



# **HOUSE OF REPRESENTATIVES**

**STANDING COMMITTEE ON ENVIRONMENT, RECREATION AND THE ARTS**

**Reference: Trading in greenhouse gas emissions**

**SYDNEY**

**Monday, 4 May 1998**

**OFFICIAL HANSARD REPORT**

**CANBERRA**

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

Members

Mr Causley (Chair)

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

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

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

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

the allocation of the right to emit greenhouse gases;

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

possible emission traders, administration and transaction costs;

roles and responsibilities of governments and other stakeholders; and

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

**WITNESSES**

<b>COLLINS, Mr Drew, Director, Economics and Environmental Reporting Branch, New South Wales Environment Protection Authority, Level 5, BOC Gases Building, Citadel Towers, 799 Pacific Highway, Chatswood, New South Wales 2057</b> .....	<b>3</b>
<b>CUSACK, Mr Lester David, Chairman, CIF Greenhouse Gas Working Group, Cement Industry Federation, c/- Australian Cement Holdings, Railton, Tasmania 7305</b> .....	<b>58</b>
<b>FLANAGAN, Mr Paul James, Environmental Manager, Pacific Power, Park and Elizabeth Streets, Sydney, New South Wales 2000</b> .....	<b>39</b>
<b>HOSKING, Mr Leslie Victor, Chief Executive and Director, Sydney Futures Exchange Limited, PO Box N680, Grosvenor Place, New South Wales 2000</b> .....	<b>72</b>
<b>LANG, Dr Robert David, General Manager, Operations and Marketing, Pacific Power, Cnr Park and Elizabeth Streets, Sydney, New South Wales 2000</b> .....	<b>39</b>
<b>OATES, Mr Lindsay Edwin, National Business Development Manager, Pacific Power, GPO Box 5257, Sydney, New South Wales 2001</b> .....	<b>39</b>
<b>ORCHISON, Mr Keith, Managing Director, Electricity Supply Association of Australia, PO Box A2492, Sydney South, New South Wales 1235</b> .....	<b>21</b>
<b>SCHAAP, Dr Harry, Assistant Director, Environmental Affairs, Electricity Supply Association of Australia, GPO Box 1823Q, Melbourne, Victoria 3001</b> .....	<b>21</b>
<b>STARR, Mr Malcolm Douglas, Policy Director, Government and Legislative Affairs, Sydney Futures Exchange Limited, PO Box N680, Grosvenor Place, New South Wales 2000</b> .....	<b>72</b>
<b>STEVENS, Mr Peter Gerald, Principal Policy Officer, Natural Resources Branch, New South Wales Cabinet Office, Level 38, Governor Macquarie Tower, 1 Farrer Place, Sydney New South Wales 2000</b> .....	<b>3</b>

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*Trading in greenhouse gas emissions*

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Monday, 4 May 1998

Present

Mr Causley (Chair)

Mr Billson

Mr McDougall

Mr Eoin Cameron

Mr Mossfield

Mr Jenkins

Committee met at 9.00 a.m.

Mr Causley took the chair.

**CHAIR**—This inquiry is into the regulatory arrangements for trading in greenhouse gas emissions and was referred to this committee at the end of October last year by the Minister for the Environment, Senator Hill. Submissions were called for and 60 have been received to date. The committee is now starting on a program of public hearings and today's hearing is the first.

The concept of international trading in greenhouse gas emissions has moved to centre stage since it became a last-minute inclusion in the Kyoto Protocol. How it will be implemented remains to be decided. That process will start at a meeting of the parties to the protocol in Buenos Aires in November this year. In the meantime, a number of international pilot projects are coming into existence. Companies and governments are seeking to develop experience with what is likely to be a very complex trading environment. They want to position themselves to exploit the market when fully fledged international trade is established. Setting up a domestic trading scheme that can be integrated easily with the international scheme could be to Australia's economic advantage. It would also contribute to reducing Australia's emissions in line with its commitment to the Kyoto Protocol.

This inquiry is focusing on the arrangements that should be put in place for a domestic trading scheme. At the same time, the committee will be bearing in mind that Australia's trading scheme should be capable of being integrated with the developing international trade. As the committee collects information about the best sort of scheme to adopt, it will be looking for mechanisms that will ensure that emission trading contributes to emission reduction as equitably, effectively and efficiently as possible. It will be looking for ways of providing maximum certainty at minimum cost for the environment and the emission traders.

[9.03 a.m.]

**COLLINS, Mr Drew, Director, Economics and Environmental Reporting Branch, New South Wales Environment Protection Authority, Level 5, BOC Gases Building, Citadel Towers, 799 Pacific Highway, Chatswood, New South Wales 2057**

**STEVENS, Mr Peter Gerald, Principal Policy Officer, Natural Resources Branch, New South Wales Cabinet Office, Level 38, Governor Macquarie Tower, 1 Farrer Place, Sydney New South Wales 2000**

**CHAIR**—Welcome. Today's committee proceedings are recognised as proceedings of the parliament and warrant the same respect that proceedings in the House of Representatives demand. Witnesses are protected by parliamentary privilege in respect of the evidence they give before the committee. You will not be asked to take an oath or to make an affirmation; however, you are reminded that false evidence given to a parliamentary committee may be regarded as a contempt of the parliament. The committee prefers that all evidence be given in public but, should you at any stage wish to give evidence in private, you may ask to do so and the committee will give consideration to your request. We have received a submission from you and have authorised its publication. Do you wish to propose any changes to that submission at this stage ?

**Mr Stevens**—No.

**Mr Collins**—As part of that submission there is a draft report which is now printed and available readily, and we can provide additional copies if that would help.

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

**Mr Stevens**—Yes, just very briefly. The New South Wales government has been doing a great deal on greenhouse issues over the past several years. I brought with me copies of the Premier's statement of last June, which gives an update on all the things that have been going on in the way of mitigating greenhouse gas emissions, and a more recent set of initiatives from the Sustainable Energy Development Authority which gives some update on that. They are both available to provide some background information to the committee. In more recent times the Premier has written to the Prime Minister advocating that a number of the initiatives that are discussed in there be taken up nationally, particularly in the energy area.

As part of the work that New South Wales has been doing in its own efforts to reduce greenhouse gas emissions, there have been some attempts to look at what you might call reduced versions of emissions trading within New South Wales. There are two examples of those that are of interest to the committee. One is the report on emissions and the tradeable credit scheme—that is the one that Drew Collins has referred to. There are copies there for each of the committee members. I will leave it to Drew to respond to questions on that and we will go into probably the bulk of the work that was the accompaniment to the submission.

There has also been a fair amount of work going on, not yet publicly, at least not in the main publicly, on emissions contracting. Both of these reports and studies have been involved in looking at what can be done within the electricity sector within New South Wales. These are double restrictions that really

limit what can be done. There are considerable problems in tackling that within state boundaries. Essentially, the government position at this stage is a very restricted one. We are still looking at the issues and trying to work out where we want to go. But it is quite clear that there is a strong view that emissions trading would be a good and positive thing in a number of areas for greenhouse gas reductions.

There is a very strong preference for a national trading scheme rather than one in the state, although that has not been abandoned. It is just a question of whether or not the timing is right. We would certainly like to see a wider scope than those we have looked at, because of the limitations that they introduce. We would be keen to see it sooner rather than later. I have got here a very brief statement of the emissions contracting scheme because I think that is less known to the committee. There is a very brief public document there which sets out the broad parameters of what that scheme is about. That is all I need to say.

**CHAIR**—Thank you, Mr Stevens. Mr Collins, would you like to make a statement?

**Mr Collins**—Yes. New South Wales, and particularly the New South Wales EPA, have recognised that economic instruments—and that includes emissions trading schemes—can be effective in reducing the costs associated with meeting environmental targets. On that basis, we are interested to have a look at the scope for an emissions trading scheme as it might apply to the electricity retail sector in New South Wales. As I said, that has come from some experience we have had with emissions trading in New South Wales as well as canvassing international experience, and that led to the report that we have mentioned.

That report canvasses, I guess, some of the key preconditions for an emissions trading scheme: whether there are constraining and enforceable targets, whether there is variability in emission abatement opportunities being faced and whether administrative and transaction costs would be relatively modest compared with the benefits being gained. The report canvasses those preconditions, it canvasses a range of other issues associated with emissions trading and it raises a number of questions as well, many of which have been left unresolved.

I will just briefly comment on the possible significance of that report to your inquiry. I believe that there are overlapping technical issues and data contained in that report which would be of interest to your committee. I believe the report provides qualitative support for the use of emissions trading to assist in minimising the cost of achieving greenhouse gas targets. In particular, it does demonstrate variance in the cost of emission abatement opportunities faced by electricity retailers. This variation is likely to increase as you broaden opportunities to include generators, other sectors or, indeed, other states in emissions trading. This variation in opportunities is a fundamental prerequisite to a successful emissions trading scheme.

I believe the report also provides support for the Industry Commission's conclusions in its recent paper on a framework for emissions trading which indicated that the greatest gains are likely to be possible if we see a response at the national level, rather than each jurisdiction, each state, pursuing measures at their own level. I think this is particularly important because most of the strategies that we identified in our report do focus at the generator level. Generators in New South Wales do operate in the national electricity market. Therefore, there would be a number of issues impacting upon greenhouse reduction measures affecting New South Wales generators and not generators in other states. Those measures go through a range of legal, administrative, efficiency and equity issues. I will just leave it with those brief opening comments.

**CHAIR**—Thank you, Mr Collins. I might just lead off with a couple of questions and then I will let the members of the panel ask some from there. You mentioned in your submission, and you have mentioned it again in your preamble, that in fact you believe that any trading scheme would probably be better off as national and possibly international. I think in the submission you said that that would drive efficiencies in greenhouse emissions even lower. What are your ideas on that? How do you believe that the international scheme would be more competitive and drive the standards lower?

**Mr Collins**—It is possible to set an emissions trading scheme at a number of levels. Certainly in New South Wales we have one at a very micro level, a bubble licence for emissions trading for the Hawkesbury and Nepean rivers. It applies only to three sewerage treatment plants. I believe it is a very successful scheme. It is possible to set an emissions trading scheme in a range of levels. That could be undertaken for greenhouse gas emissions also, but the conceptual issue is that as you broaden the range of a scheme, as you grow that potential bubble, you include more opportunities for emission reductions. Therefore, you include more lower cost opportunities and the gains, conceptually, would be much greater.

So from a conceptual argument it would seem to be more beneficial to have a broader, rather than a narrower, scheme. That has to be balanced with the administrative costs and feasibility of any such scheme. Sometimes a more modest scheme can be easier to implement and operate. The point made in that report is that there would be significant development costs on the technical side of the scheme as well as legislative implementation to commence a scheme in New South Wales. Perhaps it would be prudent to wait and see what is happening at the national level before that happens because there are issues of possible additional cost that may otherwise not be necessary.

**CHAIR**—There have been some suggestions on the international scene that countries like America, for argument's sake, might be prepared to put technology into developing countries that would improve their greenhouse emissions or they might be prepared to plant plantations in other countries for trade-offs on emissions in their own country. Do you see this as being feasible or do you think that that is probably not practical, that the developing country would see that just as a way of keeping them as a developing country and not being able to achieve their potential?

**Mr Collins**—There is a range of issues across the whole spectrum, from technical to equity and political, that would impact upon the answer to your question. In principle, it is trying to achieve a broadening of the opportunities to bring in other players and hence to try to bring in those lower cost opportunities. An offset scheme, which I see that as, in principle does offer a benefit, but I am not in a position to comment now on whether or not that would be technically feasible.

**CHAIR**—Australia is depending quite a lot on sinks and the sink we are looking at is the planting of forestry. Do you know whether any of your departments, particularly the Department of Forestry, have done any work on assessing what in fact is the amount of carbon dioxide a growing tree might absorb?

**Mr Stevens**—There is a certain amount of information. I do not have the detail on that, but certainly State Forests has been looking extensively at the potential opportunities that may arise for it in the case of the emissions trading scheme coming into being. Whether they have got that exact figure I do not know. I would have to take that on notice.



**CHAIR**—That would include areas of land that might be available and the overall effects on the economy?

**Mr Stevens**—I think that would be at the preliminary stage, but certainly those questions have been raised.

**CHAIR**—Do you think there should be some support in that from the CSIRO or someone like that for some of those studies?

**Mr Stevens**—Since it is something that is needed nationally, it makes good sense for it to be undertaken at a national level. The regional variations still need to be looked at by the individual jurisdictions.

**CHAIR**—So you would see that at the very least a national scheme would be important. Would you think that would be developed through the COAG process? Where would you see the state governments being involved in this process? Do you think it should be through the COAG process?

**Mr Stevens**—I think there will be a considerable need for Commonwealth-state cooperation to achieve it and COAG is probably the umbrella through which that will be achieved. To be delegated to a group from COAG seems to be more appropriate.

**Mr MOSSFIELD**—In its submissions to the inquiry, the MTIA referred to difficulties that have arisen in calculating compliance in relation to the national pollution inventory and the New South Wales load based licensing system. Has the New South Wales government had experience with checking on industry compliance with limits on emissions?

**Mr Collins**—The New South Wales government currently licenses discharges to air and water of a number of pollutants. We are currently in the process of overhauling our licensing system to move to the load based licensing system that you mentioned. An important aspect of that is measuring the actual discharge loads of those particular pollutants.

I have two comments on that. Firstly, under current licences and licence conditions, there is a need to audit and ensure that licence conditions are being met. Therefore, there is no shift in that requirement to audit and ensure compliance with licence conditions. It is moving more towards a load or a total mass based licence rather than just relying on concentration limits. Secondly, with regard to developing estimation methods to assess loads, we are in the process of negotiating those methods with industry and other interested parties. We have had one generation of load estimation methods or protocols and we have had them out for consultation. We have adjusted those in view of the feedback we have received. We are in a position to shortly send out the second generation of estimation methods. It is an important technical exercise that needs to be undertaken to ensure there are low cost but effective estimation methods but we believe that, in the context of load base licensing, that is achievable.

**Mr BILLSON**—The focus of your work is almost exclusively on electricity. Is that a choice of where you feel most value can be gained in the short term or is that a starting position because of the fewer number

of players that are involved? Could you talk me through why there is a very strong electricity focus and how you are looking to your work to transport ideas into other sectors?

**Mr Stevens**—The reason we are staying with the electricity sector flows from the Electricity Supply Act's introduction of licensing requirements and the formation of a benchmark reduction target to be achieved by electricity retailers. It was there, in an effort to find the most cost-effective ways of achieving that, that the beginnings of looking at emissions trading started. That is why the focus has been on that sector in both of those things that we have looked at.

Once you start on the electricity sector you are aware that there are a fair number of advantages in the electricity sector. The players are relatively few, the data are well known and understood, and the national market is already taking information so that the information will be readily available for those purposes. That has been the reason for that historical concentration. I think generally we would find it agreed that that is probably the easiest area in which to attempt this. There are difficulties the more you expand to other sectors but, in the long term, those difficulties will need to be tackled. The electricity sector may well be a very good place to start nationally.

**Mr BILLSON**—Under the Electricity Supply Act, as I understand it and as I think you have just suggested, the retailers are the ones with the targets.

**Mr Stevens**—That is right.

**Mr BILLSON**—Are you hoping the retailers will put the pressure on the generators to achieve those targets? Or are you talking about an energy mix, where they will offer gas products in lieu of electricity? How does that concept come together?

**Mr Stevens**—There are some considerable problems for the retailers since, under the national market, most of our electricity comes from the national pool and is undifferentiated in relation to its greenhouse gas intensity. Some of the stuff that is under discussion has been attempting to look at ways of moving around that to gain that information and then credit retailers with specific lower emission intensities, despite the masking introduced by the pool. This is very technically difficult and raises a lot of problems in any scheme. Again, hopefully it would be one of the reasons why, at a national level, we would be able to unwind that. As part of the Prime Minister's statement of last November, there have been moves nationally to look at ways of identifying the intensity of energy in the pool and using that information.

**Mr BILLSON**—I am interested in what you are doing and how it can be applied more broadly. My curiosity is triggered by the retailers having the targets and yet the generators, in some other discussion, being the ones who are after the permits. If you apply that concept more widely and you talk about the motor vehicle industry, who carries the targets? Who has the obligation to improve their performance? If it is the car manufacturers, there is not a whole lot of signal to the petroleum industry to look at what it is doing or a whole lot of signal to the drivers to look at what they are doing. Have you come across those difficulties in trying to change behaviour all the way through? You have landed the responsibility on the retailers, under your law.

**CHAIR**—The retailers will be buying from the generators so obviously price comes into this, does it?

**Mr Stevens**—Yes. The retailers are the subject of this because they are subject to environmental regulation in a way that generators are not. It is also possible, since we can license all the retailers who retail into New South Wales whatever their base origin, that we can address all of it, whereas we cannot regulate generators across the borders. There are reasons for that. We are not convinced, you will find in the report that you have seen, that in a broader scheme the retail level would be the best to target. There are considerable arguments in favour of moving to a generator level. We are aware of that tension and the resolution is partly involved in the tension between the state and a national scheme.

**Mr BILLSON**—With regard to the notion of start up credits, in the peak electricity industry's submission they said, 'Trading is fine as long as you give us all the credits we need to keep doing what we are doing now for foreseeable growth into the future.' That did not strike me as quite the spirit of what we are after. Have you come across that—whether you give them 85 per cent start ups within an accounting period, starting in 2002, or something like that to put some pressure on them to do some things in the short term?

**Mr Collins**—The allocation of credits in any emissions trading scheme is a critical issue. It has big ramifications in terms of the economic efficiency of the scheme and also the financial impacts on the different players. From a conceptual economic point of view, the market will reallocate the credits and lead us to an efficient outcome. However, there could be very large adjustment costs in the meantime and, therefore, any initial allocation has to be mindful of that. With regard to the emission trading schemes the EPA has been involved with, in particular the Hunter River salinity trading scheme, there was a multi-criteria formula used to determine how credits would be allocated, which took into account past environmental performance, levels of production and the like. I believe similar issues would be important to consider in a broader greenhouse emission trading scheme.

**Mr BILLSON**—In terms of the gases that you are seeking to trade in, is that the full spread or are you running primarily with CO<sub>2</sub>? Is abatement across the full spread or are you just limiting it to one of the six gases that are covered by the Kyoto Protocol?

**Mr Stevens**—I do not think there is a government position on that at this stage. Clearly, in the electricity industry, the bulk of the question arises with CO<sub>2</sub>, so we have an additional simplification, which has helped. If we were to do a national scheme we would want to take into account all six gases that have been nominated so far.

**Mr McDOUGALL**—You have talked mainly there about what you propose to do on a national scheme. How do you take that into an international protocol, particularly in relation to trading? We know that, at the moment, there is some doubt as to whether the US are going to sign up anyway. Who sets the benchmarks at the international level? If they are not in line with our national benchmarks, where do we go from there?

**Mr Stevens**—Again, we have no firm position on this. We think that the development of a national scheme within Australia would need to be aware of developments internationally in relation to a trading

scheme. That is a very strong reason why Australia needs to get in and do some work on emissions trading in order to be in a position to know what is possible and what it needs in an international arena. But we have no view, at this stage, on what the international position will need to be.

**Mr McDOUGALL**—Is it a matter of us setting our benchmarks and maybe being one of the leaders in setting the international benchmarks? Are we in a position to be able to do something like that?

**Mr Collins**—If, in the Australian context, we are looking to effect a particular emission reduction target, then emissions trading may be a way to do that. An emissions trading scheme sets up a currency for emissions. If there is a global scheme set up, then there will be a global currency. We have to ensure that the two currencies match—that we do not undervalue our future emissions trading currency relative to the global currency. In short, what I am saying is: we could look to develop an Australian scheme but, in trying to dovetail that within any international scheme, there would be a range of issues which would need to be examined to ensure that the Australian position is equitable and fair in relation to the international scheme.

**Mr McDOUGALL**—Some people will say that emissions trading might add to an industry's costs and therefore decrease its competitiveness. What comment do you have in relation to that?

**Mr Collins**—With a caveat of, depending upon the boundaries of the scheme, who is included and who is not included, emissions trading schemes are fundamentally about providing a low cost means to achieve an environmental target. If we believe that an environmental target needs to be achieved one way or another, emissions trading does not add to the cost of it; rather it provides opportunities for a lower cost means of meeting that target.

**Mr McDOUGALL**—In your discussions with industry, other than the electricity industry—let us take the private sector industry—what thoughts have they relayed to you in regard to it?

**Mr Collins**—I will respond in the context of the two pilot emission trading schemes running in New South Wales. With respect to the Hawkesbury/Nepean bubble licence, which is operated by the Sydney Water Corporation, our estimates are that it is leading to the realisation of the environmental target. It is something in the order of 20 per cent below the cost that otherwise would have been incurred with uniform targets.

In the context of the Hunter River salinity trading scheme, the EPA was almost in a position of not being able to issue further licences because of encroachment on environmental conditions in that river. Since we have had the emissions trading scheme going, that has not been the case. We have been able to maintain the environmental standard as well as allow new industries to enter into the scheme and develop opportunities in the Hunter River. If anything, I believe current practice demonstrates that emissions trading does provide a practical, fair and, in particular, low cost way to achieve environmental targets.

**Mr McDOUGALL**—What is the impact of population growth?

**Mr Collins**—In what context?

**Mr McDOUGALL**—We have a reasonable population growth compared with some other developed

countries. We obviously already have a very high rate of emissions. What is the population growth going to do in regard to eroding into any emission controls that we actually put into place as compared with perhaps having a credit trading with another developed country?

**Mr Collins**—Population growth will obviously impact on the level of emissions in a business-as-usual situation, and was, therefore, a key issue raised by the Commonwealth government in its negotiations under the Kyoto Protocol. But, again, I would reiterate that that impacts upon the environmental target and, if you like, the severity of measures to meet that environmental target, whereas emissions trading does not add to that; rather, it works to minimise the costs in meeting that target, be it with an increasing population or not.

**Mr McDOUGALL**—You may have answered this question, but what is the best way and which way is going to end up giving us the best end result—sinks or trading?

**Mr Stevens**—I do not think you would want to be faced with an either/or on that. Sinks have limited ability to do absorption long term. Once you have grown a crop on a piece of land, you can recycle—you can go through the same cycle again—but you are not going to increase beyond that level. That is the total. Sinks of that kind are only a short-term measure to soak up emissions. If we want to reduce on a longer term, we either need some very nice new technology for absorbing carbon dioxide, or we need to find other ways of reducing emissions. So, long term, trading is definitely the preferable thing. Sinks are just a buffer.

**Mr Collins**—Sinks and emissions trading are not an either/or. You can certainly incorporate emission sinks in emission trading schemes.

**Mr McDOUGALL**—When we talk about sinks, we seem to always talk about forestry. What about cropping as opposed to forestry? The argument was put to me recently that the sinkability of the wheat crop in Western Australia is about equivalent to the output from the electricity generation on a tonnage basis of CO<sub>2</sub>. That is a repetitive cropping system rather than trying to just do reforestation. Do you know of any work that has been done in relation to that?

**Mr Stevens**—No, but I think the studies that you might look to are the ones done for bagasse in Queensland to see what they had been doing there. Essentially, with short-term crops like that, the return of the carbon to the atmosphere is very short term. It will rapidly be back in business. You can grow crops for fuel production and substitute for a fossil fuel and in that way make reductions, but as to the sink effect of storing the carbon in the plant, it is back in the atmosphere in a fairly short number of years and it is not great value. The advantage of forestry is that not only is it a long time growing but also it stays there. You can lock it up for quite long terms.

**CHAIR**—But there has to be a limit to that too because you have to have land for agriculture as well.

**Mr Stevens**—That is right.

**Mr BILLSON**—On the issue of the start-up credits and what you are considering doing, are there any benchmarks being run over current players? There is a concern in some quarters that allocating start-up credits based on current levels of emission in effect rewards non-performing entities that have done not much

of anything in the last few years to upgrade technologies and the like. I would be interested in whether you are planning to actually run some benchmarks over your retailers before they get into it. Secondly, is there a view that the government should retain some emissions capacity as a carrot to new industries to enter New South Wales as distinct from going somewhere else—simply by the offer of saying, ‘We can accommodate your emissions to this level if you come to the sunny state of New South Wales’? Any thoughts on that?

**Mr Stevens**—As Drew indicated before, the initial allocation is a key question and one of the things that is being wrestled with in relation to the proposed emissions contracting measures. In large measure, that has been dealt with. The poor performer—rewarding bad performance to date—is being looked at in terms of setting an earlier date—the date when everyone became aware of the problem—and saying that that is the date from which all improvements can be counted. But no resolution has been reached on those issues, and it is clearly one of the great difficulties. In terms of keeping some part of the allocation available for new industry, I think that is going to be essential in Australia with the growing population and growing economic activity. As to exactly how that is going to happen, we have not yet got an answer.

**Mr BILLSON**—Who are you going to squeeze that out of?

**Mr Stevens**—There are options in the initial allocations, in that you could simply auction them all, or auction all but 10 per cent and keep a rolling amount and buy people out. You could do a combination of grandfathering a fair proportion of it so that current players are not totally faced with massive costs and keep a small amount for auction and still retain some. You could have a floating fund to buy some back over time. You could make sure you have sinks growing to generate new credits as you go through. But all those require some pretty careful quantitative stuff as well as some matters of equitable principle.

**Mr BILLSON**—With respect to the issue about the duration of the permits, is that something that you have given some consideration to? A permit in perpetuity is money in the bank. Is there a point in time when you will perhaps auction the permits, terrify the current producers and wish them luck with the bidding war, or are you planning just to allow the permits to run on indefinitely?

**Mr Collins**—I might just reiterate that the EPA report, which is part of the New South Wales submission, is neither New South Wales government policy nor EPA policy, so there is no position to implement such a scheme. The only guidance on greenhouse emissions is that provided in the Electricity Supply Act and the requirement for retailers to reduce their emissions as provided for by the Minister for Energy, so that sets a uniform reduction target. That is the only policy position. This is really just canvassing possible approaches.

**CHAIR**—If I can make a statement on that, I think this whole inquiry is purely hypothetical: we are not looking at what government policies are or anything. We have a problem as to how we can make recommendations to the minister on emissions trading and so on. Most of this is hypothetical as to how we come to grips with some of these things—what would be the best way of tackling it?—and I do not think we should pin it on any government about policy.

**Mr BILLSON**—We do not have an answer either. We were told that the US Clean Air Act was a ripper as a starting point, but you work into the mechanics of it and you find it seems to terrify everybody—

so we are getting there.

The other point I would like to reinforce, as I understand it from your statements, is rewarding early action. What you are talking about would seek to accommodate action taken early in the piece, long before the accounting period, to the advantage of the retailer/generator. Obviously, you would be looking for that in whatever national scheme comes through.

**Mr Stevens**—That would be desirable but at this stage there is no formal position on that.

**Mr BILLSON**—We do not know how we would do that.

**Mr Stevens**—No, we do not but obviously you do not want perverse incentives in the scheme. If the perverse incentive is, ‘Don’t do it until the last minute,’ that will not work out well for the national strategy of reducing greenhouse gas emissions. Early reductions, I understand, are far more effective overall than late reductions.

**CHAIR**—If we assume, just for the purpose of this exercise, that in fact the trading licences were going to be issued nationally by the national governments or that they had put the responsibility back on us and not on them and we just auctioned off permits, surely that would give a great advantage to the more powerful players in the field? It is not just the electricity industry and the concrete making industry that are contributing to gases; it is right across the field and some of them are very hard to quantify. If you just auctioned off those licences, surely the more powerful people in the field would be more capable of buying a very valuable asset. Would that be true?

**Mr Collins**—That is true. The extent to which that financial burden is placed on industry needs to be carefully considered, as does the issue of concentration of market power. For most of the emission trading schemes you will see that in New South Wales or elsewhere there is usually some rolling over of emission credits back to auction to ensure that new players get some potential to access credits without necessarily negotiating directly with the incumbents.

In addition, in some trading schemes governments have held back a proportion as a safety working margin, which in the short term they can allocate to new players. Obviously, over time that reserve is exhausted but it does actually give some time to bed down the scheme.

**Mr BILLSON**—Or they trend down over time and pop up the other end.

**Mr Collins**—You have a sinking cap over time—that is right.

**Mr BILLSON**—What would you envisage though in a constrained marketplace—say, the energy sector—where you say you will start? One of the phenomena in the US Clean Air Act is that people from outside the generating and electricity industry pool together and purchase credits to take them out of the system as a way of investing in their kids’ futures. They can drop them back out later on. How constrained would you see the market for the credits? Would you let everyone have a run at them or would you start up with just the sectors that were being affected by the regulation in the first place and then ease your way into

something a little more open?

**Mr Collins**—There is a number of issues there. To the extent that you could capture all energy providers, in principle the costs of those credits will ultimately go down to the consumer. To the extent that you do not include all providers of energy you get what they call carbon leakage—so you are not actually ensuring you are going to reach your environmental goal—and you will also be penalising those energy producers in the schemes, so there are real boundary issues that need to be considered.

In terms of letting third parties trade in credits, I think the Sydney Futures Exchange person who is on later this afternoon might give you a comment on the ability of such trading to provide a risk management option for players but, again, there could be potential issues with third parties—

**Mr BILLSON**—Warehousing.

**Mr Collins**—Yes, in effect. That is right. I am not in a position to comment on that but I appreciate your question.

**Mr McDOUGALL**—I wish to go back to the question that the chairman asked right at the start when he talked about the Commonwealth's role as opposed to the states' role. I am involved in another inquiry about railways and what the Commonwealth's role is. What is the Commonwealth's role in this question? Do we leave it to the states? I know that you talked about the COAG process. But is it a states issue? What have you done with other states to date, particularly on the electricity industry and the cross-border issues? What is the Commonwealth's role, as opposed to the states' role, in this total question?

**Mr Stevens**—I do not like walking into Commonwealth-state relations questions.

**Mr McDOUGALL**—Perhaps I can preface it by saying that, taking on board what the chairman said a while ago, we are looking for answers. We really are in a position where we are asking that open question in an honest way—I am, anyway.

**Mr Stevens**—Yes. I will try and give you an honest answer. So far as discussions with other states in relation to these kinds of schemes, there have been some very informal discussions between officers in relation to the kinds of considerations that are involved but there has been no government-to-government correspondence/communication about it because New South Wales has suggested that it should be at a national level. These kinds of questions do not work well on a state-by-state basis and, if we are going to spread beyond the electricity sector, the state-by-state basis of the electricity market, which has largely been run by the states, will not be broad enough although it might be a good starting point.

On the more philosophical side of this, the Commonwealth has signed a treaty on behalf of Australia setting a target for Australia. So the Commonwealth is having a major role to play in assuring that is achieved. If it is going to ensure that it is achieved, it will no doubt want to see it achieved most cost effectively and that involves the contribution, we believe, of an emissions trading scheme to reduce the cost of whatever target we have set ourselves to achieve.



**Mr McDOUGALL**—One of the reasons I asked that question is that, in answer to Mr Billson a while ago, you talked about locking up trading within industry groups, or possible cross-trading. In my understanding, there is a major difference on emissions between the states in relation to what industries are based in them. If, say, you lock up the trading in emissions per industry group, you may discriminate against a state that cannot get enough effective trading within that industry group to get a balance and meet the targets that you have set down. How do you actually start restricting it to industry trading rather than cross-industry trading? Do you understand what I mean?

**Mr Collins**—No. I do not fully follow the point of your question as to why you would wish to restrain it to within industry trading rather than between industry trading. Clearly, to the extent to which you can broaden the scope for trading you broaden your opportunities for lower cost emissions. It may well be that there is a small number of industries which provide the low cost means of abatement and we need to develop mechanisms to tap into that and ensure those gains are made. But through an emissions trading scheme they realise a commercial asset by the way of credits which they can trade, so they then have the incentive to realise those gains. So the broader the scheme, the greater the opportunity for low cost reductions.

**Mr McDOUGALL**—I am really learning in this process but something that has become quite clear to me is that the Europeans did not want to talk about sulfur: they wanted to talk only about CO<sub>2</sub>. How do you develop a cross-trading in relation to different types of gases? Can you?

**Mr Stevens**—I am not sure about the reference to sulfur.

**Mr McDOUGALL**—Sulfur emissions in Europe are very high.

**Mr Stevens**—Yes.

**Mr McDOUGALL**—When we hear about the international protocol and when we hear about the European demands in relation to reductions of CO<sub>2</sub>, I cannot find any discussion where they want to talk about the reductions in sulfur output, and my understanding is that that is also a problem gas.

**Mr Stevens**—It is certainly a problem gas generally regionally and it does have an impact on greenhouse, but usually it is a positive impact in that sulfur turns into aerosols which can in fact reduce the greenhouse warming effect. It apparently has had some small impact in that way in the northern hemisphere. But essentially it is not normally regarded as one of the gases subject to the Kyoto Protocols, so it is not surprising to find that they are not saying a lot about it in this context. They were very keen to restrict it to carbon dioxide and not take on the other gases, but I think that is national interest. I do not quite understand the structure of their economy, but certainly we would have much greater emissions of methane than most people. We were very keen, therefore, to see that included.

**Mr BILLSON**—That refrigerant theory to explain the inaccuracy of the models has been disproved as well.

**Mr Stevens**—Science keeps moving.

**Mr BILLSON**—There is an inverse correlation between sulfur emissions and surface temperature going up. The argument has been blown out of the air. That was an argument to protect a model that did not work very well—not that I have a view on these things.

**Mr MOSSFIELD**—These are purely New South Wales type questions and more specifically western Sydney. Outside the electricity generating industry, what are the other greenhouse gas emission problems that the New South Wales government sees, looking at general industry and transport? I would like your views on what greenhouse gas problems would, say, a congested airport create? You may have done some work on that.

**Mr Stevens**—I think I will duck that! The main industry sectors can be read off from the national inventory, in a sense. Primarily, industry emissions come from the use of energy—they are very big users of energy. But there are some other specific sources of greenhouse gases from industry. Aluminium smelters put out some sulfur hexafluoride, which is a very potent gas. We have a lot of methane from the agricultural sector, and a fair amount of carbon dioxide—although not in major proportions—from the cement industry from a chemical process. When limestone is heated some carbon dioxide comes off, but this is not huge in the scale of things. If you go through it sector by sector, energy is clearly the biggest. Transport is large in Australia and New South Wales. Agriculture is large, and so are land use change and forestry questions. Those are the big areas where emissions come from and where work needs to be done.

**Mr MOSSFIELD**—What about an airport situation?

**Mr Stevens**—I thought I had ducked that one. That sounded like very dangerous ground.

**Mr JENKINS**—That is right, frankly.

**Mr MOSSFIELD**—This document that you have produced relates that a third of New South Wales greenhouse gas emissions are the result of the way we manage and use land in particular. Are there any recommendations relating to combining industrial and agricultural activities on, say, the fringes of major cities that would help us overcome greenhouse gas problems?

**Mr Stevens**—I do not think the location of those things is critical; it is really the land area that gets cleared. A lot of the land that is taken up on fringes tends to be land that has already been cleared for agricultural purposes, and that is an issue of another kind. But, as far as greenhouse gas is concerned, they are quite indiscriminate about where it is released, and so on, so I do not think it makes any difference. There are some advantages in some industrial contexts in co-locating the industry with a crop. So, if you were interested in a wood-fired power station, it would make sense to put it close to a forest because the transportation costs for wood are much higher than for other fuels. But generally speaking, no, I do not think the location is an issue.

**CHAIR**—You mentioned agriculture: how do you calculate the greenhouse emissions from agriculture?

**Mr Stevens**—I think that is one of the hard ones, but CSIRO is doing a fair amount of work. We now

have the sheep equivalent for all methane released by animals, so there are estimations. They are clearly not measurements, but they are based on small measurements—your ability to estimate, largely. Clearly agriculture and land use change will be the areas where it is most difficult to get to a state of confidence to be sure that you are trading something that is meaningful if you are doing emissions trading. We may well finish up needing to take a very conservative view of the benefits from sinks because of the uncertainties associated with them, and perhaps a more pessimistic view of agriculture where the negative impacts are significant.

**CHAIR**—I would have thought there was very little clearing of land in Australia today. Most of the clearing has been done, hasn't it?

**Mr Stevens**—The figures that I have seen suggest that it is declining, but there are still areas in New South Wales, and particularly in Queensland, where significant land clearing is still proceeding. There has been some problem tracking down a figure of 150,000 hectares per year which is commonly said for New South Wales, though the government is unable to find exactly how that was established; but it has got there. There is a paucity of information about what is actually happening in that area. Again, the Commonwealth is looking, as part of the national greenhouse strategy development, at improving the science and understanding of the way we estimate that and calculate it.

**CHAIR**—This is the previous minister for lands and agriculture in New South Wales? That was not the information I was given.

**Mr Stevens**—I think you would still not be given it.

**CHAIR**—There are quite a number of areas in New South Wales in particular where forests have actually grown back over the years. Certainly, say from the 1920s and 1930s to recent days, there has been quite a lot of forest grown back.

**Mr Stevens**—It is a natural and healthy tendency of the environment to grow back, as long as you do not do it for too long. Certainly, that is happening, but the balance still seems to be one of clearing rather than revegetation. That is something that we will be looking at very closely and seeing a lot more of deliberate regrowth.

**CHAIR**—Those figures would be very important, considering the Kyoto Protocol.

**Mr Stevens**—Absolutely. I am sure that is one of the reasons why there is a fair amount of money for clearing that up in the Prime Minister's package of last November.

**Mr McDougall**—I know you are starting with electricity, and you have given us the reasons why, but who are the top five players you see in industry who need to be attacked first?

**Mr Stevens**—We would not want to see it as attacking a particular group of people.

**Mr McDougall**—No, I do not mean attacking, I mean tackling them.

**Mr Stevens**—Even tackling them in particular. It really is a matter of looking at an overall scheme and seeing what is practical to do at a stage when the ideas about emissions trading and the measurement of carbon and its securitisation are still very rudimentary. We would probably expect to see the electricity industry brought in as a pilot sooner than anywhere else, because it is relatively straightforward and understandable, but it is fairly problematic to do that in any full scale way, because you are selecting one industry and making it subject to a binding target when other industries are not constrained. The short answer is that I do not have an answer to that. But, if you want to start the list, you start with the electricity sector and the energy sector more broadly.

**Mr McDOUGALL**—You used the words ‘what are the industries that are practicable to do it with.’ Is that because you go for an industry that has a government pricing regulation over it and do not tackle the industries that do not? Then you are starting to pick winners and losers amongst consumers. What do you base that on?

**Mr Stevens**—I would not want to do it in terms of industries; I would want to do it in terms of sectors, and it is sectors where the uncertainties vary. The confidence we have about the figures in the energy sector—and that applies to all industries, of course; they are all caught up in the consequences of what happens in the electricity sector—are much better known and more likely to be able to be developed sooner rather than later. When you move into the agriculture and land use change sectors we are dealing with great deals of uncertainty. It is not clear that it is practical yet to develop a trading scheme that incorporates them. We need to do a lot more work before we would be able to do that.

**Mr BILLSON**—I am interested in your thoughts on an idea that we as a nation should pursue, that is, to have Australia recognised as a centre of some excellence in this area, both as an independent honest broker in verification and compliance and the performance of other nations and through the clean development mechanism. We are in the proximity of a region where a lot of that activity is to take place. Would you support something along that line, perhaps built out of the atmospheric division of the CSIRO and other players, to position Australia as a intellectual hub of this enormous change in the way the world trades?

**Mr Stevens**—There are some very big players in the world who are interested in emissions trading and doing lots of work on it; whether we would be able to become a global centre of excellence is not clear. Certainly, we will need to become very good at it. In general terms, that would be a supportable kind of direction.

**Mr BILLSON**—I think the very big players are the ones that are frightening other very big players. We might be a satisfactory and honourable compromise for some of those big players.

**Mr JENKINS**—To get it in context, what is your best guess based on best science of the proportion of greenhouse emissions that the energy sector releases?

**Mr Stevens**—I do not have that figure at my fingertips, but we are talking somewhere of 50 per cent and up that comes from our energy sector. That includes transport use.

**Mr JENKINS**—As a sector, it is a major contributor?

**Mr Stevens**—Yes, if you start there—

**Mr JENKINS**—Therefore, the type of devices that you can have there are important?

**CHAIR**—You might be able to get an accurate answer from the next witness. I will call it to a halt if no-one else has any questions. We have documents from the New South Wales government and I propose to take the three as exhibit No. 1. Is there any objection to that?

I will go through the documents that have been presented. There is *New South Wales Tackles Greenhouse, Recent Initiatives of the NSW Sustainable Energy Development Authority* and the Department of Energy information sheet titled *Electricity Retail and Greenhouse Gas Measurement Methodology Investigation of Emissions Contracting Scheme*. That is a mouthful, isn't it? There being no objection, it is so ordered.

**Proceedings suspended from 9.56 a.m. to 10.11 a.m.**

**ORCHISON, Mr Keith, Managing Director, Electricity Supply Association of Australia, PO Box A2492, Sydney South, New South Wales 1235**

**SCHAAP, Dr Harry, Assistant Director, Environmental Affairs, Electricity Supply Association of Australia, GPO Box 1823Q, Melbourne, Victoria 3001**

**CHAIR**—I welcome the representatives from the Electricity Supply Association of Australia. We have received a submission from you and have authorised its publication. Do you wish to propose any changes to that submission at this stage?

**Mr Orchison**—No, Mr Chairman.

**CHAIR**—Before we begin our questions, would you like to make a statement?

**Mr Orchison**—We would appreciate being able to do that. I have a copy of it available for the committee and for the *Hansard* reporters. I start by saying that we very much welcome the opportunity to appear before you. May we compliment you on an inquiry which has already elicited a very considerable amount of useful information about stakeholder attitudes in this area.

You referred to our initial submission to you, and we would ask that that be read in conjunction with the submission that was made by the Australian Industry Greenhouse Network, of which ESAA is a member. We subscribe to the AIGN submission to you as well.

In addition, you have submissions from a number of our members. It will be immediately obvious to the committee that there are some differences of opinion within the electricity supply sector at this stage about some aspects of emission trading. It is important, though, to make the point that there is no disagreement that the concept is worth pursuing. Since we made that submission to you, the board of the association, which consists of a dozen chief executives from the industry who are elected by the members, has met and it has agreed to support emissions trading in principle. We referred in that submission to the fact that our board had not yet met. It now has.

We must make the point that that support is subject to a number of caveats. First of all, in our view, a trading scheme has to include all greenhouse gases and emissions from all sectors in order to provide the depth to trading and to genuinely reduce the marginal cost of abatement.

The scheme has to fully accommodate current electricity market arrangements. It must not be a situation that creates instant winners and losers. It has to include an arrangement for carbon credits, to allow for offsets more globally as a means of reducing emission permit requirements. It must accommodate emissions from current plants as well as emissions growth from existing or planned new capacity and from new sources.

Importantly, it has to be assessed fully against the proposals that are being considered at the moment for tax reform. We cannot get ourselves caught in a situation where tax reform introduces additional taxes on this industry and a tradeable emissions system introduces additional cost as well.

My board was careful to make its support for emissions trading dependent also on a satisfactory outcome to the government's proposals, as outlined by the Prime Minister last November, for mandated levels of new renewable electricity power and for power station efficiency standards. We are taking this careful approach because emissions trading is of very great significance to our business. Power generation is responsible for approximately half of Australia's energy related greenhouse emissions, or around a quarter of the total greenhouse gas emissions in Australia. Decisions that are made in this area will impact on our costs and they will also impact on Australia's competitive trading position because they will flow through to now a million business customers.

It is still unclear, we feel, how the greenhouse gas emission limit for Australia that has been decided at Kyoto, as you are well aware, that is eight per cent growth in emissions above the 1990 levels by 2010, will be reconciled with industrial growth, with the government's 1997 package of measures and with the complex land management and emission sequestration issues that are before us.

Australia at present produces 166,000 kWh of electricity and this is projected to rise to 225,000 kWh by 2010. Carbon dioxide emissions from electricity production were 132 million tons in 1990. They are about 150 million tons now and they are forecast to rise on those production figures to around 190 million tons by 2010.

We think it is important to stress to you that that is not a negative approach to the overall issue of abatement. We are very keen to approach this overall issue in a positive way. One of the points that we have sought to make whenever we can is that the carbon intensity of electricity production is being reduced steadily. We forecast that by 2010 it will be down from 881 g/kWh in 1990 to 820 in 2010, and that will reflect greater efficiency in coal fired power with the introduction of gas fired plant—notably co-generation. In addition, a number of our members have got plans for development of renewable electricity supply—wind power, biomass and photovoltaics.

I do not want to take up a great deal of the time of the committee but, if I may, I would like to elaborate just briefly on a few of the issues that I have raised there. Firstly, the need for any trading scheme to focus on all greenhouse gases and emissions from all sectors is highly important to us in order to provide debts to the trading and to genuinely reduce the marginal cost of abatement. We think that a focus on energy related carbon dioxide emissions, or still more narrowly on stationary sources such as electricity generating plant, will fail to capture the wide range of more cost effective abatement opportunities, and this is one of the key issues in all of this.

Secondly, there are a range of permit allocation issues involved in designing a trading scheme that are absolutely critical to its acceptance and its success. For example, we have argued in our submission to you that issuing permits free of charge explicitly recognises the property rights of current generation businesses. Auctioning permits, particularly if the number available is limited, will not only create instant winners and losers but will also potentially impose a substantial cost. Even if a modest price of \$10 per tonne of carbon dioxide was created for the permit price, that would add about \$1.5 billion to the cost of electricity supply.

Thirdly, the designation of permit life periods is crucial to the acceptance of this—

**CHAIR**—Could I just stop you there. In your submission you said million; you just said billion. Is it million?

**Mr Orchison**—It is \$1.5 billion, or \$1,500 million. The billions and the millions do get a little confused from time to time.

Thirdly, the designation of permit life periods is crucial to us in the acceptance of any trading scheme. It is a very complex area and I am sure the committee would understand that businesses need certainty, but we also acknowledge that there is a need to pursue emission reductions. But even if re-issuing of permits is done on a periodic basis, there is going to be some significant business uncertainty built into that. So working out that issue of permit licences is very important.

That point leads on to the next, which is that an effective carbon credit scheme incorporated in emissions trading will reduce the cost of meeting abatement targets by providing opportunities to offset emissions. In this regard we would point out that a credit scheme should not be limited to sequestration of carbon dioxide but should make allowance for energy efficiency programs and for so-called green energy schemes, amongst others. It follows from that that the current efforts of the government to introduce a mandatory level of renewable generation will need to be shaped to provide business with the maximum opportunity to achieve abatement at the lowest possible cost.

In the context of the overall point that any trading scheme cannot be introduced in isolation, I also stress that the proposals need to be framed and assessed against any other proposals for action in the energy sector and especially against the tax reform proposals. The other point, not only from ESAA's point of view but from the point of view of the business community as a whole, is that a domestic emissions trading scheme must be designed and implemented to work with any international arrangements that our government should enter into. Design failures in the scheme that would see us having to buy substantial numbers of international permits and becoming a price taker in the global marketplace would be a serious problem as far as business is concerned in this country. It would also have the effect of locking in existing energy technologies rather than providing business with incentives to pursue new investment.

I have imposed on the time of the committee, but I believe these points are important. One last important point that I would like to make is that there needs to be a clear distinction between the rules for actual trading and the design of the emissions trading scheme. Market trading can take place quite readily, for example, through the Sydney Futures Exchange. The design of the scheme needs to be able to address the complex issues that I have touched on, such as allocation, cost and others.

I would like to conclude these opening remarks with two points. The first is to reiterate the point made by the Australian Industry Greenhouse Network in its submission that there are no domestic or international factors that suggest there is a need for precipitant action in introducing emissions trading. The prudent way forward is to seek input from all affected parties—and again this committee is to be complimented on its success in drawing that initial input—and then to provide time for the emission trading design to be modelled and tested to ensure that its impact on Australia's situation is positive.

With your permission, I would like to table for the committee six principles that we have set out, and



they are principles we share with the rest of the business community for all areas of greenhouse abatement policy. I will not read through them—they are included with the papers I handed out a moment ago, so they are in front of you—but I believe they are essential in considering the design of this and other matters that relate to efficient energy production. Thank you for your indulgence, Mr Chairman. That, for the moment, is all we wish to say.

**CHAIR**—Thank you, Mr Orchison. Dr Schaap, do you wish to make any comment at this stage?

**Dr Schaap**—No, I have no comment, Mr Chairman.

**CHAIR**—I might lead off with a couple of questions. First of all, coal is a very important resource to Australia, not just in the generation of energy but in exports as well. I think something like 50 per cent of our exports still comes from mining, and 100 million tonne of that is coal. Do you see any technology breakthroughs in designs of turbines et cetera in the industry that can lower the emissions that come from this particular area?

**Mr Orchison**—There has already been work done internationally in relation to highly efficient coal burning, and work is being done in Australia by two centres for cooperative research in this area. There is quite considerable potential for improving the way in which we burn coal. Clearly, from Australia's point of view, if we are going to be a coal burning country into the middle of the next century—and I believe we will be—this is an area where we need to support the research and pick up the developments. My colleague might want to comment on that area.

**Dr Schaap**—Very briefly, to make an additional comment, there is a major international effort to look at coal combustion and the greenhouse cycle, the carbon dioxide cycle; that is, the International Energy Agency's greenhouse R&D program. It has done a lot of work on new combustion technologies and placed an envelope on the cost of electricity produced by these new processes. The cost of that envelope is about twice our current generation cost, and that includes both capture and disposal of greenhouse gases produced from coal combustion. But that envelope is coming down. As you are well aware, generation costs are perhaps less than half total electricity supply costs to customers. So, with respect to coal combustion, many of us are very optimistic about the future ability to produce electricity with less CO<sub>2</sub> emissions and also the cost-effective capture and disposal of that CO<sub>2</sub>.

**CHAIR**—Thank you. On that subject of clean fuel, one of the advantages the Europeans established over us in this whole protocol was the fact that they had quite a number of nuclear powered plants. Australia has huge reserves of uranium as well. Where do you see the technology in nuclear power being in relation to, firstly, its safety and, secondly, the by-products which cause the problems?

**Mr Orchison**—I think the nuclear industry—and of course none of my members are at this point in time involved in nuclear power production—has demonstrated worldwide a very high level of safety in both its operations and its dealing with liquid waste. In the situation that we have here in Australia with a competitive market and prices that were already very low by world standards and are now significantly lower as a result of the market, the opportunities to introduce nuclear power are very limited for commercial reasons, let alone all the political issues that would flow from it.

Down the track it may well be that some consideration would be given to nuclear power in Australia, but certainly in the time frame that we are talking about here—in the time frame of the federal government's proposed sustainable energy white paper which is out to 2020—it seems to me personally that it is unlikely to be a factor in Australia. But you are of course entirely right in pointing out that, in Europe in particular and elsewhere, the availability of nuclear power enables some countries to compete with us very solidly in this area. It is one of the crosses we have to bear.

I do not think it is possible to address any of these issues without taking note of the fact that internationally we are in the forefront in introducing a competitive energy market. We are doing it at a low cost to our consumers. In the United States the consumers are effectively being asked to buy a competitive market by compensating the owners of nuclear power for stranded assets. There are very significant amounts of money involved. What we are doing in this country is introducing a market that will benefit the community very greatly at a very low cost.

**CHAIR**—Given that we will be looking at new technology and that some of it probably has not even been discovered at this particular stage, do you see this tradeable emissions program giving the incentives for people to go out there and do the R&D that is necessary to come up with this new technology?

**Mr Orchison**—There are two points. The first is that in the short term, as a result of the market and as a result of the government's decision on mandated renewables, there are incentives in place for industry to pursue a range of renewable areas. My colleagues from Pacific Power, who will be addressing you later, are working in areas including wind power and rooftop solar cells. My colleagues in Tasmania see the abilities of wind power and building Basslink as a means of taking advantage of both the market and the mandate. The ESAA are quite positive about where we are going in the next 10 to 15 years in terms of renewables.

The longer term issue is how government in this country is prepared to work in partnership with the business community to look at those areas of renewables and other forms of energy that are not commercial at the moment, and how far government is prepared to go to be a supporter of that. The ESAA are on the public record as expressing concern about the closure of the Energy Research and Development Corporation. We are on the public record as urging the government to work with us and others in business to find a means of ensuring that the next levels of technology—the ones that you are referring to—are areas that we are pursuing in a sensible fashion.

**CHAIR**—You did mention very clearly that you believe that in any assessment of greenhouse gases all contributors should be assessed, and that should be taken into consideration. Given that we have already had evidence that some of this is fairly obscure as to how you calculate it, would you see that in this particular tradeable area there may be some sections of it that would have to be covered by government as a CSO?

**Mr Orchison**—Yes. It is a fairly complicated area. I have had the opportunity to read all the submissions—and there are a fair number. One of the submissions that is before you—I believe I am right in saying this—from my colleagues at Stanwell, raises the issue of whether departments of transport might not buy the permits for the transport sector and then pass the costs on through fees and so on. This is all something that has to be worked out very carefully. Not only ESAA but all the major business and resource

associations in Australia are of the view that when we go down this road we have to do it with all greenhouse gases and all sectors, to ensure that we really do have a workable and equitable system. It is not going to be easy to do that.

**Mr EOIN CAMERON**—You touched on this briefly: what standard in world terms are the coal-burning power stations that we have here in Australia? How good are they compared with those internationally? Are there better examples world wide and are there worse examples, for instance China, to whom we export coal? What are their coal burners like?

**Dr Schaap**—By world standards we are fairly fortunate in that we have mostly fairly new plant, in other words, power plants post-1980. That plant is indeed fairly efficient with efficiencies, particularly of black coal plant, approaching 37 or 38 per cent. It is currently not the top of the range. The main factor of that is one of economics. Other countries import fuel such as coal from Australia. Coal is expensive to import and, hence, they can make it commercially more viable to invest in more efficient power plant. But the increase in efficiency is not all that great. At the moment the most efficient black coal plant, using a supercritical cycle, is somewhere around 41 or 42 per cent efficiency, compared with the 37 per cent.

With respect to comments on developing countries, in 1990 China's power plant efficiency was only 15 per cent, which is less than half of ours. It has now come up to about 25 per cent. The significance of countries like Australia and others investing in China with efficient technologies is therefore critically important, given the enormous growth in the electricity sector within that country.

**CHAIR**—And earning a credit.

**Dr Schaap**—Indeed. It is the clean development mechanism or whatever.

**Mr Orchison**—That is right. In fact, Mr Cameron, I would like to add to Harry Schaap's comment to you. One of the things that particularly interests us is the opportunities in a number of countries—and India is a good example—where the skills that we have in Australia in terms of both the ability to run power stations and the ability to efficiently run transmission and distribution systems can be put to considerable use. There is, first of all, a global greenhouse benefit out of that. Secondly, as the chairman says, if we can get the credit side of this sorted out, there may well be a considerable advantage to Australia in being able to do it.

Among the resources that we have in this country are some very good people in all aspects of electricity production. We are among the world's best and in the region that we operate in—and the Indian subcontinent needs to be included in that—there are many opportunities. It is very difficult to achieve the kind of relationships that will be of benefit in this, but we as ESAA have had the opportunity to address government departments on this issue a number of times recently. Certainly, in terms of credits that might be obtained in the long term of looking at an international trading arrangement in emissions, this is something that is in our interest to pursue because we have a very fine engineering resource that can be put to good use in this regard.

**Mr BILLSON**—The interplay between the relative economy in our coal-burning energy sector presents a disincentive to some of the new technologies. How is the ESAA addressing that? You mentioned

government support for new technologies and you mentioned the research and development area where, I understand, the technology was being developed but the gap between its cost and the relative cheapness of coal-fire power meant commercialisation was almost out of the question. Can you elaborate a bit more on what sort of support you would envisage to try to bridge that gap?

**Mr Orchison**—I think there are a couple of points that are worth making, and my colleague who is very heavily involved in this area might wish to add some. From my vantage point, I think the first thing that is worth saying is in those areas where supply and demand are almost in balance. For example, in Queensland, there are opportunities and incentives to pursue renewable production through cogeneration based on sugarcane residue. Two of my member companies have announced that over a period out to 2003 they are looking at the possibility of building some 1,000 megawatts of biomass based cogeneration. So there are opportunities that the market will drive.

I referred earlier to the interest that the hydro-electric corporation in Tasmania has of having Basslink built and then building wind power in Tasmania to enable them to export into the mainland market. The great advantage of wind power in that regard is you do not have to build 1,000 megawatts of it in one go. You can do it in 10 or 20 megawatt increments.

The other side of it is the decision of the federal government to introduce this mandated level of renewables, although it is a very big challenge. Of the order of 4,000 megawatts of new renewable capacity will have to be built to achieve it. That will require in excess of \$5 billion of investment. Nonetheless, if we can find a way of making it work efficiently, it provides a way of also addressing this. So within the market system, there are some fairly good opportunities.

The other area which has been pioneered to an extent here in New South Wales is the so-called green power concept, because there are customers who are willing to pay a premium to see renewable power brought into the system. Although this has started very slowly—and I cannot say it surprises us that it has—our own research has shown that there is a definite interest out there. How far that will develop over the next decade is something of some considerable interest in the industry. Dr Schaap is very heavily involved in this side of things, both domestically and with the International Energy Association, and he might wish to add to that.

**Dr Schaap**—Yes. Between the end of last year and 2010 we will be adding something like 60,000 gigawatt hours of energy to the system—that is in energy not in planned capacity. Even taking into account the current excess capacity perhaps in New South Wales and Victoria, what is needed in that sort of block is at least something like 30,000 to 40,000 gigawatt hours of new gas fired plant, because the economics will be right. We currently have a very low price in the competitive market because of the excess supply. That supply will work itself through the system within the next five to seven years. Then, clearly, the attractiveness of gas will come to the fore because it provides small incremental blocks embedded within the system very effectively.

If you take your vision to 2010 and look at 60,000 gigawatt hours compared to what we generate today, which is about 166,000 gigawatts, then big blocks will need to be taken up by gas, some of the existing excess coal and, as Keith pointed out, the 10,000 to 15,000 gigawatt hours of new renewable energy.

That is a very large challenge.

**Mr BILLSON**—In your forward projections the 40 per cent growth in emissions over the forecast period is largely a product of improved productivity in established plant, like Yallourn's where you are in your low 70s up time and you are now pushing 90s and the like. With that improved up time, productivity is generating higher levels of electricity from established technology. Is that what is factored into these growth forecasts?

**Dr Schaap**—Yes. The best way to look at it, because growth is fairly large, is actually what I call the carbon intensity of producing electricity. Again, Keith touched on that. It is important to see that the intensity is being reduced from about—

**Mr BILLSON**—This is this 881 to 820?

**Dr Schaap**—Yes. The point is that, if you take into account growth and you do some factors and get it right, you can reduce that intensity further and quite significantly. So per unit of electricity output we can, over that period of time, reduce emissions maybe by 15 to 20 per cent within the right economic commercial climate.

**Mr BILLSON**—What are your customers telling you, Mr Orchison? I see some confounding impacts of the clean development mechanism operating in non-annex 1 countries, where we will, theoretically, be taking out technology and saying to countries outside the loop, 'Here you go,' producing energy at a comparatively cheap price without the carbon emissions overlay. How long are we going to hang on to our aluminium producers and the like unless we put a carbon tariff on those products when they come back into the annex 1 economies?

**Mr Orchison**—The difficulty of putting tariffs back on things is obvious to you. The chances are not high. The point you raise, however, is a very serious one. The so-called carbon leakage issue is of critical importance to Australia. It is an issue that both the present federal government and its predecessor were very conscious of in all the negotiations that have gone on with regard to greenhouse. It is the reason that I stressed, in my opening comments, the fact that remaining a competitive country in terms of energy prices is absolutely fundamental to our overall policy.

The curse of policy making in this country over many years has been the way in which decisions are made in compartments. We simply cannot afford, in the area that we are now involved in, to make decisions for good environmental reasons but decisions that are bad economics. We have to be able to address both the economic goals that we have and the environmental ones. I refer you to those principles that we have listed and put on the table. They all relate to the fact that abatement policies must be cost efficient. We have to pursue policies that are going to enable us to be both better managers of our environment and stronger competitors than we are today because if, for example, the Japanese decide that in order to pursue their commitments they will move more of their heavy industry offshore then we are going to find ourselves competing with, for example, countries in South America, which have extraordinary amounts of hydro capacity available to them and, economically speaking, will kill for the opportunity. If we want to stay in that area of attracting energy intensive industry then we have to keep our minds firmly fixed on the costs.

We have some confidence that the approach of the government, and indeed the approach of the previous government, was oriented towards this. We had something of a hiccup in relation to the carbon tax in 1994 but the cabinet at the time came to a sensible decision. I think there is a lot more of a bipartisan attitude amongst the major parties to energy policy in this country than there is in most other areas.

**Mr BILLSON**—In terms of the irony, though, of the clean development mechanism as possibly a tool to accelerate that shift of energy intensive industries away from the energy producers like yourselves into the non-Kyoto annex 1 countries, have you had some discussions with your international colleagues—that international peak body of energy producers you mentioned earlier—about how you would deal with the potential trade advantage that may be available to countries outside the Kyoto loop?

**Mr Orchison**—I think that the International Energy Association, of which Australia is a member along with all the other developed nations, is very conscious of this fact. It is an issue for the United States, it is an issue for a number of other countries around the world, it is an issue for Canada. The bottom line in all of this is that if the developing nations, particularly the rapidly industrialising developing nations, do not embrace an abatement policy then ultimately, yes, we are going to have a real problem. Kyoto is not the end; Kyoto is probably a very small first step.

**Dr Schaap**—Under the Kyoto Protocol these flexibility measures, such as emissions trading, the clean development mechanism, and activities implemented jointly, are very much secondary to the domestic responses by a nation. That is our commitment under the protocol. Looking at the domestic response, the range of measures which we have been building up since 1988, including the ESD process, the national greenhouse response strategy, greenhouse 21 and last November's Prime Minister package, provide a very good measure for the domestic response, quite apart from emissions trading. The Prime Minister's package, if it is fully implemented, will in fact achieve our Kyoto objectives of plus eight per cent over the 1990 levels. That is not well understood by a lot of people.

**Mr BILLSON**—In terms of proportionality of effort—and I can understand the difficulty you have with your membership, Keith, so either way you have managed to bring some consensus view to the table—if we accommodate that 40 per cent growth in forecast emissions for your sector, and given the proportion the energy sector represents as an emitter, that is going to leave an awesome task for everybody else to try and bring us back to our Kyoto targets. Short of us all walking to work under electric lights or electric cars, for instance, how do you feel the industry is going to argue that case in the face of a whole lot of other interests that also are smaller emitters in proportional terms?

**Mr Orchison**—I think, Mr Billson, the fact is it is the business community across the spectrum, and I referred earlier to the Australian Industry Greenhouse Network which represents 10 industry sectors. We all understand that, if we do not work together in this area, we are going to end up disadvantaging the whole. There is a very strong driver on our side to ensure, first of all, that there is a consensus view in our own industry. In a sense, this inquiry falls at a bad time because we have not worked this through in detail within our own industry, as is very obvious by some of the submissions you have. That needs to be sorted out. Then, as the business community as a whole, we need to get our minds across where we wish to go. In that regard, we have probably made quite a lot of progress because the business community saw emissions trading coming as an issue and at least has its mind clearly around the principles it wishes to embrace, which my

board in turn has embraced on behalf of ESAA.

**Mr BILLSON**—So a good outcome for electricity is not just good for the electricity sector as a key business input, it is good for all the producing interests in our country?

**Mr Orchison**—As I keep on reminding my members, the rest of industry out there is our customers. We sell billions of dollars worth of electricity to them. If the Prime Minister's ambition to achieve four per cent growth in the economy per year is achieved, our members will be beneficiaries, as will the customers. We really do have to work together on this.

The other factor in all of this is that we are engaged in a process of privatisation. I had a meeting with Minister Parer and officers of his department last week in which I made the point that we now have some \$30 billion of investment from Australia and abroad in the privatised electricity industry. By around 2001 that figure will be of the order of \$80 billion. That investment will need to be protected, too, and we protect that by working with our customers to ensure that the size of the pie is bigger for all of us. Otherwise, we have all got a problem.

**Mr MOSSFIELD**—I suppose there is a certain amount of overlap in the questions, but in speaking about the carbon credit scheme—which includes the carbon sinks, the end-user, energy efficiency, international offsets and the green energy scheme—how would you see this system being measured and administrated?

**Dr Schaap**—It is a fairly challenging question. While carbon credits are perhaps not so difficult to establish, they are certainly difficult to measure, verify and account for. Some carbon credits are a lot easier than others. For instance, with green energy schemes, where you use wind power or photovoltaics or landfill gas, you know precisely what the energy output is. Hence, you can equate that directly to savings compared with if that energy was produced by, say, coal-based electricity, or whatever. So you can get fairly precise measures.

The challenge comes in, obviously, on the area of forestry and land management—the whole area of sequestration—and you can see the uncertainty in the large number of figures. In Australia's National Greenhouse Gas Inventory, the figures are systematically being reviewed downwards over the five- or six-year period. It is an important area because sequestration through, say, tree planting is a very significant and important issue. The methodologies for actually doing the accounting are still very poor, and they will need to advance a lot more to give certainty that you are in fact buying the credits you are paying for. For this industry, with its focus on electricity production, perhaps the issue of renewables is fairly straightforward in assigning credits.

The more interesting one to me is energy efficiency—how you deal with, say, a business that deliberately invests in customer efficiency. On the one hand, you can almost say, 'Its sales have gone, therefore its greenhouse gas reductions have gone down,' but it might well be dealing with customers to whom it does not sell electricity directly. I am a great believer in needing to account for efficiency in this whole equation. How you do it is going to be very complex.

**Mr Orchison**—I would add one point to the end of that. In creating whatever scheme we have domestically, it has to be able to butt with our international commitments. The worst thing that can happen here is that we end up with a domestic scheme that is sitting athwart the international one, which will create all sorts of problems.

**CHAIR**—Do you believe our scheme should be national?

**Mr Orchison**—There is a consensus that we ought to achieve a domestic scheme as quickly as we can, but not to rush it in a foolhardy fashion. At the same time, obviously at an international level, our government is working to build it to be part of an international scheme. The two must fit with each other. That is really what we are saying.

**CHAIR**—I understand that. But it would be even more important, would it not, not to have six or seven states and the territories in Australia—

**Mr Orchison**—Our view very straightforwardly is that this has to be a national scheme. Apart from anything else, as far as electricity supply is concerned, we are busy beating down the bounds of the states on a day-by-day basis. Ultimately, we will have, on the eastern seaboard of Australia, an electricity market that is as near national as you can get in a country of our kind.

**Mr McDOUGALL**—I would just like to understand your comments a little bit more in relation to some figures you gave earlier. I think you said that currently 130 million tonnes of CO<sub>2</sub> is produced—

**Mr Orchison**—That was 1990.

**Mr McDOUGALL**—And you are looking at 190 million tonnes in 2010. Obviously in there there is an introduction period of natural gas into energy production. If you stuck with coal, where would you be in 2010? What component of that growth is the benefit coming out of the introduction of natural gas, and where would natural gas be as a generating source of that total 190 million tonnes?

**Mr Orchison**—Harry, you would have some figures in your head for that.

**Dr Schaap**—Yes, although they are not immediately obvious. Perhaps I will prepare a note and give it to the committee separately. Putting it basically, what we have done in our calculations is to allow for something like 20 per cent of all new generation being based on gas and not on coal, and that is a very conservative figure. It could be a lot higher. It depends very much on how the market for new generation develops within that time period. We have allowed roughly 20 per cent of generation coming from a combined cycle natural gas and some co-generation as well.

**Mr McDOUGALL**—But only in new plant?

**Dr Schaap**—Only in new plant, yes. Currently, the amount of gas in the system is about 7.3 per cent.

**Mr Orchison**—One of the points that needs to be made in that regard, Mr McDougall, is that the



national market rules are still being worked through, both in terms of the gas market and refining the electricity market. At the moment there is an inquiry being conducted by the national electricity code administrator, which is the regulator of the market, into transmission and distribution network prices. How that falls out will have some impact on, for example, the level of co-generation development over the next five or 10 years. There are a number of things that relate to this, and certainly the workings of the market is one of them.

**Dr Schaap**—The challenge for gas is to try to capture two-thirds of the growth required—40,000 gigawatt hours—between now and 2010, and that is a tall ask.

**Mr Orchison**—Of course, the other point about it is that gas prices will have a role in that. Some of my members have strong views about the levels of gas prices and the levels of competition that are available in the gas market, but perhaps that is an issue for another day.

**Mr McDOUGALL**—The interesting part to me in it is that we are seeing a growth in the gas export market, and obviously a lot of that is going north into Asia.

**Mr Orchison**—Sure.

**Mr McDOUGALL**—And a lot of those countries are outside this protocol at the moment. What impact does that have in relation to their effectiveness in cost of production benefits? If we do not keep pace with that in our own generation capacity, we may lose market share on an international basis. I am trying to relate the two together, if you know what I mean.

**Mr Orchison**—I understand where you are coming from. I think a couple of points need to be made. One of them is that the principal purchasers of liquid natural gas from Australia are Korea and Japan. Korea is not yet caught in the Kyoto Protocol but it is now a member of the OECD and inevitably it will be. Japan, of course, is very heavily caught in the protocol. So I do not think in that sense it creates a problem.

The other is, of course, that the gas we are exporting is from areas that are very remote from our own major areas of demand. The costs of bringing that gas across Australia in one way or the other and the political difficulties that would be involved in having an LNG collecting point somewhere on the coast of New South Wales are not inconsiderable. I think it is not an issue where we would be looking at saying, 'Well, perhaps we shouldn't be selling them the gas,' because there are very considerable trading advantages to Australia in doing just that.

The issue here is to be able, as Harry Schaap said earlier, to reduce the carbon intensity of our electricity supply while simultaneously keeping our electricity prices down to a competitive level. It is a pretty hard trick but over a period now of more than a decade we have been able to demonstrate a capacity to do it, and that very largely lies in two areas: the skill that my members have brought to increasing their productivity levels and the exercise that we have pursued to develop a market. Those two things together are key areas for us in keeping our prices down to a low level.

**Mr McDOUGALL**—That leads me to the question that you raised earlier about taxation. You

mentioned in your submission that taxation measures could impact significantly on the appropriateness and effectiveness of the emissions trading scheme. Based on what we have just been talking about, could you expand a little bit more on this tax reform?

**Mr Orchison**—I think the concern we have in that regard—and it is not just a concern that ESAA has, it is a concern that is shared by the business associations—is that there is a cost element in going down this road of emissions trading. Our concern is to keep it to a minimum but if, for example, a decision was made to auction emission permits it is in effect a tax on existing producers of electricity. If at the same time it fell out of the tax reform process that there was some tax on energy with revenue and other intentions, we could end up here faced with a double problem. Again, I come back to the point I made earlier, that the only rational way in which to develop a sustainable energy policy for Australia is to have a broad approach to it where everything is tested against energy security, low cost of energy and its impact on the environment. It is a balancing act that federal government, state government, my industry and others have to pursue.

**CHAIR**—Could we pursue that just a little further? In setting a cap where we must start from, how would you go about that? Would you make an assessment of efficiencies within particular generators, or within industries, to set that cap and would you then have a year by year reduction in it so that you are driving efficiencies?

**Mr Orchison**—I think it is a little early to be testing us on the detail of it in that regard, particularly because there are a number of—

**CHAIR**—We are being tested with it at the present time.

**Mr Orchison**—Yes, indeed, and I appreciate the point but at the end of the day I can only speak on a consensus basis for my members and we have not yet had the opportunity to get into that much detail. But I think what is important in this is that we have a pretty fair idea of where emissions are going to go over the period after 2010 in relation to operating an efficient economy. We have to be able to accommodate that because Kyoto allows us to. We have to be able to accommodate that.

We also have to build into this a sensible element of abatement, and it will not only come from emissions trading. I think the key here is that, while this is one of the most important policy areas that could be addressed in Australia today, it is not the only greenhouse abatement area that is being addressed, and we do need to bear that in mind. I do not know whether Harry wants to buy in behind me on that.

**Dr Schaap**—I think up to a large degree the Prime Minister's November package does set a cap. It basically mandates two per cent new renewable electricity by 2010, and we can put a fairly good figure on that, approximately 9 million tonnes of CO<sub>2</sub>. It also mandates, and that is the other question asked by Mr Billson earlier, efficiency standards for power generation. We can put a fairly good figure on that as well at around about 4 million tonnes. If you put those sorts of caps together and put in the rest of the Prime Minister's package to do with non-stationary energy measures, you in fact get to our Kyoto figure fairly well and fairly quickly. So within an emission trading regime, if we can think about what are the elements of that package that are driving these figures down anyway and how that can be linked to an effective emissions trading system to make it happen perhaps more cost effectively, I think we will get there quite quickly in

overall emission terms.

**CHAIR**—You were mentioning earlier that you did not believe that the licences should be auctioned, that there was a cost involved with that, and there is an initial cost; we concede that. But if, for instance, someone was able to drive their efficiencies faster than what the set standards were, by two per cent or whatever, wouldn't there be a possibility of redeeming those costs by selling them back if you in fact achieved more than you—

**Mr Orchison**—The possibility is certainly there. I think an important part of this scheme is going to be how permits are allocated and how they may be traded, redeemed, withdrawn. The important thing here from the point of view of business generally is that this is an issue of property rights at the end of the day and there is a considerable degree of concern that people who have invested many billions of dollars in industry, and not just my industry, should not be put at some significant disadvantage. But it is an area where I think the experts are going to have to present us with a series of options and they are going to have to be evaluated in terms of their impact on the economy and whatever benefits they may bring in terms of environmental gains. Then at the end of the day we are obviously going to have to make a choice. As we said in our introductory comments, it is one of the more complicated areas of all this. There have been examples in other areas of industry here and overseas where the issue of property rights and who can take what when leads to rather significant litigation. I think one of the things that we would want to avoid in all of this is turning this into a lawyers' picnic, with due respects to anyone on your committee who may in a past life have been a lawyer.

**Dr Schaap**—An auction scheme even at \$10, as we point out in our paper, would add \$1.5 billion to the cost of this industry. It is money probably better used to get in place the green initiatives because, based on an auction scheme, it is akin to a carbon tax. The industry is paying out \$1.5 billion to acquire the permits. Our worry is that it contracts the amount available for innovative research and coming to grips with some real greenhouse measures such as the renewable packages and so on. I would rather have the money kept within the industry to deliver the two per cent outcomes, mandated as they are, than have the money floating around through a permit system.

**CHAIR**—Would not the reverse be true, though? If in fact you were set two per cent, or whatever the mandatory levels were, and there was an incentive for you to achieve better than that and in fact you achieved better than that, you could redeem some of the money you had expended in the first place? Isn't it more an incentive to do better than the mandatory level?

**Dr Schaap**—But it would be even more attractive if the permits were initially issued free of charge, because then you actually have the property to sell them and you can actually do more with your renewables.

**CHAIR**—But you cannot redeem it then because there is no money to redeem, is there? If it was given for nothing, who is going to buy them if you wanted them redeemed?

**Dr Schaap**—Because the market will quickly set a price. I mean the US SO<sub>2</sub> trading system is a classic example where permits were initially issued free of charge, and then systematically reduced by government, with a small percentage—in fact only about eight or nine per cent—being actually available for

allocation through an auction system initially. That established a market fairly quickly at a fairly level and stable price of about \$130 per ton of CO<sub>2</sub>.

**Mr BILLSON**—One-twelfth of what was forecast.

**Dr Schaap**—Indeed.

**Mr BILLSON**—On that same subject, the issue about property right versus licences is a delicacy of a discussion point. The theory of issuing them for nothing and calling them a property right is creating new value in your businesses that you have not earned. Now I would have thought an issuing of them at a level that does not penalise you makes sense. If you are more efficient, then you can get some benefit out of it. But if you are less efficient under the US Clean Air Act the punitive measures that kick in for non-performance are squillion dollar fines and acquisition of twice your non-performance because you cannot be trusted to the next accounting period.

All of those things say to me that an ongoing licence in perpetuity without some scale back over time just makes a nonsense of it. So I am just wondering how you reconcile those quite defensible positions in their own right that you have. When you throw them all together they are entirely contradictory in some respects in my mind.

**Dr Schaap**—It is the scale down over time, which I think will impose the market discipline.

**Mr BILLSON**—How do we go with it? How else are we going to get something happening? Be generous with us here.

**CHAIR**—If we get them for nothing, we redeem so many every year and gradually scale them back.

**Mr BILLSON**—You claw them back. There are some performance targets to be met which are mandated at the moment, but there is no framework there. Let us claw them back. Let us give a new entrant some opportunity to participate. This blocks them out.

**Mr Orchison**—Inevitably government will insist on some sort of performance factor being built into it. My answer to Mr Billson is, yes, by all means let's go with it, but let's go with it in a way that means we do not have to keep on fixing it into the future.

I was saying to Senator Parer and his department last week that from my South African background there is a Zulu expression that says, 'Hamba gahle,' which translates as 'hasten slowly'. It is the best possible piece of advice that can be given on this. We have got to get on with it, but let's make sure that, having got on with it, we get it right, because the costs literally of not getting it right are very severe.

**Mr BILLSON**—But we can get over that, could we not, if those who are initially allocated the permits and they roll over are discounted over a period of time? As they are discounted, a new capacity comes on board that is auctioned. Those auctioned ones do not discount; they retain their value and together we then work towards our Kyoto targets over time. We get a market and we get capacity for new entrants.

For the non-performers they know it is going to cost them and they need to invest in some technology. If you do better than you need to, you are rewarded by something that then becomes a property right because of your performance—not a property right because of your non-performance, and there is a world of difference in that.

**Mr Orchison**—In the broad, I agree with you. Rule one for industry association managers is do not make policy on the run. Rule two is never do it when the *Hansard* reporters are taking down every word.

**Mr BILLSON**—What about rule three, which is take your constituency with you; all of them.

**Mr Orchison**—I am sure that the committee is aware of this, but the point is that in the ABARE exercise that is just under way—and there is a conference due in the very near future—there is going to be some very considerable discussion involved there on many of the points that Mr Billson is making. These are important issues, but there are all sorts of angles to them that we are going to have to deal with. Even within ESAA we have a broad single view, let alone across the spectrum of a dozen industries. I appreciate your need to get a resolution, but it is going to take a while.

**CHAIR**—Thank you, Mr Orchison and Dr Schaap. You have presented us with one document which will be classed as exhibit No. 2. The document is titled, *Six principles for greenhouse policy*. Is there any objection to this being marked as an exhibit? If not, it is so ordered. Thank you very much.

[11.17 a.m.]

**FLANAGAN, Mr Paul James, Environmental Manager, Pacific Power, Park and Elizabeth Streets, Sydney, New South Wales 2000**

**LANG, Dr Robert David, General Manager, Operations and Marketing, Pacific Power, Cnr Park and Elizabeth Streets, Sydney, New South Wales 2000**

**OATES, Mr Lindsay Edwin, National Business Development Manager, Pacific Power, GPO Box 5257, Sydney, New South Wales 2001**

**CHAIR**—We have received a submission from you and have authorised its publication. Do you wish to propose any changes to that submission at this stage?

**Dr Lang**—No, we do not.

**CHAIR**—Would you like to make an opening statement?

**Dr Lang**—Yes. We have circulated a short presentation which I would like to very briefly run through. By way of introduction, Pacific Power is a generator in the national electricity market. We have a vision of leading the transition to a sustainable energy future. We have a large black coal-fired power station in New South Wales and we also have a number of renewable energy generators—mainly hydro at this point—but a number of other projects including the Crookwell wind farm which will be operational next month. It will be the largest wind farm in Australia. We also have the world's largest solar village at Homebush in Sydney which is currently under construction.

We expect to have renewable generation plants in wind, solar, hydro and potentially geothermal around the country in some years to come. We also did the first green power trade in Australia last year and we continue to sell over 100 gigawatt hours per annum of green energy into the market at a premium. We see emissions trading as an important complement to other policy initiatives to achieve greenhouse gas reductions efficiently and equitably. I might also add that Pacific Power does some significant work in Asia in taking this sort of technology overseas.

In terms of emissions trading, I would like to mention five key issues that we believe are based on the foundation of Kyoto, the environmental imperatives and the ability of business to respond. The five questions are: why emissions trading; what is it we are actually going to trade; when should a domestic scheme commence; who should be involved; and how could it be done?

On the first question of why emissions trading, we see the purpose of emissions trading is to reduce Australia's greenhouse emissions, obviously to meet its Kyoto requirements of eight per cent above 1990 levels. We believe there is tremendous scope for achieving this emissions reduction by a variety of different means that makes it worthwhile to establish a market for emissions trading so players can achieve this most cost effectively.

We also see emissions trading as being environmentally effective by ensuring that emission rights are available each year and progressively reduced—or using some other mechanism over time—so that there is a constraint on total emissions to meet the target. We also believe this could be done equitably by allocating rights and providing some market drivers, so that everyone shares the burden but no-one is severely penalised. In this way, we believe that emissions trading is a very rational way of achieving desired results, as well as a strong market share for renewables to meet the federal government's two per cent renewable energy target.

On the question of what is emissions trading, it is simply, in our view, the right to emit a quantity of greenhouse gases in a specified time frame. It needs to be a market tradeable and bankable commodity. We also believe that it has to be coupled with the criteria that there is a reducing amount of new permits released each year, or some other mechanism, with annual accounting where emissions can be tallied with rights, cancelled out and which obviously leads to penalties if there are insufficient credits. That becomes an emissions trading scheme that is able to be dealt with.

On the question of when emissions trading should commence, we believe it should start as soon as possible in Australia for a number of reasons. Firstly, there are already organisations overseas that are seeking to purchase and trade emission credits in Australia. We are aware of a number of opportunities available right now for these sorts of things to be done. If we are able in Australia to start securing these credits, that will certainly be to our competitive advantage.

Secondly, the development of an Australian scheme will provide the background for Australia to participate in the international debate that is currently under way, on setting up such international emissions trading arrangements. Therefore we will hope to influence those and be advantaged by them.

Thirdly, it is certainly true—as we have heard from the ESAA—that emissions in Australia are continuing to grow. The electricity industry already has exceeded 1990 levels by a considerable margin. To delay any abatement measures is certainly going to mean that the problem is not going to get any simpler to solve. By having an early start we will enable progressive implementation and the longest possible lead time to plan a smooth transition to lower greenhouse emissions and hence minimise disruption to industry—not only to the electricity industry but, as Keith Orchison said earlier, to all our customers.

The earlier implementation will of course involve some costs and effort. However, we believe that the cost of delaying it is even greater, not the least of which will be the competitive disadvantage to Australian companies as we try to play catch-up internationally. The answer is that it should be done as soon as possible and we at Pacific Power believe that July 1999 is a feasible start date for an initial scheme, quickly expanding it to cover the majority of initiatives by a year and a half later.

On the question of who should start emission trading, we believe there is significant advantage in starting with the electricity industry first and then quickly expanding to other sectors for the following reasons: the electricity industry is certainly a large source of emissions; there is a relatively small number of participants in the industry—only 20 or so generators in the national electricity market; we have experience in similar trading arrangements in the national market for trading electricity; and we are already doing green power trades and it would be a relatively straightforward adjustment to go to full emissions trading.

Also, given the long asset life of an electricity generating plant and the need for early signals for the development of new generators, such a scheme—if put in place soon—would mean that we would get the right sort of plant coming on-line in years to come. In short, electricity should be first and the others would certainly include sequestration, on which we have done some work.

The final question is: how can a practical emissions trading scheme be implemented? Obviously, the initial allocation of rights needs to be equitable and they need to be tradeable. As for the methodology for allocation, we see that there is some advantage in an amount being allocated free and the rest being auctioned. Perhaps we are somewhat more far seeing than our ESAA colleagues.

On the export industries, we also believe there may be some advantage in initially quarantining them from domestic emissions trading to avoid disadvantaging them in international markets. The secondary market for trading these rights could utilise existing systems. I am sure the futures exchange representatives will talk to you about that later in the day. Finally, with some annual accounting and—as I have mentioned—the gradual reduction in rights over time, that will allow for a steady and reasonable introduction of an Australian developed scheme that makes sense.

In summary, these are the answers to the five key issues we raised at the start. Why emissions trading? To achieve least cost reduction. What are we actually trading? The rights to emit CO<sub>2</sub> or equivalents. When should that start? As soon as possible, but no later than 1999-2000. Who should be involved? Initially, the electricity industry and then expand it. How can an effective scheme work? We have outlined a proposal which is simply a first pass at what we believe will be a workable, Australian scheme.

I will conclude by saying that Australia has an opportunity to show leadership and to create for itself a significant competitive advantage as the world responds to minimise greenhouse emissions. Attached to the back of our presentation is a summary of our 14-point plan for a possible domestic trading scheme.

**CHAIR**—Thank you, Dr Lang. Paul Flanagan, do you want to make a statement?

**Mr Flanagan**—No, thank you.

**CHAIR**—It has been said this morning that probably the optimum proposal is an international market in tradeable rights. Do you see opportunities for your particular corporation to gain credits overseas in such a market?

**Dr Lang**—We certainly believe there are. One of the advantages of an emissions trading scheme is the effect that you can achieve the least cost emissions reduction by having the broadest possible range. We heard earlier that should cover all the players in one particular industry segment, for example, and that maybe it meant multiple industry segments. The obvious extension of that is overseas trading as well. There are already such trades available today, which we could certainly enter into. That is not to mention the opportunities in Asia as time progresses. Such offsets could be included here.

**CHAIR**—You are already supplying technology to China, aren't you?



**Dr Lang**—Yes, we are. Under our Pacific Power International work, we do a lot of work in several Asian countries, particularly in China of late; helping them not only to develop new power generators but also to improve their existing plant.

**CHAIR**—Do you see the many Australian people involved in the movement of technology as giving us a competitive edge? Is there technology available in Australia at the present time that is driving efficiency even more in the coal generating area?

**Dr Lang**—Yes, and Lindsay Oates might be able to expand on this. The advantage we have here in Australia is that we are not only running probably some of the best coal fired plant in the world at the moment and are improving all the time through some of the R&D work that was mentioned by the ESAA earlier, but we are also getting very rapidly into renewable energy technologies, which are coming down in cost and improving in technology every year. Those advantages are something that we can export.

**Mr Oates**—I would like to briefly outline the projects we are currently involved in. That will give you an idea of the breadth of technology that we have capability in. We are looking at combined cycle plants down in the Illawarra area and in Wagga Wagga. Currently being built over at Homebush is the world's largest solar suburb with PVs on the roof. That is a particularly interesting development because the PVs will produce in a year enough electricity to supply each house's annual electricity requirements. Obviously, at night electricity will be supplied from the grid to the particular house but during the day it will be supplied from the house back to the grid. We are getting our hands-on experience in that development right now.

We are building Australia's largest wind farm at Crookwell. The wind turbines were erected last week and they will be operational in a few months. We believe that there is significant potential both in Australia and overseas for wind development. Our expertise is not in building and putting up wind turbines; it is identifying where to put the wind turbines. Anyone who wants to know where to build a wind farm has to know exactly the right spots where they are going to extract the maximum amount of energy from the wind. That means analysing with very sophisticated computer models where the hot spots are on the terrain. It is akin to oil exploration: knowing where to drill. Where to put your wind towers is the same as where to drill that hole.

We have experience in operating hydro plants. We have got 350 megawatts of hydro capacity ourselves. We are looking at building new hydro plant and we are also looking at other renewable technologies such as biomass. These are all technologies which have significant opportunity for export overseas.

**CHAIR**—Given the developments in solar power and wind energy, how competitive are they at the present time? I know some people are prepared to pay extra for electricity, but what is the difference in price?

**Mr Oates**—There is a significant difference between coal based prices and particular prices in the market at present which are depressed. You will see in our submission that we have put in a \$60 a tonne of CO<sub>2</sub> price for a permit as a maximum. That represents the difference between the potential of renewable and current prices of electricity generated from coal, which might generate something like one kilogram of CO<sub>2</sub>

per kilowatt hour.

**Dr Lang**—To expand on that, there certainly is a premium to be had in selling green power to customers at the moment. As that market segment grows and as the technology improves, the difference between them is getting smaller all the time.

The renewable plant we are building right at the moment is very much commercially cost effective—there is no question about that. We can sell the output at the price that it cost us to build, so there is no question that there is not a market out there at the moment for these. Also, our subsidiary, Pacific Solar, is working very substantially on a five-year program that aims to reduce the cost of solar PV down to something like the cost of a normal grid connected supply to a household. If that can be achieved, then the whole question of whether or not people will pay a premium for green energy disappears.

**Mr Flanagan**—I would like to clarify the figure of \$60 per tonne. We are not saying that permits should cost \$60 a tonne; we are saying that, if you are naughty and you emit CO<sub>2</sub> without a permit, you should be charged the \$60. In that way it takes away the incentive to cheat.

**CHAIR**—You mentioned here and said in your submission that you think an emissions trading system should be set up as quickly as possible. There would seem to be a mild disagreement with Mr Orchison in that respect.

**Dr Lang**—I think there is an opportunity for the electricity industry to be first for the reasons given earlier by the New South Wales government, that is, that it is relatively straightforward and it can be implemented reasonably quickly in the current electricity market arrangements. The mechanisms and the costs, therefore, of having emissions trading—in terms of administration—would be quite low. We are one of the largest emitters and we perhaps have the most potential at this stage for emissions trading to make a difference. I do not see any great need for a delay in having that happen. The opportunity is there to start with an initial scheme that works. It perhaps would not have all the bells and whistles or necessarily cover every single source and sink you can think of, but at least get something operational and expand it quickly, pretty well like the New South Wales government suggested as a pilot scheme.

**CHAIR**—I do not know whether I have caught up on the New South Wales pilot scheme. Is it similar to what we were discussing earlier?

**Dr Lang**—Yes, it is.

**CHAIR**—Could you elaborate on that?

**Dr Lang**—There is no real proposal at this point, other than that they suggested the electricity industry would be a good pilot if one was going to be done. I suppose the New South Wales government's position on that is that they would see it to be more of a national opportunity than a state based one.

**CHAIR**—I take it you would like to get your permits for nothing, though?

**Dr Lang**—No, we believe that the allocation should be done so that you create a market driver. I agree with the comments that were made earlier that, unless some amount of them are auctioned off, you do not create a market. There needs to be that driver, but it may only be perhaps 10 per cent of the total rights that are available. If the other 90 per cent are allocated in some equitable fashion, you are not penalising the existing players out of existence, but you are also giving them very strong market drivers to respond.

**Mr EOIN CAMERON**—How do you go about flogging off your green power? Who do you flog it to? How do they know about it? How much are they paying for it?

**Dr Lang**—I think I can answer two of those three questions. The one I cannot answer is how much they are paying for it. The answer to the first question is that the retailers of New South Wales have an incentive on them, because of licence conditions in New South Wales, to buy a certain percentage of their total energy from generators who can supply green industry. That creates the market, if you like. It also creates an incentive for them to want to sell it to their customers by creating their own green power schemes within their franchise areas. So they come to us: we are one of the few current players who have renewable energy. We negotiate a price that at this stage is certainly above the current market rates for electricity. They get an advantage out of it because they on-sell it to their customers, and we get an advantage out of it because it encourages us to go ahead and do the feasibility studies for new renewable plants.

**Mr EOIN CAMERON**—Do you have a rough idea, in percentage terms, how much it would be above a standard electricity bill?

**Dr Lang**—I am probably not at liberty to say in terms of commercial in confidence, but it certainly makes it worthwhile for us to investigate these studies.

**CHAIR**—It was on the ABC the other day.

**Dr Lang**—Then you will be able to get a copy of it.

**Mr BILLSON**—Your enthusiasm for start up of a trading scheme: is that born out of your comments just a few moments ago that you are one of the few players that has renewable energy as part of your business base?

**Dr Lang**—Certainly Pacific Power sees some advantages in this for us as an organisation. We also believe that it is something that the industry as a whole can respond to, not only because of renewable energy—that is just one aspect. Sequestration is another, and we have certainly done some work on that. There are, I think, lots of opportunities for all the industry to take this on board and get some value of out it.

**Mr BILLSON**—With regard to sequestration, what spread of activities are you involved with or looking at?

**Dr Lang**—Again, perhaps Lindsay can expand on it very broadly. We have been working with state forests in New South Wales, jointly developing the issues involved in sequestration and how that would be utilised in the electricity industry.

**Mr Oates**—It is early days at this time with sequestration because, as you are probably aware, there is a whole raft of issues to be resolved. In particular we are looking at facilitating the development of native hardwood forests in addition to the utilisation of softwood plantations. We are working towards eventually clarifying a mechanism for trading the sequestration benefits.

**Mr BILLSON**—Going the full cycle, though, once you have made that plantation you have the trend in science of maximising your carbon sink value. Would you then time your harvesting to when you hoped you would have some surplus on your credits for electricity production? Is that broadly the concept?

**Mr Oates**—Sequestration is interesting because if you take a tree, you grow it and you cut it down eventually the carbon that was sequestered is going to find its way back into the atmosphere, whether it is burnt or whatever.

**Mr BILLSON**—That is my point.

**Mr Oates**—The way we look at it is quite simple. You take a hectare of area and you plant a forest on it. That forest has a certain carbon content over a period of time. As the trees grow you get a rapid take-up. The trees can be thinned and it reduces. At the same time, you are building the leaf litter and the ground build-up of carbon. But you can say that, over a period of time, that hectare will sequester so many tonnes of carbon. Very simply, if I emit a tonne of carbon today I need to go out and buy a hectare of forest, whether it has yet to be grown or will start being grown next year, and that has to be maintained as a hectare of forest in perpetuity.

**Mr BILLSON**—Sure, but the reverse applies when you harvest it.

**Mr Oates**—When it is harvested, that forest can only be sold once for so many tonnes of carbon. That hectare has to be retained as forest in perpetuity if you are going to lock up the carbon in perpetuity. That is one of the issues.

**Dr Lang**—You simply replant it. As long as you keep that forest continually as a forest you can harvest it as many times as you like and it always sequesters the same amount of carbon.

**Mr BILLSON**—Unless I am mistaken, does not the Kyoto Protocol anticipate that you need a permit to harvest but if a wildfire happens to go through you do not need a permit?

**Mr Oates**—If you regrow the forest, on average, over its period of life, it will—

**Mr BILLSON**—I understand the logic. I am just saying that the mechanics that are being broadly foreshadowed under the lead-up to Buenos Aires present some difficulties for the logic.

**Mr Oates**—That is certainly one of the issues to be resolved.

**Mr Flanagan**—One of the key points there is that, conceptually, one can fall for the trap of thinking that a forest is sequestering greenhouse gases year in and year out. Whilst that is true, you only get to count

them once, otherwise you run into all the traps that you mentioned.

There is something else on sequestration that we are doing that may be of interest. We are co-funding, along with the Commonwealth government, some research work being done by the University of Western Sydney, which is looking at the capacity to sequester greenhouse gases in grassland in northern Australia. Apparently there are large areas of grassland which have deteriorated over the years in northern Australia, and that is also believed to have considerable potential for sequestration. This project is looking at measuring the capacity of this. One of the adjuncts to doing the project will be an understanding of how it works and, hopefully, the capacity also to measure the amount of sequestration you get from that kind of activity.

**Mr BILLSON**—It is a re-imaging of woody weeds. It is the only good thing anyone has ever been able to find about them. Under your logic also, the capacity to bank credits seems very important, particularly over the life cycle of some of your ideas. Is that something you would anticipate would be easily accommodated within a trading model? Can you talk about how you see credits being carried through different accounting periods and the like?

**Dr Lang**—Again, this is a proposal. It is not meant to be definitive.

**Mr BILLSON**—We are all just chewing the fat here at the moment.

**Dr Lang**—Certainly a bankable scheme is practical. The way we see it working is that a certain right to emit a tonne of CO<sub>2</sub> or whatever quantity you like would have a certain start date—so it would apply from 1 July 1999 or some particular date—and it would be bankable in that it could be used for any subsequent year from that year onwards.

**Mr BILLSON**—Within that accounting period or beyond that accounting period?

**Dr Lang**—Beyond the one-year accounting period. Every year you would simply release a lower amount of emission rights, so you would slowly come to your target. But if, for example, in one particular year you were under but you felt the next year you were going to be over or some such thing, you would be able to bank them. The reality is you would still achieve the target no matter what the temporal difference.

**Mr BILLSON**—But if we were to suggest that sort of scheme and we had that discounting of your permit entitlement, surely you would have to discount the bank values as well, otherwise your option would be just to clock them up this year while they have their full value and then, two accounting periods down the track when you might have pruned 15 per cent off them, you have got a full value bank credit. Would you imagine there would be discounting of the banking value along the same path as your permit?

**Dr Lang**—Rather than discount the value of a right from one tonne to 0.9 tonnes or something, change the total number of new rights released so that this year, if there were X thousand rights available, next year there would be 90 per cent of that number.

**Mr BILLSON**—So you would imagine eating into that new entitlement?

**Dr Lang**—That is correct.

**Mr MOSSFIELD**—We were talking about the pilot scheme for greenhouse gas emission trading. Should a greenhouse gas emission trading scheme be introduced only in the energy market? If not, do you have any views on what other emitters could be included?

**Dr Lang**—I think there is value in starting small and building, but you need to build fairly rapidly. There is certainly a big disadvantage in not extending it to other major emitters over time if for no other reason, for example, than you would perhaps get inappropriate drivers on people shifting out of one industry sector into another just because that one did not happen to fall under the emissions trading regime. You do need to move quickly into those other areas and cover as much ground as possible. Not only is that equitable but it is also the least cost answer. It means that some other sectors, where there may well be cheaper ways of reducing emissions, would not be captured if you did not extend it to include those.

**Mr MOSSFIELD**—What other sectors would you see moving into as a priority?

**Dr Lang**—The main ones would certainly be the electricity and transport sectors—I think they are very important—then moving into other major industries over time. Obviously gas needs to be included if for no other reason than the fuel substitution potential between gas and electricity. It is one of those areas that needs to be very carefully looked at. It needs to be decided on a case by case basis who should be introduced first, who should be introduced next and then how quickly you expand.

**Mr McDOUGALL**—I am very curious about your statement about export industries being quarantined from domestic emission trading, to wit obviously based on the international market. Can you expand a little bit more on how long you see export industries being exempted? Really that is a tax advantage or an advantage to the export industry, is it not?

**Dr Lang**—Perhaps some of the others could expand further. I suppose the intent is simply to see that as a balancing point. You could apply it to every single player on day one, but if that created a challenge that would otherwise delay the introduction of the scheme then perhaps that should be something that you would bring in as the second priority. We do not necessarily have a view on how long you should quarantine them for or on what basis. That is a consideration that will need to be taken into account.

**Mr Flanagan**—In the scheme that we have outlined, which, as Robert said, is indicative, we have suggested that one option is to quarantine, say, the emissions of large energy intensive exporters until 2008, when the Kyoto agreement starts to bite. I notice it has been suggested in one of the other submissions you have received that certain allowances for exporters be made until such time as international trading becomes a reality, in which case that would create an international level playing field. The main thing we are saying at this stage is that it is a principle that we have to take account of and it should not be a reason for delaying doing the things that we can do.

**Mr McDOUGALL**—Are you talking about raw material exporters or are you talking about manufactured goods exporters?

**Mr Flanagan**—Aluminium is probably a particular example. There is a lot of electricity content in aluminium. If an aluminium producer suffers a cost disadvantage, because of the cost of the emission credits which flow through the system into his operation, it may make him less competitive internationally. We are saying that has to be taken into account, particularly in the early stages of the scheme, in order to enable us to get the scheme off the ground.

**Mr McDOUGALL**—We heard from ESAA just a moment ago that they believed we could meet those targets that have been set. Have you looked at the credits and what impact they would have on meeting by 2010 those targets that have been set?

**Mr Oates**—Those credits are only in the intervening period. By 2010 they would not apply because we would then have full blown international trading. Quarantining the export industries is only a temporary measure until international trading arrangements get to set up. The objective is not to disadvantage the export industries.

**Mr McDOUGALL**—Coming back to your opening comments, Dr Lang, you said you were a black coal energy electricity producer. What percentage are your renewable green energies, at the moment, of your total production?

**Dr Lang**—At this stage it is very low: less than one per cent. We have about 330 megawatts of hydro plant and we have 2,640 megawatts of coal fired power plant. We are growing our renewable end of the spectrum but it is one of those things that take time. I suppose that is one of the reasons why, and it is the same for any player, you cannot build such plant overnight. There is a multiple year time frame to build any sort of power stations in Australia. Therefore, we see a need to introduce targets in a slow fashion and increase the reduction year by year as time goes by. In fact, in the back of our submission there is a graph of a suggested scheme where you could slowly introduce emissions reductions over time and allow people the time they need to build new renewable plants, if that is what they see as the lowest cost way of achieving targets, and not impose an unrealistic target on them on day one.

**Mr McDOUGALL**—What is the percentage you are looking at by 2010 of your total energy production being in renewable energies?

**Dr Lang**—Being in the competitive energy market, the answer to that is very simple: as much as we can sell.

**Mr McDOUGALL**—Be realistic. What are you looking at? You would have set yourselves a target.

**Dr Lang**—We have about a dozen projects in feasibility at the moment and I think it would be premature to say which ones of those dozens will get up. We are hopeful that many of them will, but it is very much subject to us finding customers willing to buy the output.

**Mr McDOUGALL**—You said earlier that it was economically viable for you to do it.

**Dr Lang**—Yes.

**Mr McDOUGALL**—What I am trying to find out is how much of our energy production is going to be in renewable energies by 2010? Are we looking at two per cent or five per cent? What are we really looking at?

**Dr Lang**—As ESAA said, two per cent is not an unreasonable target. It could certainly be achieved. In talking about New South Wales alone, already five per cent of the energy supplied to New South Wales at this point in time is hydro from the Snowy Mountains scheme. Even though the Snowy scheme will not be increasing in size over the next 10 or 15 years, certainly other renewable projects will get up there. Renewable plant will become a decent percentage of the total energy mix.

**Mr McDOUGALL**—Of your one per cent, obviously hydro is the biggest proportion of it but there is an anti-damming policy in this country. I am not saying that is a government policy or anything; I am just saying that nobody wants to build dams. I cannot remember when the last one was built but there is one being built in Queensland at the moment. One would think that as our energy consumption goes up, which it is going to do, hydro is going to become a lesser percentage of that energy use.

I am still trying to find this two per cent in renewable energies. I am a real layman in this game. I do not know anything about producing energy, but from what I have seen around the place there is not a hell of a lot in solar and there is not a hell of a lot in wind. We are looking at thermal. We do not know where that is at this stage. It is nice to set targets but are they realistic?

**Mr Flanagan**—The two per cent additional renewables in the Prime Minister's statement in November, for the very reasons that you have articulated—the hydro is not really going to grow significantly—is a very challenging target. It is a target which we support because without challenging targets we do not achieve. It is an appropriate target, it is a challenging target. In the submission from ESAA they indicated, in terms of megawatts, what that might mean.

We should also not overlook the potential for natural gas to reduce the greenhouse gas intensity. We tend to think coal over here, renewables over there. But natural gas is also a very viable transitional technology, if one can perhaps coin a phrase, between the coal technology and the renewables technology. We currently have a project that we are developing in the Wollongong area for something in the order of 350 megawatts of combined cycle gas turbine plant and another project in the Wagga area for approximately 100 megawatts. These are significant blocks of generation which we believe mean significant reductions in greenhouse gas intensity. They are not renewable but they are the sorts of things which will play a very significant role in enabling us to actually meet our targets.

**CHAIR**—Most of our gas is on the wrong side of the country.

**Dr Lang**—If I could just answer one more part of your question, Mr McDougall, the question about dams. You are absolutely right. There is certainly, on our part at least, no intention to build any new dams. What we see is the opportunity of putting hydro plants on existing dams wherever they are located—and there are quite a few of those around, but a limited number. Once all of those cost effectively are resourced, then you move on to the other technologies that can be done. Lindsay Oates mentioned earlier the wind power potential in Australia. It is enormous. Many thousands of megawatts of wind generators could



potentially be put in New South Wales, Victoria and South Australia alone. We have been doing wind monitoring in the south-eastern states of Australia for the last five or six years and have already identified a number of areas where you could do some work on that.

Another big one is biomass. In fact, biomass is said by a number of people to be the biggest possible renewable energy resource that is yet untapped. That could be in terms of some of the sugarcane, cotton waste and so on or other products such as forestry thinnings and so on. So that is certainly an area. There is plenty of scope for those sorts of things to be developed through. The problem we have at the moment is that the green energy market is only very much in its early phases but it is growing. We can only grow as fast as the customer base, effectively, but we believe that is an area that is certainly going to expand.

The other thing I will just mention is the scale of CO<sub>2</sub> emissions. If I can put it in your minds that if you said that brown coal generation had CO<sub>2</sub> emissions equal to 100 per cent—to give you a starting point—then black coal generation is about 70 per cent, combined cycle gas turbines about 30 per cent and renewables zero. That gives you a lot of scope for emissions reductions just by fuel switching between the various types of plant.

**Mr JENKINS**—Just before going to a question about your allocation of permits, is there anything that is an impediment as a result of the distribution grid not being sufficient? Can we get improvements in efficiencies by enlarging the distribution group?

**Dr Lang**—I think the short answer at this point is that that is not the limiting factor. Co-generation opportunities certainly provide some potential for those sorts of plants to get off the ground because some remote area of the grid is not serviced by an enormous amount of transmission lines and putting a plant out there makes economic sense for those people. That certainly is an opportunity that should be developed. But what you have really got to compare is the advantage of putting that plant there compared to increasing the infrastructure in some way. That trade-off needs to be looked at on a case by case basis. I do not think at this stage in general that is the driving force behind stopping particular generation plants going forward.

**Mr JENKINS**—Thanks for that. In your suggestion as to how you would allocate permits you say that they should be allocated proportionally based on the average annual emissions from 1990 to 1997. Is there a concern that, in a way, you then reward the historically most inefficient because it is easier for those who are less inefficient to get the efficiencies?

**Dr Lang**—Again, perhaps my colleagues can expand on this one, but I think the motivation behind that is pretty straightforward, that is, if you pick any particular year you get various distortions. A particular year may or may not have had a certain amount of renewable plant—perhaps it was suddenly built that year—and will give you a base that is a bit affected. Also, if you set the date too early the other complication is that any new plant that has been built since that early date may have been left out of the initial allocation. How do you deal with those? By averaging it over a range of years and taking into account that, if new plant came in, it may only have been in for one of those seven years or some such thing, you can get a more reasonable average as a starting point. It is simply a basis for allocating out in an equitable fashion that does not distort the field too much.

**Mr Oates**—In terms of rewarding those who do not generate efficiency, I do not think that is necessarily the case. We have got a very competitive market at present; everyone is attempting to generate as efficiently as possible, and that means they have as low carbon dioxide emissions as possible. As for allocating emission credits to start off with, you have got to start from where you are. You cannot say to a particular organisation, ‘Look, you have done the wrong thing,’ because up until now no-one has said it is the wrong thing—it has just been an acceptable method of generation. We have got to start from where we are.

The idea of taking over a five-year period is to be equitable. If you have had a plant out of service in the last year for a major maintenance, why should you be allocated lower credits if the credits were taken over the last year? By taking a five-year period it gives a fair and representable indication of the emissions from that plant.

**Mr Flanagan**—Also, on the equity question we should not lose sight of the fact that the whole aim of emissions trading is to get people to reduce the greenhouse gas intensity of their generation. In a sense, if somebody who has, perhaps, been a polluter in the past cleans his act up and makes a bit of a profit, I think the system is working.

I should also say that, under the scheme we have proposed, because of the way the scheme works, you get to use a permit once. You have a piece of paper that gives you the right to emit a tonne of carbon dioxide or its equivalent. Each year, for every tonne you emit, you have to be able to produce that piece of paper. Once you have used it once it is used. It is gone. You cannot use it again next year. So, a person who has been a polluter receives credits, cleans up his act and makes a little bit of money by selling the credits he did not need to use. Once that is done it is gone. Next year he is on the same footing as the people who cleaned up their act the year before the scheme started. There is a driver there, but it is not over the top.

**Mr MOSSFIELD**—I have a question about the potential for a wind farm. Could you compare the power generated by a wind farm to that generated by a conventional power station?

**Dr Lang**—I think Lindsay could answer that one.

**Mr Oates**—All renewable energies typically operate at about a 20 to 25 per cent capacity factor. A coal fired power station running base load—basically running flat out all the time—would run at around the 70, 75 per cent capacity factor. With renewables you do need to install more nameplate capacity to produce the same quantity of energy over a year.

**Mr BILLSON**—The transportation of energy where we have conceivably Western Australia powering the nation, to coin a phrase—

**CHAIR**—They would love to hear that.

**Mr BILLSON**—That is right. From a Victorian I am happy to say that. If we give you Malthouse you can give us some energy. What is happening there in terms of maintaining the energy value over transportation distances like from Western Australia to the eastern seaboard? Are photovoltaics the way to go? I ask that on two levels: firstly, the gas; and, secondly, it is my view, and it might be an ill-informed

view, that the tidal power capacity in the west represents quite an exciting prospect for the future but then we have to get it to market. Can you talk about what you guys have seen or what is happening in the industry in that respect?

**Dr Lang**—Very briefly, the issue at the moment with WA is that it is not currently connected with the rest of the states, the south-eastern states of Australia, in terms of the electricity grid. At this stage it probably seems uneconomic that that will happen in the foreseeable future. It is a very long way across the Nullarbor and the losses would be horrendous. It does not seem likely that we will be able to utilise the very good tidal power that there is available.

**Mr BILLSON**—Just on that point, you are saying we are not making ground on the losses?

**Dr Lang**—No. The other states, including Tasmania, currently have a proposal for Basslink to connect. Queensland, of course, the son of Eastlink, Westlink, Northlink, whatever you want to call it, is also happening. South Australia is already connected but there is a further interconnection between New South Wales and South Australia called Riverlink which is being put forward at this point. All of those proposals make sense from an electricity market viewpoint and hence they make emissions trading in any of those states very easy to do. It does not preclude, however, Western Australia from being involved in emissions trading. The reason is that you can buy credits or sinks in Western Australia and still make them count here. You do not have to be connected for that to happen.

**Mr BILLSON**—Yes. I was thinking more about the alternative energy potential in the west and it servicing the Pacific side of it and how we would marry those two up. The storage and transportation of the energy value seems to be a problem we are not making a whole lot of progress on and it sounds like you have just confirmed that.

**CHAIR**—You are better off selling it to Indonesia.

**Dr Lang**—I think the technology is the selling point. You could sell it to WA. If solar cells make sense in Sydney they make sense in Perth. If that technology can be made at the right cost then that is a very effective way to have renewables wherever you want to put them.

**Mr BILLSON**—But, going the other way, if tidal power or shift from coal to gas makes sense but you have this location problem, transportation is a big issue. The connection might be to farm it over to South Africa or something as the longer term plan. I am just seeing there is an opportunity we are missing because of a technological dilemma in transporting it.

**Dr Lang**—That is true. There are always improvements to be made in technology, but I do not think that is going to extend to making WA a cost-effective interconnected state at this stage.

**Mr McDOUGALL**—Could I follow up on that question? There is another consortium at the moment talking about running from the North West Shelf a gas pipeline down this Melbourne to Darwin railway line. In your opinion, is that a feasible operation?

**Mr Oates**—There have been numerous studies conducted by the Australian Gas Association of bringing the gas from north-west Australia to the eastern states.

**Mr McDOUGALL**—By pipeline?

**Mr Oates**—Yes, by pipeline. Basically, I think it was about twice the price that we have at present by the time the gas arrived here. In the future that may be quite an acceptable price. But the route down the railway could be a potential route.

**CHAIR**—If Australia went ahead and set up a market in tradeable rights and the rest of the world decided they were not going to go down that track, would that put you then at a competitive disadvantage or not?

**Mr Oates**—The scheme that has been proposed in our submission is based on starting early and having a very long lead time. You will notice that we have that like a tee shot with a golf ball where it rises and the actual emission levels finally drop. In the initial years it could be, first of all, a paper trading scheme to start off with. It then could be traded. We have suggested 90 per cent of emissions are free then 10 per cent are auctioned. It may be that 95 per cent of emissions are free and five per cent are auctioned. The other issue that is controllable is how quickly that cap is reduced. So in the initial period of two, three, four or five years, the impact on Australian industry would not be particularly large. By going ahead in advance of international trading it would be very unlikely to significantly disadvantage Australia.

**Mr Flanagan**—One of the interesting observations that one can make is on the views that are being taken in other places about the prospect of the international trading. For example, John Browne, chief executive officer of BP, in a speech in England in February announced that BP was going it alone. They are in fact now in the process of establishing an emissions trading scheme within BP. One of the advantages he suggested for that is that it will position them better to influence the establishment of international trading when it happens and then to give them competitive advantage in that world.

There are a number of electricity producers in the United Kingdom at the present time who, through the Electricity Generation Association, are working on emissions trading. There are a number of trades which have already happened in North America. I think the leaders are already saying it is going to happen and they are moving on. This is one of the reasons why we say that Australia needs to be in it too.

**Dr Lang**—Just to expand on that, if I may. There is a bill currently advocating domestic emissions trading before the US Congress. There is also a British Energy Industry Association that is drawing up a proposed scheme for that country. UNCTAD, which is the conference on trade and development, is meeting this month in London and predicting formalised international trading as early as 2000. In other words, it is happening.

**CHAIR**—Yes, I know the Americans are keen. Could I go back to my incentives which I was discussing earlier with the previous group. I am a great believer in incentives, probably from my commercial experience. One of the best incentives for change is if you do not have enough money to write out a cheque. In this whole tradeable rights scheme, do you think there would be some merit in reserving some of the

permits for those who achieve the best and giving it to them as bonuses; it is a property right given as a bonus for achieving above the standard set?

**Dr Lang**—In the base of the initial allocation, whatever that amount is, there is all sorts of potential for varying how you might allocate them. Certainly there is scope for that sort of thing to be put in. However, I do not know if it is actually necessary. I think people have their own commercial self-interest at heart here and they will do that anyway because they will save money, so you do not need to give them an extra incentive.

**Mr BILLSON**—On that same theme, how that permit system lands on different sized entities is something I find quite curious to think about. When you get past the big players and you start getting into individual behaviour, how do you reward it and how do you send a signal that something is not going the way it should? How do you see that working out in the structure you are advocating? For instance, take the primary producer. They are all very keen to be gaining the benefits of sequestration for their property but not so keen to have their Herefords tagged as an emitter. Do you go to the cattle association and encourage them to acquire permits for their entire herd? Do the credits go back to the National Farmers Federation? How do you be consistent?

**CHAIR**—It might be a low flatulence herd.

**Mr BILLSON**—It could be, or it might be a diet related thing which might be a great initiative to save the globe. How do you see that landing consistently where the incentives flow through to the individual but also some of the responsibilities register in individual behaviour minds?

**Dr Lang**—I understand the question, and I think it might be one we will answer more broadly. My first reaction is that emissions trading is not the only way that you can achieve reductions. That is a good market based mechanism. You might also need to use regulatory mechanisms such as a two per cent renewable target or what have you. You might also need to use voluntary schemes such as the greenhouse challenge. It is the combination of all those effects that will get you to a certain result and it may well be better for one particular industry segment or another to be hit differently.

**Mr BILLSON**—If you had some livestock diet measure—we might be getting into an area of too much information here—where there were some gains made, that might be a bonus back to the industry that they used to promote the industry, as distinct from particular owners of herd.

**CHAIR**—The mind boggles.

**Mr BILLSON**—I am trying to live it a little here without getting too far into it.

**Mr Flanagan**—One of the principles here is that the cost of an emissions trading scheme has to be low relative to the size of the scheme, otherwise it will strangle itself. In our submission we suggested a figure of 100,000 tonnes of CO<sub>2</sub> per year as a threshold. Whether that is the right number or not and whether that might change with time is not something that we are in a position to judge. But the principle should be that you capture what you can efficiently. If it is not efficient to capture it, do not worry about it; do not let

the system bog down because of a problem that may not be important in the overall scheme of things.

**Mr BILLSON**—You would come in with other policy tools to deal with those.

**Mr Flanagan**—Yes. In a sense, if we can go back to the renewables, the Commonwealth has mandated an additional two per cent of renewables. That is something which could live quite comfortably with emissions trading. Those two initiatives would work together to deliver an outcome. There are probably many other examples of things which need an additional driver beyond market forces.

**CHAIR**—I think we might be all out of hot air, greenhouse gas. Thank you very much for attending. It is proposed to take Pacific Power's handout, *Arrangements for Trading in Greenhouse Gases*, as exhibit No. 3. There being no objection, it is so ordered.

**Proceedings suspended from 12.12 p.m. to 1.17 p.m.**

**CUSACK, Mr Lester David, Chairman, CIF Greenhouse Gas Working Group, Cement Industry Federation, c/- Australian Cement Holdings, Railton, Tasmania 7305**

**CHAIR**—I welcome you to the hearing. We have received a submission from you and have authorised its publication. Do you wish to add or change anything in that submission?

**Mr Cusack**—No.

**CHAIR**—Would you like to give a brief statement before we ask questions?

**Mr Cusack**—I will add a few comments to put the industry in perspective which were not attached to the submission. There is a small brochure which may or may not have made its way into your hands. The industry in Australia comprises five major companies: Adelaide Brighton Cement Ltd, Australian Cement Holdings, Blue Circle Southern Cement, Cockburn Cement and Queensland Cement, with total sales of about \$1 billion, of which the EBIT is in the order of \$150 million to \$200 million. It is a totally domestic industry. There are almost no imports and almost no exports. We manufacture around seven million tonnes of cement per annum. It is a regionally based industry. The nature of the industry is such that it requires a large limestone ore resource and therefore the plants occur wherever those limestone reserves are, for example, Gladstone, in Tasmania, Berrima.

The sources of emissions from this industry are twofold. Firstly, there is what is referred to as a calcination emission. This is a chemical process emission which emits CO<sub>2</sub>. It is a fundamental process in making cement that you need to emit CO<sub>2</sub>. For every one tonne of cement that is made there is about half a tonne of CO<sub>2</sub> emitted into the atmosphere from this chemical reaction alone. On top of that there is a fuel emission which can vary, depending on the nature of the plant, between 0.3 or 0.4 tonnes per tonne of cement. In sum, for every seven million tonnes that we make in this country per annum, we are emitting in the order of 6½ million tonnes or thereabouts of CO<sub>2</sub> into the atmosphere.

In the last decade or so the industry has undertaken a very comprehensive and substantial reinvestment program. All companies have been involved. A lot of old and inefficient plant has been retired and we have reached the point where the energy efficiency of the industry has approached the theoretical minimum. An emissions trading scheme in respect of that theoretical minimum would not make any difference. You either can or cannot make cement with the processes that are available.

Looking at the commercial environment in which this industry is currently placed, there are a number of factors worthy of mention: declining real prices over the last several years, comprehensive rationalisation, the current Asian surplus of some seven times the Australian capacity, and much cheaper international shipping which brings the prospect of cement imports into this country much closer.

If we were to put a value on an emission permit in the order of, let us say, \$10 per tonne of CO<sub>2</sub>, that would wipe out about 30 per cent of the EBIT of the whole industry. From our point of view, a domestic emissions trading scheme would be a commercial disaster; that is, a domestic scheme that applied to Australia alone which did not impact on the neighbouring countries which are able to export into Australia,

for example, Indonesia, Thailand, Taiwan and like countries.

Our concerns in respect of emissions trading I have noted in the submission and I will list them briefly: the allocation of initial rights; the allocation of targets; the cost of permits; and the impact of those three points on competitiveness in the industry. That concludes my introductory remarks.

**CHAIR**—Thank you, Mr Cusack. What is the extent of the Australian cement industry in production terms?

**Mr Cusack**—It is seven million tonnes which is the entire cement demand of this country. There are very small quantities of cement imported. They are largely specialty cements that come from other countries but they are in the order of thousands of tonnes rather than millions of tonnes.

**CHAIR**—If, in effect, there was a tradeable system set up, and there would have to be certain measurements to measure what was being emitted, would your industry be in a position to measure those emissions and would that be a cost to the industry of a magnitude that you could not bear?

**Mr Cusack**—Yes and no. Yes, it is easy to measure the emissions. We can use readily available tonnage figures which are used as part of the normal process of the industry—readily available chemical data—to generate the numbers. The quantity of CO<sub>2</sub> emitted would not be a very difficult exercise, it would be a simple accounting exercise almost.

**CHAIR**—You mentioned that, if there was not an international tradeable system in place, you could see fairly big problems for the Australian industry. I daresay you mean that people could import cheaper product into this country?

**Mr Cusack**—Very much so, yes. We are facing great difficulties at the moment because the Asian areas are awash with excess cement. With an emission trading scheme that, let us say, put up the cost by \$10 per tonne of CO<sub>2</sub> emitted, it would be very difficult for the industry to withstand imports into this country. To that extent the emissions from the industry would not decrease at all; they would simply be relocated from this country to Indonesia or Thailand or wherever else.

**Mr BILLSON**—Can you walk us through that calcination process and contrast emissions that are generated in the production of cement product as distinct from emissions generated through the drying processes? Would your concerns about Asian imports be overcome if they also were faced with responsibilities under Kyoto, and therefore, how significant would their impact be? Can you explain the different steps of production and what can legitimately be done offshore, as distinct from the laying of cement in Australia and the emissions that come about through that exercise?

**Mr Cusack**—The production of cement requires limestone, and limestone is calcium carbonate. The raw material for limestone contains in the order of 80 per cent calcium carbonate prior to processing. That is inevitable. Cement cannot be made without that. To convert that material into the final cement, it has to be heated to a high temperature. In that heating, CO<sub>2</sub> from the calcium carbonate is emitted—half a tonne of CO<sub>2</sub> per tonne of cement—and in reaching that heat there are further emissions, roughly in the order of 0.3 to



0.4 per cent, from the burning of coal, oil or gas. All of the emissions occur at the point where cement is manufactured. It is not possible to do half of it in one place and half in another; it is all done in the one plant. Wherever the cement is, once it arrives at the building site or the batch plant, that cement is mixed with water, aggregates and the like, and the level of emissions from that process is almost negligible.

**Mr BILLSON**—So the point where it becomes that light, fine product, bagged or ready for preparation into concrete, is where all the emissions are.

**Mr Cusack**—That is correct.

**Mr BILLSON**—And all of that activity would be done offshore and there would be the importation of the bagged product.

**Mr Cusack**—That is right.

**Mr BILLSON**—I just want to be clear in my own mind at which stage one stopped and the domestic activity would start.

**Mr JENKINS**—What mechanisms are there to make that process more efficient—that is, reduce the CO<sub>2</sub> emissions? It is actually part of the chemical, so is it by fixing the CO<sub>2</sub>?

**Mr Cusack**—In respect of the chemical emissions, there is nothing that can be done. There is no way to make cement without emitting CO<sub>2</sub>. With any cement process anywhere in the world, the number is almost identical. One of the things that can be done and has been done is to improve the fuel efficiency of attaining the temperatures that make cement. If I go back a couple of decades, cement was made using what was called a wet process where everything was initially put together, assembled, ground and fed into the heat operation in a wet form. That technology is now outdated and there is now a dry technology which consumes far less heat. It is in that area that substantial efficiency improvements have been made. The dry process consumes about half of the heat; in other words, half of the coal, gas or oil, that the wet process did. That is one area.

It is possible, in the utilisation of cement in the final product, to utilise waste materials from other industries, particularly from the steel or iron industries and from power stations that burn coal. It is possible to use fly-ash from coal fired power stations and slag from blast furnaces as substitutes for cement. There are technical limits to that in the order of 15 to 20 per cent. By and large this country has got very close to those technical limits in the utilisation of waste material.

**Mr JENKINS**—In your submission you have analysed the approximate source of the emissions as 49 per cent from the calcination, 38 per cent from the firing of fuel such as gas or coal and the remaining 13 per cent from indirect emissions from electricity generation.

**Mr Cusack**—That is right.

**Mr JENKINS**—When the industry makes the claims that it is on track to reach levels and everything,

does it include any variations in the 13 per cent from indirect emissions?

**Mr Cusack**—They are included but they will not change a great deal. The 13 per cent is tied up with electric drives. It is a fact that, as the industry adopts more efficient processes, its use of electricity increases slightly, but that number is not anticipated to change a great deal. It may increase, but only by a small amount—about one per cent, from 13 to 14 per cent or that sort of order.

**Mr JENKINS**—Should you be held responsible for the changes of that aspect?

**Mr Cusack**—To the extent that we use it, yes, but to the extent that by using electricity we enable other more efficient processes to be run, no.

**Mr JENKINS**—The main changes will be in the firing?

**Mr Cusack**—The main changes will be in the firing and in the utilisation of waste materials instead of cement.

**Mr JENKINS**—Are you based in Tasmania?

**Mr Cusack**—Yes, I am based in Tasmania.

**Mr JENKINS**—Are you better placed in overall emissions, against other members of the Cement Industry Federation, because you use predominantly hydro power?

**Mr Cusack**—Yes, to that extent we are better placed to meet a particular target than others in the mainland states. I am not here to argue a case for a particular company.

**Mr JENKINS**—No, I am trying to get around—

**CHAIR**—It raises a very interesting point because it is taking back to the generator the energy you are using and the emissions they are putting out into the atmosphere. I wonder whether you should get some credit for what they are doing as to getting the improvement in emissions as well—because you are buying the electricity and you are actually part of the process.

**Mr Cusack**—Yes, we are. We have not thought a great deal about whether we need to be part of the electricity generating process. We are a consumer like anyone else and, if there are improvements or duties in that area, our thinking has been that it is up to the electricity generators to solve those problems. Electricity costs, whilst they are important, are not the biggest part of our manufacturing costs. There is not a lot we can do about them apart from increasing the consumption a little bit to enable utilisation of other technology.

**CHAIR**—You cannot do much about calcium carbonate, can you?

**Mr Cusack**—No, nothing at all.

**Mr JENKINS**—I have to apologise to Mr Cusack. He is at the part of my learning curve which was influenced by informal discussions I had over lunch. That was why I was asking those questions.

**Mr BILLSON**—It is good to see it has sunk in.

**Mr JENKINS**—That is right, professor.

**Mr McDOUGALL**—I have to say thank you to the industry for taking the cement manufacturing out of Brisbane and moving it to Gladstone. You improved our air in Brisbane enormously. Because of our demographics it has been a problem for many years.

I understand your process and, therefore, I understand your problem and the answer to the technological question. I suppose it leads me into another area. What are the biggest volume users—let us say the top five volume users—of cement?

**Mr Cusack**—Eighty per cent of our cement goes to what we call the premix industry—familiar names like Boral, Readymix and Pioneer.

**Mr McDOUGALL**—That is the construction industry.

**Mr Cusack**—Yes, it all ends up in construction one way or another. Premix is the familiar way, where you see trucks driving through the city. Other areas of use are for making tiles or for pre-stressed concrete structures—beams and the like—and that is not so readily seen. Out of the 80 per cent that goes into the premix industry, one-third or perhaps more goes into housing slabs, footings or driveways and the like.

**Mr McDOUGALL**—If we were to look at this in a serious way, what you are probably saying to us is that the only way we can significantly reduce CO<sub>2</sub> emissions for the cement industry is to change our methods of construction and make less cement.

**Mr Cusack**—That is one way—or to not use concrete at all and build houses out of timber or steel, should they be effective in the long term. That raises the question of what the most effective material is in the long term. We would contend, based on a life cycle analysis, that one is better using concrete as a construction material. The initial energy expense may be somewhat higher than other materials but in the long term, through energy efficiencies and energy conservation, it is better to use concrete.

**Mr McDOUGALL**—I suppose it poses a question, in relation to conservation, about the use of timber. Cement is used to save our forests, if we want to put it that way, but there is a by-product of cement manufacturing. Which is worse: the cutting down of plantation forests or the making of cement, in relation to outcomes like CO<sub>2</sub> contribution?

**Mr Cusack**—That is a difficult question. Lots of people have done a life cycle analysis and concluded that, in the long term, concrete is a better way to go.

**Mr McDOUGALL**—I have actually gone the other way. I went concrete, timber, concrete, and I am

going back to timber. That is in house construction for myself. Has your industry done any analysis on what the CO<sub>2</sub> emission changes would be if you were to change the construction method to, say, something like they have in the US where it is predominantly steel construction with a bit of a cement casing as opposed to pre-stressed concrete, which it is in Australia and has been for a long time, particularly in big commercial construction?

**Mr Cusack**—Yes. I do not have those figures at my fingertips. Certainly, it is still better from an energy point of view to build with a concrete frame than to build with a steel frame and cladding with bricks or sheeting.

**Mr McDOUGALL**—When you say ‘better’—

**Mr Cusack**—It is better from a life cycle point of view.

**Mr McDOUGALL**—Would you be prepared to give those figures to the committee?

**Mr Cusack**—Yes, they are available.

**Mr McDOUGALL**—That would be of great interest to me, Mr Chairman. I would like to see that.

**Mr BILLSON**—So, Mr Cusack, your thesis is really one that says, ‘We’re at pussy’s bow in terms of improved technology. Cut us some slack with growth projections and move onto something where you can get some genuine benefits.’ Is that it in a nutshell?

**Mr Cusack**—That is it in a nutshell. By 2010, the industry, through further rationalisation and investment, will have got to the point where there is not a more energy efficient way to make cement, so the only way to cut emissions would be to get the cement from somewhere else in the world. That might cut Australia’s emissions, but it will not cut the world’s emissions. As you said, we need the slack to be able to make that cement. Our projections for cement growth through demand and our technological forecasts are such that we will be below the 108 per cent nominal Australian target by 2010.

**Mr BILLSON**—The broader public are going to want to be satisfied—and, no doubt, we, as elected representatives will have to argue—that everyone is making a contribution. That sounds a tough assignment in your area. We heard from the Electricity Generation Association people this morning that they are not quite sure whether they should be the ones making that effort either. We are getting a diminishing pie of players who are looking like having to make a biblical contribution if we are going to meet our goals. Is there an argument that says that, if we allocated permits to your industry as it stands today and discounted those permits over a period of time, we would not see any positive effect and it would simply just add a new cost to your industry?

**Mr Cusack**—That is right. It could only force a retirement of the less efficient parts of the industry. It will not affect emissions.

**Mr BILLSON**—Your earlier advice was that about 15 per cent of the cement product was steel

production slag, and you mentioned one other area.

**Mr Cusack**—Fly-ash from power stations.

**Mr BILLSON**—Embers and the like. What about substitution within your product by products other than those two—say, construction rubble?

**Mr Cusack**—Those sorts of things go on already. The recycling of concrete in the form of aggregates for new concrete and that sort of effort is already happening. Generally, that pace is forced by other considerations, like landfill restrictions in places like Sydney. There are not a large number of other things that can be used. Slag and fly-ash are the ones that are used universally around the world. There are minor quantities of other material, such as silica fume from silicon works, but they are very small quantities and not much is made in Australia.

**Mr BILLSON**—So the distinction you would like us to have clear in our minds is that when you are talking about growth in cement, you are actually talking about a higher rate of growth in terms of concrete because of aggregate additions and substitutions to make that cement go further in terms of final building form. Is that something you would like us to take on board?

**Mr Cusack**—Yes, that is exactly right, for various different reasons: the use of waste materials; concrete technology itself and improvements there; things called chemical admixtures; and improvements in building design, where perhaps lower strength concrete could be used. All those sorts of things mean that we can stretch the cement tonnage to make a greater concrete volume.

**Mr BILLSON**—Just on the same theme, what would be a reasonable expectation of the industry as a way of demonstrating effort towards the national goals? How do you see the industry being a positive contributor in any form? Are there ideas that you think we should factor in through building design which would encourage broader use of other products or concrete with a lower cement content where stress ratings and all that can be met? Are there regulatory driven contributions we could look to outside the emissions trading framework?

**Mr Cusack**—Probably not. The requirements for concrete strength are largely engineering issues, and those standards are established by engineering type people. The area that we, as an industry, have been involved with and promoting for some time is research in the utilisation of these waste materials and research into proper engineering codes. We have been engaged in that type of effort for a couple of decades, and we continue to be engaged in it. In that area, we are positively contributing to the optimal utilisation of cement.

From a public relations point of view, our utilisation of slag and fly-ash is quite high and has been promoted by the industry for a long time, again with research through the CSIRO and the like. In terms of comparing ourselves with overseas practice, we are quite happy for that to be done. We have got a good record on where we have been and where we are going.

**Mr BILLSON**—So the only thing we could do perhaps is discourage the use of concrete vehicular and pedestrian pavements in favour of asphalt or whatever—I am just floating this as a suggestion—which

would put a brake on your growth as distinct from trying to get some carbon savings in any other way. We are really out of options, is that—

**Mr Cusack**—If you were to put a brake on concrete construction surely that would affect the industry, but whether that was the best thing to do for the environment is another matter.

**Mr BILLSON**—I am trying to work with you to come up with some contribution somewhere rather than just say, ‘It is all a bit too hard and we have done all we can. Look somewhere else.’ That is a theme that pops up—

**Mr Cusack**—We are not saying that we have finished everything we have done and we are sitting on our hands from now on. We are not the best that we could be—

**Mr BILLSON**—But you are not far off.

**Mr Cusack**—But by the time the year 2010 comes we will be pretty good.

**Mr MOSSFIELD**—Mr Cusack, in your submission you said that, in respect of the cement industry, there is no need for greenhouse gas emissions trading schemes; however, you are advocating a self-regulation system for approved verification. Some other submissions have followed along a similar line with either the state environmental protection authority or a central federal authority monitoring and verifying emissions. If the emission trading system relied on self-regulation, who should undertake that verification and monitoring?

**Mr Cusack**—I can draw an illustration from what is happening at the moment in a cooperative agreement we have with the Commonwealth in the greenhouse challenge program. As part of that, we have undertaken to have our agreement verified by Coopers & Lybrand. We submit figures to Coopers & Lybrand who then do a paper audit on those figures and provide a report to the Commonwealth. Because of the relative simplicity of measuring and reporting the industry emissions and the ease with which they can be checked by somebody else, it will be a relatively easy exercise for somebody like Coopers & Lybrand to carry that out on behalf of our industry.

**Mr MOSSFIELD**—So you would support an independent authority to carry out that final auditing of the industry?

**Mr Cusack**—That is not a problem in our industry.

**CHAIR**—You may have mentioned this but I did not hear it. Where would you sit in the scale of emitters in the Australian scene? Have you any idea?

**Mr Cusack**—Our total emissions, which are the calcination plus the fuel, are about 1.5 per cent of Australian emissions.

**CHAIR**—In a tradeable rights program where you could trade permits, where do you see the industry having any chance of gaining some credits? In sinks or somewhere like that? Where would your options be in

this tradeable permit system?

**Mr Cusack**—Are you saying if we had a ceiling on emissions and we had to go and source credits, where would we do that?

**CHAIR**—Yes.

**Mr Cusack**—Probably the easiest thing would be either to source from overseas or to go to something like tree planting to have a home-grown sink because there are no other options. There will be no manufacturing or fuel efficiency options left within a decade or so. Is that what you were driving at?

**CHAIR**—Yes, that is what I am referring to. Where would your options be? If you were going to get any credits at all I would see that probably forestry or some of those areas would be the only chance the industry might have.

**Mr Cusack**—Yes, and it might be difficult for some, depending on the locality, to have—

**CHAIR**—That would be a cost though?

**Mr Cusack**—Of course, because there is a very large area of forest needed.

**CHAIR**—We have been focusing on carbon dioxide, which is the primary source of your emissions, but there are other greenhouse gases. Do you think that we are being too narrow in our scope in just looking at CO<sub>2</sub> and not looking more closely at some of the other gases?

**Mr Cusack**—From our point of view, we do not have a vested interest in anything else but it would seem to be logical to have a comprehensive approach incorporating methane and sinks as part of a total scheme.

**CHAIR**—In your position, I dare say because it is easy to calculate what your emissions are, you would be fairly strong in your opinion that we should be looking at all emitters, not just the bigger emitters in the system.

**Mr Cusack**—That is correct. The broader the scheme was then the smaller one would think the financial impact would be on individual emitters if the scheme were extended across the entire economy or as much as possible across the entire economy.

**CHAIR**—You have mentioned three big companies that were involved in the construction industry. Most of these companies today are fairly broad companies; they have interests in a lot of other areas. Would it be possible for those companies to reduce their liabilities with the cement industry by owning other areas in the economy to offset the emissions from the concrete construction industry?

**Mr Cusack**—No doubt it would be. For instance, CSR are very large in timber.

**CHAIR**—Sugar.

**Mr Cusack**—Whether they wanted to do that, of course, would naturally be a commercial decision. It was only 12 months ago that they were trying to divest themselves of that entire industry. Something like an emissions trading scheme with costs involved might change the finances to make it more attractive, but if that was something they wanted to do as part of their investment strategy then, yes, I am sure they could do it.

My reading of the financial press at the moment is that those three majors in the building industry are reducing their scope of activities and narrowing down to their core activities rather than going into other areas. Whilst this could push them in one way or another, it would probably be for the wrong reasons if it was just for emissions trading. I think the easiest option would be for all of them to simply say, 'We will source cement from one of our other plants somewhere else in the world.'

**CHAIR**—But this is a worldwide construction industry, so it is not just Australia that is going to have this particular problem to wrestle with, is it?

**Mr Cusack**—No, but certainly Pioneer and CSR own cement manufacturing facilities in other parts of the world.

**CHAIR**—What I was saying there is that this particular issue, the problem with making concrete, is not going to be a problem just for Australia; it is going to be a problem for any other country that talks about a trading system.

**Mr Cusack**—Yes, and their ability to handle that, in terms of being able to reduce emissions through manufacturing improvements or utilisation of waste materials, all varies depending on their geographic locality, the availability of other materials, where they are in the investment cycle and so on. Some may be affected more than others, as you would expect. But if it were an international scheme then, sure, the impact would at least be spread and not concentrated on the Australian operations.

**CHAIR**—In your submission you made some comment about the fact that there should be some consideration given to steps that have been taken in the past to reduce emissions. Could you elaborate on that?

**Mr Cusack**—At the point of the investment cycle right now, we have moved a long way from where the industry was 10 or 15 years ago. If emission targets for 2010 were to be established on an across the board fashion, our scope for meeting that target would be constrained because a lot of the work has already been done, whereas in some other industries even internally some of the less efficient plants would have far greater theoretical scope—perhaps not financial scope but theoretical scope—to achieve those reductions.

**CHAIR**—So you would argue that any licensing system should take into consideration an industry that has already made a contribution to reducing emissions?

**Mr Cusack**—That is right. How that will be done I am not quite certain but one way perhaps would be to factor in some sort of benchmark comparison with best practice or similar practice. You would then get



some appreciation of what the industry has already done and how far it is likely to be able to go before it gets to the minimum that is technologically possible.

**Mr EOIN CAMERON**—Do you have any figures on how many people are employed in the cement manufacturing industry in the country?

**Mr Cusack**—Yes, about 2,000 people.

**Mr EOIN CAMERON**—Do you have any idea of the percentage of the ownership? Is it Australian owned entirely?

**Mr Cusack**—Not entirely. The industry would be around 70 per cent Australian owned. Queensland Cement is wholly Swiss owned and it is a large producer. Cockburn Cement in Western Australia is a small producer and it is wholly UK owned. The rest are owned by Boral, Pioneer or CSR and Australian companies.

**CHAIR**—On the matter of the issuing of permits, do you have a view on whether they should be given free as an emitting right? Or should they be on a scale? Should there be some kept back for new entrants into industry? Should they be auctioned? Do you have a view on that particular aspect of it?

**Mr Cusack**—It is a difficult question. I would expect that our initial allocation would be free some way or another. It would seem, from reading other literature on the topic, that it would be sensible to have some allocation available for new entrants and for establishing a price, but in that area I am no better off than anyone else. I simply read the reports about the US SO<sub>2</sub> system and others that seem to have those sorts of provisions built into the system.

**Mr McDOUGALL**—Obviously cement construction has come a long way because it is cost effective as well as relatively maintenance free, and because of all the other benefits you get out of it. It is very cost effective compared to its alternatives.

**Mr Cusack**—That is right.

**Mr McDOUGALL**—If you were to have to go into the cost of creating, say, sinks or something as your contribution, what sort of impact would that have on the cost effectiveness of it? Would the industry still be able to maintain its predominance or would it then start to lose out to other types of building materials? What would happen there?

**Mr Cusack**—It would still be a very attractive building material for cost reasons and for construction reasons. It is easy to handle and easy to get different shapes and the like. The most likely thing to happen would simply be to shut down parts of the Australian industry because their manufacturing costs had increased and to source cement from overseas at a lower price. The cement would still be available at the original low price and would not affect the commercial attractiveness of it as a building material.

**Mr McDOUGALL**—In other words, unless every producer in the world, irrespective of the country,

was not subject to the same conditions on an international standard then obviously that is what would happen.

**Mr Cusack**—That is what would happen.

**Mr McDOUGALL**—So developing countries have really got to be brought on board in relation to this question or it will simply go from local manufacturing to import.

**Mr Cusack**—That is correct, yes. There are plenty of people at the moment hammering on the door with imported cement from Thailand and Indonesia.

**CHAIR**—So it is possible to transport cement powder by bulk tanker or whatever?

**Mr Cusack**—Yes, it is a very large international trade these days. It was not the case 20 or 30 years ago but with the expansion in Asian economies there are huge plants that have been constructed there. Technologically they are very similar to the Australian plants but the Australian plants do not have the economies of scale that the plants in, say, Thailand have. There are individual plant in Thailand that make as much cement as the entire Australian industry. They have very favourable economy of scale advantages and with the international shipping scene being awash with ships at the moment there are very economical shipping rates back to Australia. There are not many impediments on that side to imported cement coming into Australia. The impediments that are there are related to their ability to capture a suitably large section of the market to make it feasible for them.

**Mr MOSSFIELD**—Is that the reason that there are not a lot of imports at the moment—that they cannot capture a sufficiently large section to make it to Darwin?

**Mr Cusack**—That is correct. The majority of the concrete business owns its own cement manufacturing facilities. For them to import would require them to shut down a large part of their own investment. There is considerable pressure on that investment to reduce costs. The buzz word in the industry is world parity pricing. That is where we are. Our prices are level with what the world can deliver to our door. With an emissions trading system that would not be the case.

**Mr McDOUGALL**—So you are a bit like the iron ore industry; your bulk commodity is continuing to reduce in price.

**Mr Cusack**—It is. The figures for the last five years show a declining real price.

**Mr McDOUGALL**—So, as the steel industry or iron ore was coming down over the last five or so years, so was cement.

**Mr Cusack**—Yes.

**CHAIR**—Thank you, Mr Cusack, for coming along and giving evidence.

**Mr Cusack**—Thank you.



[2.00 p.m.]

**HOSKING, Mr Leslie Victor, Chief Executive and Director, Sydney Futures Exchange Limited, PO Box N680, Grosvenor Place, New South Wales 2000**

**STARR, Mr Malcolm Douglas, Policy Director, Government and Legislative Affairs, Sydney Futures Exchange Limited, PO Box N680, Grosvenor Place, New South Wales 2000**

**CHAIR**—Welcome. We have received a submission from you and authorised its publication. Are there any changes or amendments that you wish to propose?

**Mr Hosking**—No.

**CHAIR**—Would you like to make an opening statement?

**Mr Hosking**—Yes, thank you. Sydney Futures Exchange is pleased to appear before the committee and assist the committee's inquiry into the regulatory arrangements for trading in greenhouse gas emissions. Naturally, we do not profess any great expertise in the issues specific to greenhouse gas emissions. However, hopefully we can clarify some of the structural and regulatory issues associated with trading emissions permits.

In our submission we have explained that futures markets have been helping business manage a wide variety of price risks for a very long time. Emissions trading is unlikely to throw up any insuperable problems, even if some ingenuity may need to be applied along the way. From the futures market perspective, the right to emit greenhouse gases is an asset which has a value. If that value is likely to fluctuate wildly then there is scope for futures markets to help manage the impact. Futures markets provide a mechanism to remove the uncertainty as to what value a permit will be worth at some point in the future.

There may be some suggestions from some quarters that it would be unnecessary to have any emissions trading and that governments simply hand out permits to existing producers of greenhouse gases. This would ignore the various benefits that I am sure the committee is aware of that flow from emissions reduction activities. In fact, SFE is well aware that the shift to free market pricing is not always welcomed by producers or buyers, even of commodities like wool or wheat that are much more tangible than the right to pollute. Even the strong likelihood of lower prices, in our experience, initially has some resistance from some buyers who have become comfortable with more stable price structures.

In our submission we have addressed this issue by providing the committee with an article which appeared in SFE's *Futures Forum* magazine last year, which describes how nearly all commodity markets evolve through some recognisable stages as they move from controlled markets towards free markets. Whilst not all the patterns established in other commodity markets will be relevant to emissions permits, the article nevertheless provides a useful road map of how markets evolve and the structural issues which ought to be addressed.

I should emphasise that it is too early for us to indicate when the SFE would be likely to provide

emissions futures contracts, if at all. All we can do at this stage is highlight some of the pre-conditions that we believe are most important, and they are these: the monitoring and enforcement of the permits must be robust but also cost efficient; the permit should be of standard tradeable grade but also represent as many as possible of the various types of emission sources and sinks; there must be a high degree of price transparency in the cash and secondary markets. The market needs to have reasonable levels of price volatility, otherwise participants outside the industry, such as speculators, will not participate in the secondary and derivative markets. Overall, the market must have a balance of diverse buyers and sellers motivated to participate for a whole range of various purposes. I am happy to answer any questions.

**CHAIR**—Thank you. Mr Starr, do you want to add anything at this stage?

**Mr Starr**—No, thank you.

**CHAIR**—Could I lead off and indicate that I am a bit of a novice in the futures market and I do not know a lot about it. In the area of tradeable rights, for instance, I might be buying into a sink situation with forests. At this particular time we do not have accurate measurements of how much carbon is actually captured in that area. Would we need to have a lot more information in those areas so that the market would be very clear as to what it was selling?

**Mr Hosking**—Yes, you would. As mentioned in my opening comments, you need to have quite specific standard requirements that are clear and precise. Otherwise, the transferability of the right against the emission may be clouded. Indeed, in some instances, if the amount of credit available from a sink was too imprecise, we would actually not be able to construct a derivatives market to manage the risk because we would not know what that risk really was because your specification was too imprecise. In fact, I could go one step further. I would believe that the Australian Securities Commission would have some concern about an exchange traded derivatives market being set up if there was any ability for, say, manipulation of the rights or if there was any uncertainty as to the exact settlement of those rights.

One of the most specific things that the Australian Securities Commission analyse when we seek contract approval, say, for a stock index contract is how we can settle it. That goes into how the stock exchange calculates it, which goes into detail of the precise value of each one of these shares in the index. I think the same parallel is in this market that you would have to be quite clear as to what the credit would be out of the sink before you had a tradeable permit with some confidence.

**CHAIR**—We have had evidence this morning from some sectors of the industry that they would prefer to see a tradeable scheme up sooner rather than later. Is it possible for a scheme to develop and as these types of things come on later it is dynamic; that as new product emerges to allow these tradeable rights to exist it could just be added on?

**Mr Hosking**—From what I understand of the market, yes, I do believe that is the case. In some ways a cautious and simple approach may be advisable in the first instance. All that you could deal in in the first instance may be the issued permit, and you bring on stream at a later stage, as early as possible, the ability to add credits like sinks, et cetera. All too often, in designing new markets, I think people go for the Rolls Royce model first off, when it would be more advisable to start with the T-model Ford.

**CHAIR**—So you do not see any particular problem in setting up a market? In fact there are some examples overseas. Have you had any dealings with those examples overseas? Have you seen any problems with them or do you think that they might be a good example to follow?

**Mr Hosking**—The Chicago Board of Trade is the example that we have monitored closely in relation to sulfur emissions. There were some minor glitches in the early stages in those markets which were rectified and the market went on to be quite robust. So that is an example where they did not start off with the perfect model, they started off with the simplest model to understand and then developed it through evolution.

**Mr BILLSON**—On the issue of being able to manage the risk: would uncertainty about what was going to happen with the issuing of future permits potentially be fatal for the futures framework? We have Annex 1 in the Kyoto agreement and then we have a whole lot of countries that are not there. Is that a significant problem for the sorts of things that you would otherwise trade in, where the market factors are more discernible, more reliable and there is not just vapour created overnight that has a tradeable value?

**Mr Hosking**—Yes it would be of an impact. An example of a parallel I could give is we have created a futures contract in Australian government bonds and it relies very much on the Australian government remaining in debt so that it actually borrows to have government bonds. But if the government sticks to its surplus budget objectives then there will be a diminishing supply of government bonds and, with that diminishing supply of government bonds, there will be a drying up of the secondary market of trading between banks and bonds, and the drying up eventually of the futures market—and the same will apply to an emissions permit program.

**Mr BILLSON**—The parallel that goes through my mind is development approvals for floors in city centres where, if you did not build to the maximum height, you could cash in the floors and build them somewhere else. If overnight the regulators say, sorry, you are building only 11 floors and that is all you get a permit for, and thanks very much we will have the sunlight, that throws those whole trading arrangements out the window.

**Mr Hosking**—That is correct.

**Mr BILLSON**—The connections between the primary and the secondary markets, and yours, are clear in the commodities you are trading in at the moment. What sorts of relationships would you be looking for with whoever is regulating the primary and secondary arrangements? How do you see those being worked through in Australia and then feeding into the international scene?

**Mr Hosking**—Again, I am sorry to use parallels but it is the easiest way for me to explain. The evolution of the Australian electricity market is a good example where the primary market is basically regulated by the National Electricity Code Authority, NECA. It is a body that was set up to set standards and criteria for proper conduct in the primary market. The secondary market, the spot market in that instance, is also administered by NECA whereas the derivative markets are administered by the Australian Securities Commission.

Our preference in actual fact is to go one step further and have the primary market administered by a

code authority that is in charge of issuing permits and the standards and specifications of those permits. But from that point on, as I said, a permit is a contract of value and the secondary market and the derivatives market could well be administered by the Australian Securities Commission. Indeed, it may be more preferable because there is a blurring of the regulatory lines of distinction between derivatives markets and secondary markets these days so, if there is already a body there to administer it and that understands it—it understands things like speculators squeezing markets and, in your case, environmental protectionists would be taking massive long positions in the credits, trying to force the markets—

**Mr BILLSON**—Sulfur dioxide and that.

**Mr Hosking**—Exactly.

**Mr BILLSON**—So Sydney's futures exchange would not be interested in pursuing this further if we could not satisfy you and everybody else that we had the front end of a permanent trading regime bedded down: certification, verification, a standard unit of emissions and, more particularly, how new emissions permits were going to enter the market place and on what terms.

**Mr Hosking**—That is exactly right. We could not set up a reliable secondary or derivatives market—and we are interested in doing both—if the contract terms were not clear with the primary issue of the permits.

**Mr BILLSON**—How does your market handle a diminishing unit? For instance, we have international commitments into the future and a unit of emission held by an energy producer might be discounted over a period of time to match our international obligations. Are you able to transact in, say, a bushel of wheat where you are losing three or four per cent of it every year? Is that a concept that you can accommodate?

**Mr Hosking**—We think so. It is a unique type of arrangement, which is why I mentioned there may need to be some ingenuity. If it is not a pure futures contract, there are still options contracts and other products in the derivatives range which do take care of instruments which are losing value or are losing worth.

**Mr BILLSON**—Because you have another variable in time.

**Mr Hosking**—Yes.

**Mr BILLSON**—And there is the discounting impact on it.

**Mr Hosking**—That is correct.

**Mr McDOUGALL**—Along the lines of what Mr Billson was asking, you have a situation where if we allow open trading and the regulatory framework is such that an industry survives on the purchasing of permits rather than cleaning up their act, that is one way that they could do it. If you were to put restrictions over that regulation so that they could only buy permits on the basis that they were achieving results at the

same time, what sort of impact would that have on a futures market viability? In other words, I see it as lessening the potential of being able to trade.

**Mr Hosking**—That is not exactly how I would perceive it. Those sorts of criteria limit the participants in the marketplace, so you may just limit the number of buyers of permits, which reduces the liquidity of the marketplace in the longer term. That is the only thing I could see in that scenario.

**Mr McDOUGALL**—From your study of what is happening in Chicago, is that an open trading system? How are the regulations overriding that?

**Mr Hosking**—As far as I understand it, there are no restrictions of that type. It is an open market where there is no obligation on the purchaser of a permit to use technology or anything else to be reducing their emissions at the same time. It assumes that the marketplace will find its own level and that there will be sufficient commercial incentives in the marketplace to design technology to create credits in emissions to on-sell into the marketplace. You are looking at it from the side where somebody buys a permit and then sits back and pollutes because they have those permits. But there are people on the other side who are seeking to sell the permits and credits and will be adopting technology to improve the number of credits that they can produce.

**Mr McDOUGALL**—I may be wrong, but I see it as far easier to control in a national scheme than in an international scheme. I think it comes back to the question that Mr Billson was asking: how do you control such an international futures market when you have only part of the world as participants?

**Mr Hosking**—Frankly, I do not think we would not be able to. Our vision of what may happen is that Australia would start off slowly with the simple trading of permits within Australia. Underpinning that would be a secondary market trading activity with some rules as to contract specifications and standards, and we would design a futures contract which allowed people to sell forward their permits et cetera. However, if a different style of permit were created overseas which was not fungible—offsetable—with the Australian permit, then that market is going to diminish. In other words, the secondary market in the permits needs to be across borders. The derivatives markets can design themselves all over the place, around whatever risks are required. It is important that our permits are fungible and tradeable with overseas permits in the secondary market.

**Mr BILLSON**—We have a problem with biological weapons achieving that. It might be a bit tougher on greenhouse emission permits.

**Mr MOSSFIELD**—You referred to a new regulatory authority being established in relation to the primary market in emission permits. Do you have a view on whether this should be a brand new body or whether an existing organisation such as the greenhouse office might take on the job?

**Mr Hosking**—From my limited knowledge and understanding of any bodies, all we submit is that it needs to be a body that is independent of the secondary and derivative markets. If there were one in existence that could be made to act as the regulator, I do not see any problem with that. Again, in the case of electricity, there was a national code authority set up with the specific task of doing it. I think it is more important to outline the standards and requirements of the permit and then see whether a body can administer



it.

**Mr BILLSON**—The technology to give life to that regulatory body would have to precede a whole lot of things. We would have to get that sized up. Are you imagining that that technical body would have its credentials verified to go into the cooperative green development type things that are provided for under Kyoto, where you can generate some ticks by activity in another nation to bring back here? Would you imagine that that is the sort of flexibility and credibility it would need to have?

**Mr Hosking**—In the ultimate market, yes. The more flexible and able to do those sorts of functions, the better.

**Mr BILLSON**—I have a bit of a vision—I do not know whether it is a fantasy or not—that we actually have that horsepower here in Australia for the region and we would be an independent regulator working in conjunction with the UN for our region. I would imagine that, if we could base that sort of outfit here, that would give a lot of strength to the Sydney Futures Exchange credentials down the track as well.

**Mr Hosking**—In my capacity as chairman of the task force to make Australia a regional, financial centre, I strongly believe that a first mover advantage where we set ourselves up as the regional regulator and designer of the infrastructure and assist in the designing of the secondary market—and Australia has a very good reason to do that; a vested interest in doing that—will very much help the Australian cause and it will help the secondary and derivative markets to flourish.

**Mr BILLSON**—Would you bring in the atmospheric division of the CSIRO, the greenhouse challenge office and other players? I always envisaged it as a bureau of environmental science or something that could get ticked off internationally and then was available to provide advice and verification for these sorts of transactions.

**Mr Hosking**—Yes, that is exactly what we have envisaged could be the potential of a first mover advantage here in Australia.

**Mr BILLSON**—The security of the whole arrangement seems to hang on penalties for non-performance. With the sulfur dioxide experience in the US, there was a squillion dollar fine and a requirement to purchase twice the volume that the permits were exceeded by. Is that the sort of heavy signal you would be looking for to make sure that what you were trading was solid and credible and that players in the field did not ignore that requirement?

**Mr Hosking**—From our experience in securities and equity markets and commodity markets, we believe that the sanctions—and the Americans have had much more experience than us in this—have to be of such a size that they are a significant deterrent to breaking the standards. Otherwise, people will find loopholes to get around them or the legislation will be seen to be ineffective.

**Mr BILLSON**—My last question is linked to the size of the units. I see a trade issue looming here with product coming into the annexure 1 world from outside. Those who have signed up to Kyoto would arguably have a price advantage because they are not that concerned about greenhouse emissions and

abatement measures and those sorts of things. Would your Sydney Futures Exchange be in a position to sell part-permits to attach to imports into the Kyoto world from outside the Kyoto world? What I am getting at is trying to neutralise trade advantage. If we said, 'Like the hot wind that separates Myer from the outside world,' and you walk in and you are in a controlled environment, I imagine that you might need to plug on some greenhouse equivalent attachment to products that have come in from outside the Kyoto controlled world. Is your Futures Exchange able to deal with that type of thing?

**Mr Hosking**—Yes, it is. In actual fact, that is the normal function between the secondary market permit size or product size and the derivative market. Take for example the foreign exchange markets. They deal in parcels of not less than \$10 million when they are dealing in inter-bank currency trades, whereas a Futures contract in currency is generally a \$100,000 contract. We try to bring the contract size down and fragment it so that you get more participation from smaller players. It levels the playing field and allows the smaller players to use the derivatives market as a substitute for trading in the big backyard of the secondary market.

**Mr BILLSON**—So if I am Comalco and I am going to expand my aluminium production I could go to the secondary board and buy my permits or go to you and buy them down the track to match up with my expected expansion?

**Mr Hosking**—That is correct.

**Mr BILLSON**—But if I think it is cheaper to bring in aluminium from overseas but that I have got to bolt on greenhouse permits because it is coming in from China or something, I could come to you and get a per load tag—

**Mr Hosking**—That is correct.

**Mr BILLSON**—to bring it into a Kyoto compliant trading environment?

**Mr Hosking**—Either through the futures exchange or as an over-the-counter derivatives deal with the bank. Then the bank would play off its risks through the futures market.

**Mr BILLSON**—Okay, thanks.

**Mr McDOUGALL**—Some of the submissions suggest that the initial permits be free. Obviously if they are free then we have not got a futures market, have we?

**Mr Hosking**—No. If the issue of the permit in the primary market were free, that does not stop people still wanting to reduce the amount of their emissions and selling some of the permits that they have received for free.

**Mr McDOUGALL**—What happens, then, if a sizeable industry in the CO<sub>2</sub> emission market gets its permits free and an industry which is competing with them and is not emitting CO<sub>2</sub> does not? Does the equity question become an argument in the sense that the person who is a big supplier gets a free permit and can go

out and make his profit on the futures market rather than on the commodity he is selling? Isn't that an equity problem and false competition?

**Mr Hosking**—It is inequitable and that is why some propose that the permits be sold by auction or by tender.

**Mr JENKINS**—How does it affect the market if there is a bit of a shandy? One of the proposals put to us says, I think, that 90 per cent of the permits are issued at no cost and 10 per cent are auctioned and that this would happen at the end of a time period. How would that meld into what was happening in a derivative market?

**Mr Hosking**—In both cases the impact is more on the secondary market. The permits are issued. If they are all issued for free there will be some people scrambling around in the secondary market selling permits they do not need, and the ones who are disadvantaged because they need more will be buying those. So the inequity really occurs when the ownership of permits is transferred around the place. The way the derivative market would work on that is that some people would say, 'Well, I don't know whether I need these permits so I'm going to hang onto them and not sell them. But I will cap my risk of the value of the permits going down by selling futures contracts or derivatives of an equal value. If the value of the permits falls in the next months and I sell the ones that I didn't want to sell before and lose value on them, I will offset the loss with an equivalent fall in the derivatives market.' So it is the interplay between the tradeability of these permits and who wants them and who does not versus saying, 'Should I sell now or in the future because I'm not too sure just yet.' That is where the derivative market comes in—to manage those price risks.

**Mr BILLSON**—Earlier you made a comment about conservation groups going along and those sorts of things. Obviously that would not trouble you because that is expanding the market. What about super funds? Do you envisage greenhouse gas derivatives as being less insecure than derivatives in other areas? Therefore, would super funds and the like be more heavily involved?

**Mr Hosking**—It may take some time. I do not think super funds will rush into a new marketplace and start picking up derivatives.

**Mr BILLSON**—They could not go in anyway now under the current law, could they?

**Mr Starr**—In regulatory terms the answer is still that the process is seeing whether those trustees have the capacity to manage the risk of the fund managers. In those terms it is no different, but the risks themselves might be much greater ones and therefore—

**Mr BILLSON**—Or different? Added to seasonal shifts, crop yields and so on, you have the vagaries of governments and politics. It is a wholesome thing to invest in, isn't it?

**Mr Hosking**—May I comment on your point earlier that we would be pleased to see environmental protectionists buying permits? We would not be pleased to see them getting a position where they are squeezing the price up artificially.

**Mr BILLSON**—I was just being provocative to see what your reaction was.

**CHAIR**—On the contract design on pages 8 and 9 of your submission you go into some detail about contract design and I dare say it is a very critical part of the whole market. You probably have covered some of it, but could you go into some detail about what you see there as being important?

**Mr Hosking**—Starting from the bottom section of page 8, the contract size really relates back to the point I was making earlier about the currency markets where the size of the cash market is usually \$5 million to \$10 million parcels, whereas we design \$100,000 parcels for contracts. That is to allow as many speculators and small traders into the market. You usually set the contract size smaller than the trade people would normally anticipate so that you get as many participants using that market as possible. You do not want just Comalco dealing with others of that size; you have got to have small players.

It is very important to design a contract so that it is not biased towards, say, the polluters versus the people that are developing sinks or other credits. At the moment, I could not forecast where most trading activity might occur in tradeable permits, but it sounds as though it might be in the early stages of an auction or a tender or an issue where those that are not wishing to hold their permits will quickly sell them on or sell them forward.

**CHAIR**—Or those who missed out trying to buy one?

**Mr Hosking**—Yes. That equates to a government bond market again, where the most trading activity in government bonds is during the tender period, when the superannuation funds are scrambling to get their portfolio in place, because that is the time when the price risk is at its least—at the early stage. You can lock in the price you buy with a derivatives contract and not have to worry about it any further. We would have to analyse the market just to see where the most concentration occurs in buying and selling.

Certainly, the way the contract is settled is always one of the most controversial areas; firstly, whether it is going to be a deliverable contract. In other words whether you have to pass a permit on which does allow you to emit the gas or whether it is just a cash settlement of the differences. Some futures contracts are cash settled and the actual commodity is not delivered at all. It is just settled against an index or something. The more traditional contracts are deliverable. I would imagine that the emission permits contract would be a deliverable contract, otherwise you would be putting an added complication into assessing whether somebody has emitted a gas or has created a credit in a sink, if you did not have the actual delivered analysis for that.

The coal industry is a perfect example of where there are very high levels of vertical integration. They own the mines, the ships and the steel mill, so they can control their price risks through that chain of vertical integration. The more vertical integration in a market, then the less there is price risk for other participants or for the owner of that market itself, and so the less the need for a secondary market and, most particularly, a derivatives market.

The issue of transparent market information is one of market confidence. In other words, the more information on price and on traded prices that is disseminated, the more transparent the market is and the better informed the market is. If, say, emissions permits were bilateral agreements between counterparties that

were done over the telephone and not disclosed to the rest of the marketplace, a doubt would be created as to whether the trade that you just did in an emissions permit is as good as the one that was done down the road at the same time. To eliminate that uncertainty and lack of transparency it should be a requirement either in the contract rules or specifications that all contracts and all trades be reported and publicly disseminated as soon as possible. There are plenty of vendors and such who can do that.

History shows and our analysis will show that markets where the prices that are discovered in the secondary market are rapidly disseminated create more liquid markets and more confident markets than those where prices are not disseminated. Again, the coal market where nobody knows who has traded what is a very non-transparent market and difficult to trade in, whereas the financial market where the secondary market trades are conveyed every second is a very liquid and deep market.

We have spoken already about the underlying commodity being easily definable: the simpler the specifications of the permit the easier the marketplace will be able to understand the trading rules and the more fluid the market trading will become. The best markets are ones where, in the negotiation for price, you are actually only negotiating price; you are not negotiating size of the market or variations in contract specifications. It goes to the heart of the difference between an exchange traded market and an over-the-counter or private negotiation. If you are only dealing in black T model Fords with four wheels and three gears, all you are dealing about is price, but if you add shiny bumper bars, different colours and different drives et cetera, then there is a variation there which blurs the exactness of the price. The simpler the trading permit—down to the T model Ford description—the more accurate the price discovery will be for everybody concerned.

Of course, the contract design of the primary market needs to be capable—and it is in an emissions permit regime—so that futures contracts that are readily tradeable can be designed. Basically, what we have listed there is true for any market whether it be in emissions permits, water rights, electricity production, pork bellies or government bonds.

**CHAIR**—Thank you very much. I think you have been very expansive.

**Mr Hosking**—Thank you.

**CHAIR**—This is the end of the public hearings today.

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

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

**Committee adjourned at 2.39 p.m.**