposing differs from the Kyoto Protocol as we have it. They seem equally complex. But more fundamentally, to put it in simple terms, suppose I find myself committed to the Kyoto Protocol process because I am convinced that continued growth in carbon emissions into the atmosphere is bad for us. Now the question is: how would your system produce reduced emissions? I cannot see any way.

Prof. McKibbin—Senator Tchen, that is a good question. The answer is that the only way you reduce emissions is by raising the price of carbon. We know that will work because we have seen with the oil price shocks of the seventies, the eighties and today that the demand for a product goes down when the price goes up. If you have to pay a known price of \$US10 a tonne for a unit of carbon every time you emit it, you will do everything you can, up to costing you \$10 a tonne, to reduce the amount of emissions that you are making. Secondly, because there is a market out there, if you cut your emissions—suppose it costs you \$6 a tonne to cut your emissions—you can sell your emission permit or your emission endowment to the market today and make \$4 profit on the permit or the present value of \$4, which is likely to be tens of hundreds of dollars on the endowment. There is a profit motive for you to change the amount of carbon that you are emitting. You also know exactly what the cost is. The developing countries will not participate and the US will not ratify because they do not know what the cost is. Under our system, we are guaranteeing the cost so that they know the exact cost.

Senator TCHEN—\$10 per tonne.

Prof. McKibbin—That is our proposal but obviously that would be subject to negotiation.

Senator TCHEN—In that case, why not take the simple approach and say, ‘We put a carbon tax of \$10 a tonne on everybody’?

Prof. McKibbin—Because, if the government levies a carbon tax of \$10 a tonne, the money will go to the government and then there will be an enormous fight about how the government will give away all this extra revenue. Under our system, the money goes to whoever has been given the endowment or whoever has purchased the endowment and undertaken the activity to

reduce emissions and therefore made a profit. It is politically a very different approach to a carbon tax. The outcome is the same. The question is: who gets the revenue? Secondly, it is coordinated across countries, so the price of carbon in Australia is exactly the same as the price of carbon in Europe and in the US. What it actually means, when you look at this in economic models, is that Australia actually produces most of the carbon in the world, because that is our comparative advantage, and this system lets you migrate to the most advantageous location for producing carbon. And that is Australia. In the Kyoto approach, there is a fixed target for Australia and therefore you will not get the industry migration to Australia that you would get under our proposal as long as all countries are participating.

Senator TCHEN—It seems to me that what you are proposing basically has the same caveats as we face with the Kyoto system to start with.

Prof. McKibbin—No, because we know exactly what we are paying. We do not know what the environmental outcome will be. We do not know what the emissions will be in 2010. We have no idea. Well, we do, because you can use my model to find out, but it may not be right. Under this system, we know exactly what the price is.

Senator TCHEN—But that may not be right.

Prof. McKibbin—But we can change it over time. That is the whole point. It is a ‘learning by doing’ proposal. I think Senator Ludwig asked the question, ‘What happens if there is a very serious problem in five years?’ What does the Kyoto Protocol do five years after 2010? What do they do? They renegotiate the entire agreement—the allocation mechanism and all the quantitative targets. Under our proposal, you negotiate one thing and that is the world price for carbon. There is no issue of endowment reallocation because that has already been done.

Senator TCHEN—I am afraid I still do not quite understand, Professor McKibbin, but I am sure other members have questions as well, so I will pass it on and I will think about it.

Senator MASON—Professor, it is hard enough selling Telstra; it would be hard to sell shares in the environment.

Prof. McKibbin—Senator, I am not selling; I am giving it away.

Senator LUDWIG—That is the same trouble with Telstra.

Senator MASON—As a matter of principle, putting the politics aside for a second, is it appropriate that a government give endowments to, for example, 20 million Australians? Is that an appropriate way to allocate a resource—that is, to give it to people living today rather than those born tomorrow?

Prof. McKibbin—The way to answer that question, which is an extremely important question, is to ask: who benefits from the policies that we put in place on climate change today? It will be the generations at least a hundred years from now, because anything we do today is going to take about a hundred years to have any impact whatsoever on the climate. What we are doing is we are putting in place policies, which I think we should do. The pay off will go to future generations. Future generations will be much wealthier than the current generation, under

just about any view of the future, apart from the anti-globalisation view. Therefore, I think it is appropriate to give out today to compensate those people who have made all these decisions under a particular government set of policies. The government, internationally and nationally, has changed the rules, so people have to change the appliances that they purchase, because high carbon usage electricity will now become more expensive. They have to change, so it is worth compensating. Industry will have to change its structure. The aluminium and coal industries and others will have to change. So I think it is only fair to compensate using the endowment allocation for existing people, and the beneficiaries in the future will gain far more from the climate change outcome than any amount of money you can probably sink into today's investments.

Senator MASON—Speaking as a politician, and my colleague Mrs Kelly just said it, we are more concerned about late next year than the future generations. In terms of the saleability of a proposal like this, is there a precedent for it?

Prof. McKibbin—Actually there is not, which is why it has been very hard to explain it to people. In fact there is a lot of interest in it. At least half a dozen countries and all the negotiators at the Bonn meeting 18 months ago were presented with this.

Senator MASON—I think it is fascinating.

Prof. McKibbin—There is an audience out there. There is no precedent in the way we have designed it where we have mixed the fixed price-flexible quantity in the short run with the fixed quantity-flexible price in the long run. There is no analogy that you can come up with to compare it to.

Senator MASON—You said in your written submission and you said it orally, I think, that you have to have some form of extreme enforcement mechanism to hold the whole system together. You would have heard Mr Walsh and Mr Evans before who were concerned about sovereignty. What would you say to them?

Prof. McKibbin—Under Kyoto you need that; under our system you do not. Under our system if the US, Australia, Europe and Japan decide to adopt our system and if some other group in the world decides to adopt it but then pulls out, the only impact is that the amount of emissions in the world will be higher. But the price in our system will not be affected because the price is set nationally in each individual market.

Can you imagine what would happen in the Kyoto Protocol if you encouraged India, for example, to come into the protocol, gave them billions of dollars worth of permits, let them sell them into the world market and then pull out because there was an election next year? The price of permits in the Kyoto Protocol would very quickly go to zero, and there would be an incredible outcry in each country in the world that was participating.

Senator MASON—And then enforcement becomes the principal issue.

Prof. McKibbin—The enforcement is: what do you do to India? Under our system, the enforcement is that those in India who have received the endowments say to the government, 'We had a \$2 billion resource and you're willing to sacrifice it for some short-term political

goal. Forget it! The chances of the internal constituency winning the battle is far greater than any external constituency imposing their will on any country.

Senator MASON—Good luck. Thanks.

Mrs DE-ANNE KELLY—This \$10 per tonne of carbon is the price that you have proposed. Is that correct?

Prof. McKibbin—That is correct. It is in US dollars.

Mrs DE-ANNE KELLY—What does that translate to as a price increase on diesel, for instance?

Prof. McKibbin—I can tell you what it translates to as a price increase in petroleum. I have not looked precisely at diesel. It is \$US10, in 1990 dollars, per tonne, and that is, say, \$A15 per tonne. So it is an increase in the price of petrol of probably 2c or 3c per litre. It is quite a small—

Mrs DE-ANNE KELLY—I did a quick calculation and I worked out 8.3c per litre, but perhaps—

Prof. McKibbin—I am sorry, that was per gallon—I am thinking American. Convert that to litres and it probably is closer to 8c per litre.

Mrs DE-ANNE KELLY—8.3c per litre.

Prof. McKibbin—Approximately.

Mrs DE-ANNE KELLY—Have you bought any fuel recently, Professor?

Prof. McKibbin—Yes.

Mrs DE-ANNE KELLY—So have I—

Prof. McKibbin—In three different countries.

Mrs DE-ANNE KELLY—I buy mine quick smart and keep going. I want to ask you a few other questions about it. You say that governments are hence locked in. So essentially, constituents within your own country, because they have an investment in these endowments, will not allow their sovereign government to opt out of Kyoto, or whatever it is going to be called. Is that so? Is there an automatic lock-in for governments?

Prof. McKibbin—No, the government has to look around at these people and they have to make a decision: do they buy back the endowments they committed to these people to make multibillion dollar investment decisions? They can either buy back the endowments if they want to opt out, or they can just renege and face the political consequences. That is a legitimate thing that the government should consider whenever it changes economic or any other policy, that it

has made a commitment and that people have made decisions based on that commitment. Any firm operating would be under those restrictions, and a government should be under a similar set of rules, in my opinion.

Mrs DE-ANNE KELLY—What is your view, then, on the veracity of the scientific theories about greenhouse gases?

Prof. McKibbin—My view is that there are respectable people on both sides as well as evangelists on both sides, and in no way can I decide who is right or who is wrong. Nobody can decide that, which is why I have designed a policy which deals explicitly with uncertainty. I think the balance of probabilities is that there might be a problem. Therefore, start with what I think is a relatively simple—relative to Kyoto it is simple, believe me—system which starts to increase the price of carbon and then proceed from here. It is a very low risk option, in my view, if the problem is really as serious as some very respectable people think it might be.

Mrs DE-ANNE KELLY—I would just make one comment. I have no doubt that you have put a great deal of work into this and it probably is economically sound. But the members of this committee are pretty representative of their electorates and, with respect, I think it would be a very difficult concept to explain and sell, particularly arguing to your electorate that you were going to impose something that was going to increase the price of their fuel. However, I will be interested to read through it again and perhaps see what is at the base of it. Thank you for your submission.

Prof. McKibbin—Thank you for that comment. I would like to respond very briefly. The comparison is important here. Do we compare it to doing nothing, or do we compare it to the Kyoto Protocol? If we compare it to the Kyoto Protocol, the price of oil will go up by far more than what I am proposing in this. To give you an example, we are saying \$US10 a tonne as the permit price. We have done scenarios where the permit price for Kyoto will be around \$100 a tonne. ABARE have done it anywhere up to \$600 a tonne. If you are worried about \$10 per tonne, consider what would happen if it turned out that we did actually go ahead with Kyoto and were paying \$600 per tonne for carbon. That is a comparison that needs to be taken into serious consideration.

Senator COONEY—I am trying to work out how you would enforce it. Would it be done through the civil courts, if you charged more than \$10 or if there was a dispute about who was entitled to a permit and what have you? What sort of regime would you set up in, say, Russia, the United States, or the Congo, for that matter?

Prof. McKibbin—I am not a lawyer, fortunately, and therefore I have not even dealt with the legal implications. But you would not need a legal system change for this particular policy. I will give the example of when we fixed the exchange rate under the previous system of fixed exchange rates. You can go to the market and buy currency at whatever the market price is; but, under a fixed exchange rate, you can always go to a window of the government and the government guarantees it will sell you a unit of currency at a fixed price. The permit market is exactly the same: if you and I cannot reach an agreement on the price of carbon that we wish to trade, I can always go to the government and buy it for \$10 a tonne. It is exactly the same sort of analogy. So there is no question of a legal problem in the actual day-to-day trading.

Senator COONEY—Say we had a dispute with Finland and I went to the Finnish government and said, ‘You’ve not sold me this under the proper conditions.’ What would happen if the Finnish government—or the Swedish or Chinese government—got into a dispute with me?

Prof. McKibbin—You would only go to the Chinese government to buy a permit for using in China. You would not do it to use it in Australia.

Senator COONEY—I understand that. I will leave it there. Thank you.

Senator LUDWIG—What you are comparing is effectively a Kyoto based scheme as against your scheme. That is the comparison that you are making.

Prof. McKibbin—Yes.

Senator LUDWIG—You still have transaction costs—that is, the current protocol scheme would have transaction costs and your scheme would have transaction costs. Is that right?

Prof. McKibbin—They are of very different magnitudes.

Senator LUDWIG—We do not know exactly what your projection is for transaction costs, do we?

Prof. McKibbin—They are going to be quite small, because all it is, once you have given out the endowments, is a piece of paper, if you are a firm, which you take to the government once a year to get your allocation of permits. It could all be done electronically.

Senator LUDWIG—The ratification of the Kyoto Protocol, and also if there is a tradable market, will bring about compliance issues; in other words, ensure that countries comply. Your system would also require policing, wouldn’t it?

Prof. McKibbin—Internally, yes, but not externally.

Senator LUDWIG—What if the policing was being carried out by, as a bad example, the Russian police?

Prof. McKibbin—Let us do a concrete example just to make it clear. Suppose we take the American system and the Chinese system. Under the Kyoto Protocol, for the Americans to at all value the Chinese permit, which does not say where it is made, they would have to be confident that what is happening in China is just as good in terms of monitoring and compliance as what is happening in the US, because the Chinese are selling their permits into the US market and no-one knows where they are coming from. The American system is being run by American rule of law, with American technology and American compliance. The Chinese system is running under Chinese laws, with much less rigour and much lower compliance mechanisms than they have in the US, primarily because China is a developing country—and the reason it is a developing country is that it does not have the institutions that the West have.

Senator LUDWIG—Yes. I understand all of that.

Prof. McKibbin—Therefore, suppose China does not do it as well and emissions turn out to be really 20 per cent higher than they say they are. What happens to the American market? Absolutely nothing because they are not selling anything in the American market out of China. What would happen would be that the emissions of China would be higher than you would prefer. So the outcome for the environment is not quite so good, but the US do not get affected in their sticking to the actual policy.

Senator LUDWIG—But that has not helped the reduction in emissions, has it? For argument's sake, if you were to take that model and expand it, all developing countries could say that the cost of having a tradable scheme is prohibitive and that it is therefore better to ignore it, or to pay slight attention to it by having both an endowment system and a permit system in operation, but ignore it essentially and continue on their current road as is. Would you then create international tension between developing countries on annexures B and A about what is going to happen, because they would then go back and say, 'That policy didn't work effectively in its aim—that is, reducing carbon emissions.'

Prof. McKibbin—Where you create confrontation is inside the country, because the owners of these endowments will find that the value of their endowments will fall if emissions are actually higher than they really should be.

Senator LUDWIG—But isn't that predicated on a Western democratic system?

Prof. McKibbin—How are you going to enforce it from the West? How will you from the outside force China to stick to the Kyoto Protocol? I do not see how on earth it could be possible.

Senator LUDWIG—We are only talking about yours at the moment.

Prof. McKibbin—Under our system, it is both internal and external. The internal dimension is that there is a market in existence which is pricing the commitment and the ability of the government to deliver on the emission reductions. That is the endowment market. Maybe the endowment price will go to zero and this country will pull out. That is unfortunate, but there will be some countries where that actually does happen. The key thing is that we have set up at least an incentive system and a pricing system which will give people the incentive to get their act together. But, if no country really thinks they want to commit at all, no system will actually deliver the outcome that you seem to be after.

Senator LUDWIG—I am not after any system. I am just examining your system. To put it bluntly, that is all I am doing. You have produced an alternative model that you say will work. I was interested in whether it would work. That is what my questions are aimed at elucidating from you.

Prof. McKibbin—Could I just respond then. The internal constituency is the best I can come up with for how to get countries to—

Senator LUDWIG—I understand that.

Prof. McKibbin—China is a great example where they have been willing to undertake the reform process, using a market system in the south-east that has worked very effectively. Once they have established property rights, which they did early on, it worked beautifully well. Here is a developing country that you would not have thought would have been able to deal with a market system at all, that has done remarkably well with the market system.

Senator LUDWIG—I understand that. Would the initial allocation of the endowment be on a per capita basis, per carbon credit basis, per person basis?

Prof. McKibbin—There are two aspects of that question—firstly, how many endowments does a country get; secondly, how do they give it out?

Senator LUDWIG—No; just how many they get. How they give it out is a matter for them, I guess.

Prof. McKibbin—How many they get is actually done for the industrial countries because they have already had Kyoto. In fact, you could start with that. What you need to negotiate is what developing countries will get.

Senator LUDWIG—For argument's sake, just to give me a concrete example, if ours is 108 per cent, we get 108 per cent of what?

Prof. McKibbin—Of 1990, as faulty as that particular thing is. But we have already locked ourselves politically into certain historical outcomes. You could start again. I would prefer to start again.

Senator LUDWIG—There is no equivalence between one endowment in China or one in Australia?

Prof. McKibbin—No.

Senator LUDWIG—It is internal. Each market is segmented.

Prof. McKibbin—Yes.

Senator LUDWIG—How would you then deal with a car, as a concrete example. I will be brief, Chair. One car emits in the order of a tonne per year but the transport industry in total contributes to about 23 per cent, as I understand it. How do you then deal with a permit for a car?

Prof. McKibbin—We do not need a permit for a car. Where you need the permit is in the industry at the very top of the energy generation. Petroleum refiners need to have permits for every tonne of carbon that is embodied in the petroleum that they are selling.

Senator LUDWIG—And that is where you then get your pricing.

Prof. McKibbin—And the price mechanism will filter it all the way down to the consumer. There are issues of market structure that may cause some price changes that may not be filtering completely through the system. But that is fine. That would just affect the behaviour of consumers. It may dampen the response of consumers but it will increase the response of the industry further up the chain. Who responds is going to have to be a mix of both final demanders and suppliers and how the economy responds to that is going to be a function of the structure of the economy. You will get different behaviour in different economies but you will still end up with a reduction in emissions relative to what they would have been. We do not know whether they will be higher or lower than what is desired because we do not know what is desired. Here we start on the process. We put in place what is required which is a price signal in my view and property rights, and then we proceed to look more closely at the information as it evolves over the next 20, 50, 100 years.

Mr WILKIE—You are saying the units would all be uniform in price to start with across the board. Would you make them in US dollars or in the currency of the country concerned?

Prof. McKibbin—We are making them in 1990 US dollars rather than the domestic currency of each country. We do not want to give countries the incentive to change their monetary policy to affect their exchange rates so they relax their constraint.

Mr WILKIE—That is what I was thinking.

Prof. McKibbin—We have sort of thought about that issue. It is unlikely that a country would be silly enough to do that, but who knows? They are following the Kyoto Protocol a fair bit further than I would have expected.

Mr WILKIE—Okay, so you are basing it on \$US10 a tonne?

Prof. McKibbin—In 1990 dollars for 10 years.

CHAIR—The allocation of these endowments within a national jurisdiction in Australia, for example, has got to be done on some kind of arbitrary basis. You had three categories of people or sectors that would be given them. What happens if I am in one of the energy sectors and I want some more? Can I buy permits from my rivals for higher prices?

Prof. McKibbin—That is exactly the key issue in this whole—

CHAIR—You buy them from the market?

Prof. McKibbin—You buy them from the market. Who puts them in the market? The people who put the permits in the short-term market are either industries which can cut emissions at a very low price—and they will do their cutting and they will make a profit—or the government, which has the window open at \$10. If there is a massive demand in the short run, which I think there probably will be, once the market price hits \$10 it will not go above that, because anyone who wants one can get it for \$10 from the government.

CHAIR—So there is a par value of \$10, if you like, and then there is a tradable market beyond that within the jurisdiction?

Prof. McKibbin—The market price is the price of these endowments. It is the same as the government selling it, and it is the same as the opportunity cost of your production decisions. You can also trade in the endowment market too, which is very important. If you only have a short-term problem, you can buy your permits in the short-term market and if, in the future, you make investment decisions that are less carbon intensive, you do not need to worry about the long term. But, if you make investment decisions that require you to have extra permits every year forever, then you might as well go and buy them in the endowment market now if you want to lock in the cost for your investment. So you have the ability to insure yourself against your own investment decisions and lock in a known price, which is very important for industry. It is also very important for households too. They will be allowed to trade in the endowments as well.

CHAIR—All right. It merits a bit more study from us and we will have to do that at some point. After COP6 there will be some more certainty, hopefully—or there may not be. In any case, if you would like to make another submission, you are entitled to a further comment after COP6. Thank you for today's presentation.

[3.32 p.m.]

LANG, Mr Warren, Acting Executive Director, National Association of Forest Industries

CHAIR—Welcome. Before you give your presentation I must formally tell you that these are proceedings of the parliament, as if they were taking place in the House of Representatives or the Senate. Therefore, any false or misleading evidence is a very serious matter and may be regarded as a contempt of parliament. That said, please make an opening statement and we will question you thereafter.

Mr Lang—Thank you. I am flattered to be invited to appear before the committee. As will be clear from the submissions that I provided you with, I was moved principally by the judgment that the industry I represent is more or less an interested bystander in relation to greenhouse and somewhat bemused to find itself in that position. I am not a scientist but I have placed before you some of the fundamental questions that seem to me to be not receiving a great deal of attention.

In particular, I would like to stress that I am puzzled that the scientific community has not spent more time on quantifying the underlying direction of climate change. The reason that that seems to me to be pertinent to an understanding of what is appropriate by way of a policy response on the part of global governments is that it has the capacity to condition our perception of whether we are faced with a crisis or with a problem. If we are faced with a crisis, then the solutions that governments might decide to resort to would, in all likelihood, be a great deal more urgent than they would be if it were assessed that we were addressing a problem.

Thinking about the underlying direction of climate change, it seems to me that, if we were to pay more attention to that, we might find that there was some link between the underlying direction of climate change and the fact that increased atmospheric concentrations of CO₂—which in earlier evidence it was said are not disputed, and they certainly have not been, as far as I am aware—seem not to be reflected to any great extent in increases in the ocean levels or, for that matter, in dramatic increases in global atmospheric temperatures. I put those forward for the committee's consideration. For the rest, my submission focuses on why it is that the industry I represent finds itself in the position of an interested bystander.

Mrs DE-ANNE KELLY—I am interested in the different accounting arrangements for the death and decay of standing trees and harvest trees which are counted as an emission. Can you comment on that?

Mr Lang—I can only comment to the extent of saying that I do not know why it was ever made. I have asked a number of scientists and a number of officials why that was decided upon, and it seems to be lost in the midst of time. I can surmise that it was because the atmospheric scientists who had carriage of the greenhouse debate in the main in the early days—and by and large still do—were principally interested in quantifying all the emissions. It appeared to them that harvested timber eventually decays and, therefore, ought to be counted as an emission at some point in time, and they decided that, for convenience, they would count it in the year of

harvest. Why they thought that was different from what happens in a forest that is left unharvested, I am not sure. I do not know.

My submission to this committee and over the last five years to government officials has been that there is no essential difference: harvesting brings forward the death of the tree and turns it into useful products, but the trees which were harvested to panel this room and to make these desks were standing in forests which have all regrown, I would surmise. That seems to me to be a happy greenhouse event, by and large. Why then remove the opportunity of creating an incentive for the growing of trees and the use of wood by counting a harvested tree as an emission and extinguishing whatever credit might have accrued to the tree grower when the tree was planted? It has no logic, and I have said so until I am a little weary of saying so, but the committee presented me with an opportunity to say it again.

I have spelt out on page 3 of my submission, numbered 1 to 7, what I see as being the unfortunate consequences of adopting that perspective. There is a further one which I would like to draw your attention to—that is, if it is important to the Australian government that there be an extensive sink establishment such that the benefit of having created those sinks could be taken into account during the first commitment period under the Kyoto Protocol, then it is a bit remiss of the government to overlook the need to create some incentive for that to happen. At the moment there is none. The carbon sequestration deals that have been well reported in the press but which in recent times seem to have come to a standstill, in my judgment, have largely been entered into for public relation reasons. They are not of significant scale and they are not likely to deliver significant benefit.

CHAIR—Just on those plantings, have you any idea of the prices paid? I share your view that I think there is a lot of PR in it, but they were generally blue gum plantations, weren't they, for chipping?

Mr Lang—Some of the agreements that were entered into have no price at all. For example, one of my constituent companies entered into a joint venture agreement with a Japanese trading house which simply agreed that, if there were to be greenhouse benefits from the plantings, the benefits would be equally shared.

CHAIR—So it was signing some right to the Japanese trading house without a price yet determined on it?

Mr Lang—But it assigned the benefits equally between the joint venture partners. It was an unincorporated joint venture, which did not really build into the agreement any expected price or even, for that matter, a real benefit.

CHAIR—Yes. It makes you a little sceptical. To go back to the science and sequestration issues: who is the most reliable academic source for us to ask these things regarding the science of sequestration in wood products and trees and these sorts of questions? We do not yet have a clear picture of who are the reliable academic authorities who are independent—I stress that—of any funding that comes out of greenhouse policy?

Mr Lang—It is hard to find a scientist who is involved or interested in the greenhouse debate who has not benefited in some way from government largesse as far as research is concerned.

We have a number of academics in this country whose judgment I would respect but who nevertheless are recipients of government funding for their research. For my part, that does not reduce the confidence I hold in their judgments and the calibre of their research. I am thinking in particular of the Australians who were involved as lead authors in the special report of the Intergovernmental Panel on Climate Change on land use change and forestry—Professor Graham Farquhar at ANU, Professor Ian Noble also at ANU—and I would have to say the same about other lead authors of that report from other countries. The disappointment that I had with that report is that, whilst it also challenged some of the fundamental precepts that I am objecting to, it did not suggest that they be changed.

CHAIR—I know Graham Farquhar. I went to their workshop a month ago or so. So you are happy from your industry's point of view that we seek opinions directly from them, not through the AGO, about the science of sequestration of carbon?

Mr Lang—Yes, I am.

CHAIR—Bill Burrows in Queensland has had some things to say about the type of forest cover and canopy and so forth. In his view that does not seem to be properly accounted for. How is he regarded in the industry?

Mr Lang—I can only tell you how he is regarded by me, and that is with a great deal of respect. Because it was Bill Burrows who brought to light the fact that, firstly, a lot of the land clearing that has taken place—or is being identified in the National Greenhouse Gas Inventory—is in fact re-clearing of regrowth. It is the clearing of Brigalow and other scrub in rangelands and pasture in Western Queensland, which has been cleared before and has regrown. Burrows was responsible for highlighting the extent of that regrowth, which had previously been ignored in the National Greenhouse Gas Inventory. I would commend him to you as someone that it would be well worth your while to speak to.

CHAIR—He has made a submission and there is an opportunity for him to appear in Brisbane in a couple of weeks time. I think he works out of Rockhampton.

Mr Lang—I think that is right, yes.

Senator COONEY—You take a dispassionate view because your members are not directly encountering the problems that others do. How deeply have you been into it? How deeply has the National Association of Forest Industries been into the issue? Are you giving evidence about what has occurred to you, or have you had some fairly rigorous research done or what? I just want to get some idea of the basis of what you say. Clearly, you are not directly interested in any of this, so it really goes to a question of: how deeply have your association studied it?

Mr Lang—I have given it a lot of thought, because it seemed to me that greenhouse, at one stage, had the potential to get the monkey off the timber industry's back by de-demonising it and by highlighting the environmental benefits of what the industry does. That has not happened to any great extent. We have not commissioned any research of our own, although we are shortly going to do so. The reason we have not is that it seemed to me that the science of sequestration was being adequately and comprehensively studied by, amongst others, the academics that I have mentioned. The IPCC special report on land use change, when it was

commissioned, at least held the promise of bringing together the best research available to shed a lot of light on the question of what could be achieved by moderating, modulating or adapting patterns of land management. I would have to say that that hope was in large measure disappointed. The special report on land use change, to my mind, is a fairly obtuse and complex document which throws up little by way of suggestions about policy and does not adequately highlight the extent of the potential for the industry that I represent to deliver positive greenhouse benefits.

Senator COONEY—It sounds as if you have done a lot of reading yourself and looked at it in depth in that sense.

Mr Lang—Yes, I have, to the extent of my ability to comprehend and understand it. I am particularly struck by recantations, which is why I took the trouble to send you the paper published by James Hansen, who was earlier mentioned as one of the first to alert the scientific community to the hazards that he saw emerging, and who is now saying that he thinks gases other than carbon dioxide ought to command a lot more attention than they have, for two reasons. Firstly, he thinks their impact on global warming is likely to be much more potent. Secondly, he thinks that it is easier to do something effective about those gases than it is about carbon dioxide. That sort of recantation I find very striking.

Mr WILKIE—What benefits or disadvantages do you see in signing the protocol for the forest industry?

Mr Lang—None.

Mr WILKIE—That is it in a nutshell, isn't it; thank you.

Senator COONEY—What were the other gases that were mentioned? What weight was given to them?

Mr Lang—Methane, chlorofluorocarbons, black particles of diesel and coal soot, and the compounds that create the ozone smog.

Senator COONEY—Do any of those affect the growth of forests? Carbon obviously does. Do any of those affect it one way or the other?

Mr Lang—Smog was earlier thought, in the eighties—and probably with good cause—to give rise to acid rain, which had the impact of devastating forests in Europe and in parts of America—mainly Canada, from atmospheric pollution produced in the United States. The Black Forest and other areas affected by acid rain, particularly in Scandinavia, are now recovering as a result of technology introduced to control emissions of sulphur dioxide from manufacturing processes. That has been very effective, and those forests are recovering.

CHAIR—I have a question on a slightly different but, I think, related topic. Many of the state governments have proceeded with new legislation which encourages plantation growth on specially farmed forestry land. What is the industry's view of that? Has that got further to go? For example, the New South Wales act has not been proclaimed yet. Is this coming out of the greenhouse push a bit?

Mr Lang—I think not. It is an adjunct to the progressive closure of native forests, and a desire to offset the reduction in round wood supply by encouraging private land owners to plant trees for commercial forestry purposes. I do not know. I am not up to date on the progress of the New South Wales right to harvest legislation and the impact that that is having. As of 12 months ago, it was known that the average size of lots registered under the right to harvest legislation was something like 11 hectares. If it has not gone up then it is not likely to have a major impact on wood supply. The state governments also had an interest in using greenhouse credits to stimulate plantation establishment, but the abandonment of any contract for carbon credits by the Sydney Futures Exchange is likely to be something of a setback to that.

CHAIR—The plantings are done for proper timber purposes, not necessarily the supply of round logs

Mr Lang—In theory, yes, that is right; but if they are done on such a widespread basis and in such small quantities, then aggregating them into a viable industry will prove to be very difficult.

CHAIR—Yes, I appreciate that.

Senator MASON—Just to summarise, then. Would your view be on the scientific evidence relating to climate change—I will use Mr Walsh's words—that the jury is still out? Would that be your view?

Mr Lang—I would not put a view on that. I have raised some issues of the science that I think deserve more attention, but I would not put myself forward as a greenhouse sceptic. I do not have a view. My view on that is not worth a cracker—it is all too hard.

Senator MASON—You put in Professor Hansen's paper, and I thought you might venture a view—but okay.

Mr Lang—I did, because, as I said a moment ago, I was impressed by the recantation of one of the pioneers in this way. It seemed to me that, if we gave weight to what Hansen said in the first place, we have got to give weight to this.

Senator MASON—I appreciate that.

CHAIR—Thank you for doing that, because I do not think we would have got this from you-know-who. Anyway, many thanks. If you would like to make another submission later after the next stage in the negotiations—this COP 6 meeting in The Hague—by all means do so.

[3.53 p.m.]

COOK, Dr Peter John, Executive Director, Australian Petroleum Production and Exploration Research Centre

JONES, Mr Barry, Executive Director, Australian Petroleum Production and Exploration Association Ltd

CHAIR—Would you like to make any comments about the capacity in which you are appearing today?

Mr Jones—For the record, I stress that, while I am on Dr Cook's board, we are two totally separate organisations and have quite fundamentally different points of view on this subject.

CHAIR—Excellent; it is what we encourage. The reason I asked you to come together was for time and just because it probably is a good idea, given what you have said, that you appear at least simultaneously.

Mr Jones—I do understand.

CHAIR—Dr Cook?

Dr Cook—I am the Executive Director of the Petroleum Cooperative Research Centre. For the record, I am a scientist.

CHAIR—These are legal proceedings of the parliament, so any false or misleading evidence is a serious matter. Who is going to speak first?

Dr Cook—I will, Mr Chairman. I would like to speak briefly about the issue of geological sequestration of carbon dioxide and the implications of this for Kyoto. I really need to start out by persuading the committee that this is for real, because the initial reaction of a lot of people to the idea of putting CO₂ into the ground is that it is quite extraordinary. The way to think about it is that most CO₂ that we use comes out of the ground anyway in the form of coal, natural gas or petroleum and, to some extent, the philosophy we are adopting here is to put it back where it came from. So that is the starting point. I will summarise the main points that I want to get over. Australia's largest potentially useable onshore CO₂ sink is not trees but the deep subsurface. That is a very important point. I believe that the Kyoto Protocol or the mechanisms within the protocol require modification to provide the future opportunity for geological sequestration to be recognised as a valid, quantifiable and auditable carbon sink under the terms of the protocol. And it would be reasonable that, if a future trading regime is developed, geological sequestration should be allowable as part of that trading regime. That is the main point I want to make.

There have been some questions about who is funding the research that people are doing, so it might be useful to put up this slide, not because it is particularly part of this presentation—it is

something from another presentation—but it gives you the range of organisations that are involved in one way or another with this research program. As you can see, a number of major companies in Australia are involved. APPEA is also involved as a sponsor of this program. Also for the record it is very important for me to say that none of the sponsors of the research have in any way had any say in the outcomes of this research; they have been very interested in the outcomes but they have not attempted to influence those outcomes in any way. The other thing I should say about this research is that what I am talking about is research that is under way. We are on the cutting edge of research here, so I do not have all the answers.

In pointing out how important this area is, I will start with how important it is to look at what the carbon sinks are globally. As you can see here, the one we hear most about is terrestrial systems—and let us not worry about the units, just look at the numbers: terrestrial carbon sinks for the world, 100; geological structures, 300 to 3,000; oceans, 1,400 to a very large number. In other words, for the most part we tend to concentrate on the smaller sink. That is no bad thing—it is the sink that matters to us: it is the trees, the grass, the flowers—but it is important to get that message over.

How does it work? Let us very briefly look at geological disposal. Geological disposal can happen in a number of ways in the subsurface. I am not going to go into these in detail but there is a variety of ways in which CO₂ can be trapped in the subsurface. Depending on where you put it, it can remain trapped for 10 years or hundreds of year or thousands of years. One of the important things that we do is to endeavour to locate the places where you can put it in for thousands of years—in other words, this is long-term sequestration. At the present time it is being done, as a sideline almost, in a thing that is called enhanced oil recovery. There are about 50 sites in the world where that is happening at the present time, and most of those are in the United States. We are looking at things such as the use of CO₂ in enhanced oil recovery to a limited degree. We are also looking at it in terms of enhanced coal-bed methane recovery, which is another area. But, for the most part, what we are looking at is putting the CO₂ in what we call deep, unused, saline water saturated, reservoir rocks. I will talk about reservoir rocks for the most part because that is where we can put most of the carbon dioxide.

When I started off I asked, ‘Is this for real?’ This is one example where it is for real. This is happening at the present time under the North Sea. A company called Statoil—along with a number of the other majors, but Statoil is the operator—is actually putting CO₂ into the subsurface. It is stripping the CO₂ out of natural gas and putting it back down into the subsurface. It gets the natural gas from about 2,000 metres below the sediment-water interface and puts it back into a formation that is about 800 metres down—in other words, it is not being put back into the same place. So that is one place where more than a million tonnes a year of CO₂ are being put into the subsurface at the present time.

How does it work? I will not go into the detail. You are looking for the balance with the hydrostatic pressure. The deeper you go into the surface, the more you get the pressure of water and also what we call the geothermal temperature, which is the temperature coming from the deeper subsurface. It is a place where you get conditions suitable for putting CO₂. That zone where you can put it is at about 600 to 800 metres depth.

There are circumstances where you can put it shallower. You have to compress the CO₂ to what we call supercritical state. Once it is in that supercritical state, it has a density of maybe

as much as 0.9. In other words, it is very dense, and you can put a lot of CO₂ into a very small volume. That is what is being done at the one place in the world where it is happening at the present time. We started studying this in Australia about three years ago. We started the actual research about 18 months ago. We believe we have made a lot of progress.

One other thing that is perhaps worth mentioning is that there was discussion about the green lobby. We have had some discussions with them but we need to have more. A view that came out of Greenpeace on this whole thing was:

Greenpeace International opposes the disposal into the ocean of carbon dioxide recovered at the point of combustion from sources like power stations but it does not object to the reinjection technique. It would be logical to eliminate carbon dioxide at a point of production.

That is not necessarily something which should drive this thing but it is a useful starting point so at least you know you are not in head-on competition with the green lobby. They are prepared to look at this as an option.

That is the sort of vision that we have developed. Do not ask me to put a date on this. This is sometime in the future. We developed this vision for Rockhampton and Gladstone where you would not have just the single facility but would have a number of CO₂ generators, a reticulated system and pipelines that would take the CO₂ from the CO₂ generators. You would use it where you could in things such as enhanced horticulture, enhanced coal bed methane or enhanced oil recovery. But, ultimately, you are going to have to get rid of most of that CO₂, quite frankly. You would do that using the single point of injection, or a group of points of injection, into the right soil structure. That is the vision of thing.

To tackle this we are looking at what we call ESSCIs. An ESSCI is an environmentally sustainable site for CO₂ injection. We have studied 49 of these so far in Australia. We have risked their capacity to contain CO₂ safely. We have got some quite extraordinary numbers out of this in terms of the potential significance of it. We have just on 49 of these and we have a number to go.

There has been a suggestion that we should be planting a million hectares of plantation trees to help the CO₂ situation for Australia. That is probably a very reasonable thing to do for a whole stack of reasons. But, in fact, the capacity of these 49 geological sequestrations sites is 10,000 times more than that of a million hectares. Planting a million hectares of trees is quite an undertaking.

Just to give you an idea of the scale of these things, they could have the capacity to absorb all of Australia's CO₂ production for the next 1,000 years. These are caricatures in many ways. I am not suggesting that we have to do this but it is very important for you to understand the scale of these things. It is also very important for me to stress that these are indicative figures. They have not been subjected to full review. That is the sort of thing we will be doing. I am just giving you some insights into this research. It is also important to stress that we do not know what the cost of this will be yet. We are looking at this but we do not know the cost. It is very important to stress that. There is an exploration program on these things. I will not go into exactly how we do it but that is what you do.

What about the costs of these things? All I can do is give you published costs so far that have been bandied about. We need to look at these for Australia. We have started to look at these for Australia. But we do not know to what extent overseas figures are going to be relevant to the Australian situation. TNO is a Dutch organisation; their figure is \$10 a tonne for getting rid of CO₂. That is a published figure. The IEA have recently published a figure where they say it could be \$4 or \$5 a tonne—that is their figure, not ours. We have looked at the numbers—and it is really important to stress that they are very, very preliminary numbers. We have come up with an envelope of values—\$10 to \$25 a tonne, depending on how far you have to pipe it and all that sort of thing. There are a lot of uncertainties there. It also depends upon the tax regime, which could have a major impact on this whole thing, and so on.

It is also important to stress that capture and separation costs are pretty high. In the case of the LNG industry, they have to separate out the CO₂ anyway, so we are starting at the, in some ways, easy end of things in terms of that side because that has already been done. We are working quite closely with the LNG industry with this one. If you start going to conventional thermal power stations, then the cost of separating out the CO₂ ranges anywhere from \$20 a tonne to \$70 a tonne, based on present technologies. Again, a lot of work is being done on this.

In conclusion, I have not had a chance to touch on every facet of this, but Australia is going to need to have a range of options to meet its Kyoto targets. There is more work to be done on the technologies, the economics, the risk assessments, the sequestration times and so on as far as geological sequestration is concerned, but the preliminary results from the work of the APCRC is that geological sequestration could prove to be one of Australia's most significant sequestration options. We believe it is important that the Kyoto rules allow us to optimise this and to gain the maximum benefits to Australia from geological sequestration.

At the present time, as I said earlier, the only way you get carbon credits and so on is through having a Kyoto forest. What we are suggesting is that it is very important indeed that the future allows for this potential option to be developed for Australia's benefit. There are various reasons why we think Australia has more to gain than most countries from this option, but again let me stress that we have got to do a lot of work at the present time on the costs of this whole thing. But we believe that it is a very important technique that needs to be fully evaluated by Australia. It could have quite profound implications for our whole approach in this area.

Mr WILKIE—I thought that was very good. I suppose we already have a lot of natural gas platforms that already have those arrangements in place where we could inject it if we just introduced a bit of different technology and equipment?

Dr Cook—It is very important to stress that this is not a trivial thing. It involves a lot of money and quite a lot of technology. It not just a matter of taking the thing up there and sticking it back down there. As I say, the only place in the world where it is being done at the moment is from a platform. We have a number of companies that are in with our consortium that are looking quite closely at this and looking at its implications to the Australian LNG industry.

Mr Jones—One other consideration that you have to take into account is that the offshore platforms are designed to take certain weights and certain volumes of equipment on them. We are not talking about small-scale equipment in doing this. Just dropping it onto an existing platform may in fact render the thing unsafe. You would be putting on either too big a weight or

too big a volume. So you might actually be talking about putting in a totally separate engineering structure to make this work. Even in engineering terms, it may not be simply dropping another piece of machinery onto an existing platform.

Mr WILKIE—Certainly it sounds like it has got potential and should be worth investigating.

Mr BYRNE—What do Australian and overseas companies spend per annum on oil and gas exploration these days?

Mr Jones—Can I take that on notice and come back to you tomorrow or the day after.

Dr Cook—It is round about a billion, but that is not the definitive figure; APPEA needs to give you that.

Mr BYRNE—Could that be potentially jeopardised by us if, say, theoretically, we unilaterally ratified the Kyoto Protocol?

Dr Cook—A concern of the LNG industry was certainly what the impact of Kyoto would be on that industry. It is a very long-term industry and it has to make decisions that are going to result in production in 30 years time or something like that. It has got to know what the regime is going to be that applies at that time. Part of being involved in this sort of study is to minimise their risks and know what the options are in the future. So the answer to your question is yes, it could jeopardise it. They would like to minimise that risk.

Mr BYRNE—It is difficult. I know that in mining there is a very large lag time, particularly with respect to exploration and then bringing mines on stream. I presume it is the same within the oil exploration and gas exploration industry. Where is their thinking at the moment with respect to this? I notice you have touched on this briefly in your submission. But what is their thinking with respect to this? What sort of potential strategies are they undertaking? Is this a strategy that you are putting forward in anticipation of what may happen?

Dr Cook—Ours is just one part of the strategy. I think Mr Jones should perhaps answer that in the broad.

Mr Jones—It is not a simple question. Separate oil and gas, for a starter. In today's world, if you find oil, you produce it straightaway. At \$US35, \$US30, \$US28, \$US25 a barrel, it is a nice cash flow item. So the lag between finding oil and producing oil is relatively short. On the other hand, in Australia we tend to find gas more often than not. Gas depends on a market to produce it. The reserves that we are now talking about developing for the expansion of the North West Shelf project, for example, have been known for the best part of 20 years. Even if we sign the contracts at the end of this year—and that is a high likelihood—it will still be another five years before LNG will start moving to Japan. So just on that one project alone you are talking about something like 20 to 25 years lag between gas being discovered and gas being delivered to a market. Some of the gas in the Timor Sea has been known for 10 years. It may be another five years before it is brought onshore in Australia. So for gas there is a much longer lag than there is for oil.

Yet from a greenhouse point of view, getting gas into the market is fundamentally important because it is the least CO₂ intensive of all the fossil fuels. At the end of the day—it does not matter what the scientists say or what the policy makers say or do—for the next 20 to 25 years, the world is dependent on fossil fuel, no matter what. There is no other alternative.

Mr BYRNE—Say, for example—just on a theoretical basis—there was oil off the Indonesian coast, or oil companies suspected that, and Indonesia as a developing country was not subjected to these sorts of considerations: would an oil company be more inclined to spend their exploration dollar there or in Australia? It is a little bit like mining companies with respect to land rights issues, as I understand—although it is not an appropriate analogy in some ways. I am aware of mining companies saying, ‘Thank you. We don’t have these considerations in Indonesia or Russia’—or something like that—‘so we will choose to spend our exploration dollar there.’

Mr Jones—All of the things being equal and the only difference being whether there is a greenhouse cost impost in Australia and not one in the other country, you would take your exploration dollar either for oil or gas to the other country. At the end of the day, it is the difference between cost and price and where you put your investment that matters. Any company aims to maximise the return to its shareholders. If there is a lesser cost impost in one place than another and therefore a bigger gap, you will go to the other place.

Mr BYRNE—So if we took the step of just racing forward—as Estonia has done, as I understand it—and ratifying the protocol, would that be something that the exploration companies, oil and gas, would have serious concerns about?

Mr Jones—Fifty-three per cent of Australia’s energy comes from my members and, like it or not, we are going to be reliant on them for a long time. If you look at Kyoto, a number of things are fundamentally wrong with it. One, it is competitiveness distorting. Thirty-seven countries have an obligation; 120-odd have no obligation. The greater part of the oil and gas in the world is in the 120, not in the 37. Therefore, there is a distortion to start off with that is inherent in the structure of the treaty. The politics of the situation are such that probably the biggest oil and gas producer in the world is in the group of 37—the United States has the greatest uncertainty about whether it will or will not ratify. If it does not ratify, you have another fundamental competitiveness distortion in the equation.

The issue of time lags is not considered in the document, nor is the issue of adapting to change versus adapting to emissions. So we have a focus on things that are happening now which will not have a greenhouse effect for another 30 to 50 years and where we are acting whereas the things that are going to happen in the next 30 to 50 years are being ignored. Again, that is a competitiveness distortion. Finally, technology changes of the type that Dr Cook is talking about are just not covered by the ambit of the document. From our point of view, there are some very fundamental flaws in the drafting, even though the emission allocation which Australia got in Kyoto was fundamentally better than what we thought we would get two days before it was agreed to. So it is a good outcome in terms of what we got; it is a fundamentally flawed and unworkable outcome from the point of view of competitiveness and investment.

Mr BYRNE—With respect to the department’s consultation process with you, what generally happens? How are you consulted?

Mr Jones—Firstly, consultation implies that what you say is listened to and that, when you say something, you get a reaction to it. We do a lot of talking about greenhouse with various parts of a number of governments. Sometimes we are listened to. The cabinet decision of 22 August is a good example of our being listened to. That was a fundamentally important step in terms of at least giving the Australian resources and energy sector some degree of certainty about the timing and the nature of change with regard to greenhouse. That was listened to. There are other times when we make representations when we wonder whether we are listened to.

Mr BYRNE—So do you think you are being listened to on this particular issue?

Dr Cook—It is early days yet. It is important to point out that a couple of government organisations are involved in this. The AGO has sponsored some of this research along with the oil companies that are part of the consortium. It is quite interested in what is going on. It is true to say that, so far, the opportunities for geological sequestration have not figured prominently in the agenda of the AGO, and it would probably be fairly open about that. We have endeavoured to bring a fairly open sort of approach to this and to show through the research whether it is or is not relevant.

Our research has actually gone towards the stage of saying it is really quite relevant and perhaps more than we anticipated when we started this, quite frankly. We still have some way to go in terms of talking with governments. We are about to set off on a trip to talk to all the state governments on this and to tell them where they are because there are potentially long-term implications in terms of licensing arrangements and so on. You cannot just have anybody putting CO₂ in the ground. You have to know where they are putting it and whether it can safely be put there. There are all those sorts of things. There is a regulatory regime that, ultimately, is going to have to be brought about and some of the states are starting to think about that. When it is offshore, of course, it is then a Commonwealth regime. There are a lot of implications which start out on the road of talking with government, but we still have a way to go on this one.

Mr Jones—We would take the view with regard to Peter's research that, even if it fails and is shown not to be practical and economic, it was still fundamentally important to undertake. Comprehensiveness is probably a word you have heard used a lot already. You must cover all sources, all sinks and all policy options. If you do not explore all the policy options, you run the risk of running into the high cost category when you have a low cost one you have excluded. Saying, 'This doesn't work,' tells you something about your suite of options. If on the other hand it works and it works in an economic way, then the sorts of figures Dr Cook had put on the board suggest that the whole suite of things that we ought to be doing in Australia would be fundamentally different.

Mr BYRNE—Coming back to a couple of concerns that you raised specifically, are they concerns that you have articulated to the government with respect to the protocol and some of the concerns that you have in particular about that? What sort of response have you had when you have raised those concerns?

Mr Jones—All of those concerns we, as APIA and as part of collections of various combinations and amalgamations of industry, have raised with government repeatedly almost since day one. Some of them about comprehensiveness and trade distortion, even before Kyoto,

were being raised with government. Are they being listened to? I would say, in some quarters, yes, because one of the fundamental points of the cabinet decision of 22 August—which for those of you who are not in the government does match up largely with things that opposition spokesmen have been saying—was maintaining the competitiveness of Australian industry and not sacrificing Australian jobs and Australian investment in regional development. Those sorts of words which were in the opening paragraph of that cabinet decision are words which have almost bipartisan support right across the parliament. The government endorsing them—or re-endorsing them in the case of some of those words—is a recognition that they are listening to these sorts of things.

Senator COONEY—How far have you gone with the work you are doing overseas? In other words, what I am getting at ultimately is whether or not there is a consciousness being created with the Kyoto countries about these alternative methods that they have not, as I understand what you said, taken up as yet.

Dr Cook—From 1990 to 1998 I was overseas, and the organisation that I run overseas started working on some of these things. When I came back to Australia in 1998, I could see the opportunity and felt it needed to be grasped here, too. We have now actually leapfrogged a number of the organisations overseas. We put a lot of effort into this and quite a lot of talent. This has enabled us to link in with international networks, which is a very important part of this.

Over the period that I have been involved in this business, I have seen an extraordinary growth of interest in it overseas. For instance, up until two or three years ago, the US Department of Energy was not that interested. They are now putting a lot of money into this. They are now starting to get very interested indeed. This is why it is very important for Australia to also be engaged in this, because certainly the United States says, ‘We’ve solved it; this is the way you’ve got to go.’ We have got to be in a position as a country to be able to say, ‘That’s all very well for the United States but it doesn’t work here.’ Or, alternatively, we may want to say, ‘Actually, that’s damn good, because it works really well here. So we have no problem with adopting it.’ Linking in with international networks is really very important.

The players in this are the United States, the European Union, Japan, Canada and ourselves, and these are the only countries putting effort into this these days. I would say that we are right up there with the leaders. I saw a recent thing coming out of the oil industry. The oil industry is now starting to set up its own consortia and the first organisation they wanted to interact with in this area was our CRC. So I think we are well regarded in the quality of the research that we are doing, and I think we are gaining from that.

Senator COONEY—When the parties come together—I think the next one is in The Hague—have you any expectations or hopes as to whether this will be taken up by the parties, or do you think it will take a little longer than that?

Dr Cook—We are not part of a government advisory system and all we can do is inform people about this and hope that they will pick it up. I think it is quite important that it is picked up by Australia. I am not absolutely confident at this stage that it will be, but that is part of the reason why I am here: to say that this is something we as a country need to look at because, potentially, we have more to gain than most other countries.

Mr Jones—You may be aware that there has just been a major international negotiation leading up to The Hague that has just finished in Lyons, in France. I think what comes out of that part of the negotiation is that anyone who thinks they are going to get an amendment to the protocol at The Hague meeting is in cloud-cuckoo-land. Changing the words in The Hague is going to be almost an impossibility. The real question is: ‘Can we make Kyoto work in The Hague?’ Can we address the uncertainties over key mechanisms, over compliance and over liability? Can the practical working mechanisms that we need to resolve before we know whether or not we have got a treaty that works be sorted out between now and the second or third week of October, when The Hague meeting starts? On the basis of what has happened in the last few weeks, the odds would have to be that the answer to that question would be no, or exceedingly low, so anyone like us who might want to change one of the clauses to add one or more words has got, in the short term, little chance, I would suggest.

Senator COONEY—Where do the parties meet after The Hague?

CHAIR—There are meetings of subsidiary bodies; it will never stop.

Senator COONEY—Dr Cook, what would be against it if a country wanted to adopt this method of getting rid of its carbon dioxide? I am really asking you to put counterarguments, I suppose, or to put the arguments that you have had to address as counterarguments.

Dr Cook—Obviously there is a potential problem of cost. That is one thing we have got to recognise. Aside from that, it is not an allowable mechanism in terms of carbon credits and so on. It is not included. It is not a Kyoto forest so it does not actually count from that point of view. It may be that if you could persuade whoever is going to look after this sort of thing that in fact you have got a closed system and that what is happening is that the stuff coming out is going along a tube and going down, so it never gets out into the air. They may say, ‘That’s all right; that doesn’t count.’ On the other hand, it is not at all clear that that is going to be the situation within the present regime. So our view would be that there is a need for clarity on this issue. Our view would also be that, from the point of view of auditing, it may well be that it is easier to audit a tonne of CO₂ in the subsurface than it is to audit a tonne of CO₂ in a tree, quite frankly.

Mrs DE-ANNE KELLY—You have made it plain that the Kyoto Protocol does not recognise geological sequestration. What reason have they given for the reluctance to do that?

Dr Cook—You are seeing that science has moved along. It has moved faster than the capacity of the international community to modify the rules. That is one of the problems. When the discussion started on Kyoto, people probably did not consider this an option. It does not quite have the same ring as trees either. Let’s admit it: it does not look as green. It may ultimately be. If we can prove it is securer and cheaper then, in reality, it is greener. I think that is the reason.

Mrs DE-ANNE KELLY—Thank you for outlining that. Who would pay for those were that to be part of Kyoto allowed emissions trading?

Dr Cook—Ultimately, the community has to pay the cost to increase prices or whatever. That is what it is about. Then you make the decision on the basis of which is the cheapest mechanism

for getting rid of your CO₂. If this is cheaper than a tree—and in some circumstances it may be—then you would use this in preference to a tree. It is horses for courses.

Mr Jones—Let us just assume for a second that Dr Cook's method is the cheapest way of disposing of CO₂. I should confess at this stage that I am an economist. It is questionable whether that makes me a scientist. If it is the cheapest way, two things follow. Firstly, energy prices in Australia will not go up by as much as they would have gone up with any of the other options. Secondly, in an international emission permit-trading system we will be able to dispose of CO₂ and create potential credits for ourselves at a faster and better rate than any other country. Therefore, we should be able to sell credits to other countries and have an income flow into Australia. If it turns out to be the cheapest option, or a cheap option, then it is potentially beneficial to the community and to the nation as well as to the power companies, resource companies or the oil and gas companies who are producing it.

CHAIR—Mr Jones, you have had a good input so far. If you make some specific remarks we will deal with your submission.

Mr Jones—I have already covered most of terms of reference 1 and 2 so I will skip those. I will just make an observation on 3. I do not mean any disrespect to the committee since they are your terms of reference. We do see that the list of things that you have put on the end there about grandfathering, carbon trading and carbon credits et cetera form a restrictive suite. Some of the things we think would be critical to the debate are not on that list. In terms of reference 4, from our point of view the critical question for deciding the impact of policies and measures on the supply of 53 per cent of Australia's energy—that is, oil and gas—and, therefore, the economic and environmental implications of this document, is not any of the things listed in 3. It is the question of where emissions are going to be acquitted and where you count them.

Let me run quickly down the oil chain. I said oil and not oil and gas. The whole of the upstream oil and gas industry produces about two per cent of Australia's emissions. The oil refining industry would put another two or three per cent in, making in total five. Burning petrol in our cars, use of diesel in our transport systems, and use of natural gas in our houses and factories would add another 20 or maybe 25 per cent of the nation's total. All told, running right down the petroleum stream, you are probably talking about somewhere between 20 and 25 per cent of Australia's emissions coming from petroleum.

That is not clear when you look at the National Greenhouse Gas Inventory. The whole idea of aggregating all stationary energy sources into one figure in that inventory gives you a very policy insensitive document. The sort of disaggregation which the Victorian government have done of their inventory, where they break up that huge chunk which is stationary energy into washing machines, hot-water systems, dishwashers, heaters, factories, et cetera, is a much more policy useful way of looking at the figure to assess the economic implications.

One suggestion that has been put by the AGO is that, if you want to have an efficient greenhouse policy system, the fewer points of counting the better. Their view would be that the whole of that 25 or 30 per cent of national emissions which result from the burning of petroleum in its various forms would be accounted for either by the oil and gas producers or by the refiners and the gas retailers. Doing that creates some huge economic and policy problems.

Let me illustrate just by working down the chain. Do not worry about what the measure is; just assume that greenhouse is a cost impost.

If it is applied at the exploration and production end, then because oil prices are set internationally, it will do absolutely nothing in terms of a price signal to the consumers in Australia. We will not be able to raise the price of crude oil to account for the cost of those 25 or 30 per cent of emissions. It will be straight off the bottom line of the exploration and development companies. It comes back to what I think Mr Byrne asked me about before: they will move overseas. Exploration and development will just move out of Australia. You will have put a huge cost impost in a place where the rest of our competitors do not have it; full stop.

Let us instead put all 25 or 30 per cent of it on the Australian refining industry. Again, as the public debate of the last few weeks has made clear, the price of petroleum in Australia is set in world markets. You will not be able to increase the price of petrol and give a price signal if you acquit it all at the refining level—unless you can put a tariff barrier on which would make sure that all imports of petrol and diesel were taxed at some sort of a rate to make them competitive with the greenhouse impost cost of petrol in Australia. Whether you can do that under the WTO is of course a moot point.

CHAIR—I heard it said that Woolworths and someone else have imported their own petrol from Singapore. Is it so that some retailers will import petroleum?

Mr Jones—Yes.

CHAIR—That sustains what you said.

Mr Jones—It is as simple as that. Woolworths can now go to an oil refinery in Singapore or in the Persian Gulf and buy petrol. If because of the greenhouse impost the price of Australian petrol is higher than the Saudi Arabian or the Singaporean petrol, why would you buy in Australia? The economics of greenhouse at this stage becomes fundamentally important for other things as well. Where does that leave the security of the energy supply in Australia? If you had the worst case scenario, over time you would get progressive closures of Australian refineries and Australia would be totally reliant for its petrol supplies on imported petrol. It is not just a matter of economics, greenhouse and the refining industry at that stage; there is a reliability and security question which comes into play.

If you then put it on at the wholesaler level, you have exactly the same problem. The only place you can put this cost impost on and dodge the WTO tariff barrier question and trade distortion is in fact at the consumer level. So the question is from both an economic and greenhouse point of view: unless it is at the retailer-consumer level, you get no greenhouse signal and you get a massive economic distortion.

CHAIR—We had better not let that get outside this room!

Mr Jones—It is very important that each of the fuel chains are looked at in that sense, because where you acquit the emissions becomes fundamentally important in terms of economics. The same thing would apply with gas into electricity into the household, into the factory, with coal into electricity into the household. Theoretically, you could come to a

conclusion where power stations which were close to the coast may decide it is more economic to import coal rather than to use Australian coal, which becomes an absolutely economically ludicrous decision. But if the cost impost put on the upstream coal industry is vicious enough, that would be the end result you would come to. So where you acquit becomes fundamentally important. Acquittal is not covered in terms of reference 3, but it is very important for making the decision about what the economic implications are in terms of reference 4.

CHAIR—We have never heard this before. The fact that we never heard it from the Greenhouse Office is a matter of some concern.

Mr Jones—If you look in their first discussion paper on emission permit trading there is a little discussion about acquittal and it is all in terms of if you acquit at the petrol station, and God only knows how many petrol stations there are in Australia, probably 5,000 to 10,000; if you acquit at the production end, there are 91 production facilities in Australia owned basically by 12 companies; if you do it at the refinery end, there are six refineries in Australia owned by four companies. Nice logic says to you it is much simpler to use six refineries and four companies rather than 5,000 retail stations, until you start thinking about what the other implications are.

I very carefully did not discuss auctioning versus grandfathering or partial grandfathering or anything else because the tool does not matter. All that matters is where the cost impost is going to hit and when. And you do not need to even consider the grandfathering versus auctioning versus partial question if you put your acquittal at the wrong end. I am being very careful here—I am not saying categorically the oil refineries would shut the next day and the oil and gas industry would turn the taps off and move; it would be a process of time. But there would be no reinvestment in upgrading of refineries and maintenance, there would be no additional exploration and, over time, the industries would move. So acquittal is a fundamentally important issue.

Senator TCHEN—Unless Australia fully buys into Kyoto's compliance and enforcement system so that we can impose a tariff on imported—

CHAIR—Yes, you would either have to protect the industries or not.

Mr Jones—The only way you can make the system work, as I said, is to have a tariff. And there it is not simply a matter of Kyoto compliance mechanisms; there is a matter as to whether you can design a Kyoto compliant tariff which is, in fact, consistent with the WTO rules.

Senator TCHEN—That is what I am getting at. I suspect that is what the UNFCCC is working on.

CHAIR—Yes. The issue of paramountcy—which convention is paramount to the other—is always fudged in these cases.

Senator COONEY—Perhaps we ought to point out that the other part of the committee is looking into the World Trade Organisation—we have the same committee doing two inquiries.

CHAIR—Let us pause there. That is very meaty stuff. Let us go through some more—

Senator TCHEN—I am sorry to have interrupted. I did not hear the full submission and it was just that this particular point linked up with what we heard earlier.

CHAIR—Mr Jones, do you want to add some more?

Mr Jones—That is the other key point of part 4 of our submission and that is really what it is all about: where you acquit. I can only talk with absolute authority about the oil and gas chains, but you could do a similar exercise for every other fuel and make decisions about what happens when. But if you are going to go down the market based mechanism, the emission permit trading, any of these mechanisms rules, the only way it eventually works is if you put on a cost impost which becomes a price signal to the consumer and the consumer responds. Whether it is done by regulation, by trading, by legislation or anything else, the way you and I respond is when we get a price signal.

CHAIR—Right. Are there any more questions?

Mr BYRNE—I would not mind getting a response from the AGO with respect to that. As I have been consistently highlighting throughout the day, I find that these sorts of issues just do not seem to be being brought to our attention by the relevant government departments, which is the reason I asked you that question about who is actually listening to you. This is obviously material that we need to contemplate and raise with the appropriate government departments at the right time.

Mr WILKIE—I imagine you are not getting much in the way of R&D relief for the research?

Dr Cook—You would be aware of the debate that is going on about 125 per cent deductibility and so on. That is a different discussion. My personal view is that we need to take some positive steps to increase the level of R&D in Australia fairly quickly, but that is a personal view.

If I can just add to the question of R&D, so far we have, not unreasonably, been focusing on the perceived threats arising from Kyoto—the threats in terms of what it means to both world climate and so on and the economics of Australia. Maybe I am just a born optimist, but there is a slightly different view that says: if Kyoto does come in, what are the opportunities there for Australia?

One of the opportunities may just happen to be the sort of thing we have been talking about—geological disposal of carbon dioxide. It so happens that some of our oil wells are producing something like 87 per cent of the oil, which is almost unheard of, in the world as a whole. Thirty per cent is the normal sort of figure. It could be that our reservoirs are quite different from those in most other parts of the world. This being the case, it could well be that there is more opportunity for putting CO₂ into them. What does this mean, in terms of opportunity?

Being really cynical about this, look at what happened with the Montreal Protocol. For a long time, the United States was pretty much against that one until—lo and behold!—one or two US companies suddenly decided that they had some alternatives to CFCs. Not only that, but you could charge a little bit more for those. I do not have any basis for saying this, but suddenly

there was a change of attitude in the United States and suddenly it wanted to ratify the Montreal Protocol. In terms of some of the technologies that ultimately are going to be brought to bear in this area, If the United States does come up with some partial technical fix in this area, I would not be at all surprised if you suddenly find there will be a different attitude to ratifying Kyoto. It is the sort of thing that we also have to consider in Australia. I do believe that it is to our advantage to also look to the upside of this and to look at where the opportunities might lie for Australian industry, rather than just focusing on all the negatives in this area.

CHAIR—It is up to people to put it to us and to put it to us in a form of some veracity. We had former Senator Rae who turned up telling us that wind power and solar power were going to replace all the jobs that were to be destroyed in the industries that would suffer on full ratification. As authority for that, he quoted the EU Commissioner for the Environment. When we asked him what the EU's attitude was towards Australia's national interests in matters of agriculture and wasn't there some strange contradiction between the two, he fell silent.

If you are going to advocate that line—and it is a respectable line of argument—you have to put something pretty weighty behind it. The way the show works is that we represent people whose incomes and family life depend on the structure of the economy as it is now. The burden of proof is on those who would destroy the structure. That is the basis on which we examine all the treaties in the national interest. If you want to do it, we will welcome submissions that would put some light at the end of the tunnel. But it is a serious matter to advocate that. What you have done today has great weight behind it—the geological disposition and disposal of CO₂. That is the kind of evidence that we find very convincing.

Mr Jones—Could I add to what Dr Cook said. Between the two of you, you have made a fundamental point that has not been drawn out. Kyoto is not just an environmental protocol. It is at the end of the day a trade war. This is probably the best example: he who wins the fuel cell race for motor vehicles—be it the Japanese, the United States of America or the Germans—will gain a huge trade advantage. Whoever wins will get a fundamental trade win in the next round of motor vehicles. That is not an insignificant issue in the game. He who cracks the low cost silicon cell for solar heaters and solar change will get a fundamental trade advantage. It is the same thing. The big dollars and cents on these things are not being spent in Australia; they are being spent in Japan, in the USA and in Europe. What we have is a future trade war going on between the three big economic powers as to who is going to control the next generation of energy technology. At the end of the day, that is one way of looking at Kyoto—it is just a tool to facilitate that trade war. Whoever wins the debate in The Hague, or in the ones after, about what the mechanism means will be trying to skew those mechanisms to aid them in the technology trade war of the next generation of energy equipment.

Senator COONEY—I can follow that, but I want to get back to what Dr Cook was saying. Do we just stand there and—

Mr Jones—No.

Senator COONEY—Do we see ourselves as victims of this clash or do we try to do some research ourselves?

Mr Jones—Dr Cook is right, and that is why his research is so important. It is one area where we can potentially carve a niche for ourselves. I think some of the other people who either have given evidence to you or will give evidence to you will talk about ceramics, photovoltaics, fuel cells and Australia having a potential R&D advantage in those things. There are places in the R&D spread where Australia has a real chance of carving a niche market in this and of winning part of that trade war for ourselves, but the right policy settings have to be set there. At present, R&D policy for greenhouse technology change does not rate on the policy spectrum. There has not been a major policy statement from any political party. I may be doing one or two of you a disservice by making that sweeping statement—I apologise if I am—but I have not seen a statement where someone has stood up and said, ‘There are real R&D issues to be addressed in relation to technology and greenhouse gas. We think the priorities are there, and we ought to be doing something about it.’ This is where we have a very clear advantage because of Dr Cook’s work.

Senator COONEY—Am I wrong in concluding that what you are saying is that, if any of those major players—the United States, Japan or the European Union—got to the non-carbon fuel discovery, Kyoto would press very hard against us? Can you see that, even if they did discover these things, we would still be able to use our fossil fuel without too much pressure from the rest of the world?

Mr Jones—I think what is more likely to happen is that we will find ourselves buying technology. To use the most obvious example, the most likely breakthrough in R&D is using a fuel cell to turn natural gas into hydrogen. The chances of that breakthrough coming from an Australian researcher with an Australian patent are probably quite low, but if that happens then the nature of the motor car and a lot of heat pumps in industry will change fundamentally. Whichever country or whichever company wins that race will make a lot of money in the future. We will still be able to use our natural gas as a fuel, but we will be buying the fuel cells from somewhere else.

Dr Cook—At the present time, the easiest way of getting hydrogen out of natural gas is through a thing called a shift reaction, and that produces hydrogen—you are taking methane, ethane and so on. You are producing hydrogen and you are producing CO₂. You are still producing lots and lots of CO₂ through this reaction. If we had places where we could get rid of the CO₂, even if we had not generated the hydrogen cell technology, we would still have a potential advantage here in Australia. So those are the sorts of things that we have to look at. But people think in terms of hydrogen cells—that is the answer. It is not. There is a downside to it: what do you do with the CO₂? Every time you have a fossil fuel, you produce CO₂. There is no way around it, generally speaking, unless you go to solar and all those sorts of things. They all have to be part of the solution. Our solution ultimately is going to be a mosaic of responses. Hydrogen cells will be one, geological disposal will be part of that and so it goes on. There is not going to be one solution to this.

CHAIR—To sum up a little bit of what you say—I do not want to put words in your mouth—you seem to be indicating that the AGO’s approach to the policy does not emphasise research and development and new technology quite as much as you think it should. Is that fair to say?

Mr Jones—Yes, that would be one aspect.

CHAIR—We have got that feeling today too. If there is a chance of another stab at it after the COP6, if there are some real changes to these definitions and things, by all means send another short submission by letter and we will have another hearing.

Resolved (on motion by **Mrs Kelly**, seconded by **Mr Wilkie**):

That this committee authorises publication of the evidence given before it at public hearing this day.

Committee adjourned at 4.56 p.m.