

# Speech transcript

## **Garnaut Climate Change Review: Emissions Trading Scheme Discussion Paper**

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It's very good to see such interest in our work and I look forward to a lively discussion session in a little while's time. Thanks CEDA for hosting the event. CEDA's played a big role in providing for important public policy discussion for a long period of time. For 30 years I've been addressing from time to time CEDA events about economic developments in Asia, Australian inflation and productivity performance and many other issues, a range of trade issues. This is the first time I've been here on climate change. I've been on a steep learning curve over the last year and I'm grateful for many Australians who've been working in this field long enough to give us good foundations to work on.

Today I'm going to talk about a particular part of our work, our suggestions for design of an emissions trading scheme. We've now put two major discussion documents into the community. One was our interim report in February. That had its origins in a promise by the now Prime Minister some months ago that, in addition to bringing out a draft report in the middle of this year and the final report at the end of September, we'd give the community a view on our thinking along the way through with an interim report early in the year.

The origin of a discussion paper on an emissions trading scheme now rather than mid year is that the government has a very tight timetable for introduction of an ETS, attaining to have it operating in 2010 and so we thought that getting views, proposals, suggestions out for public discussion early would be helpful to the whole policy making process. So the ETS discussion paper was released last Thursday. That gave you all a [vista] to read it, so I probably need not spend a lot of time on the detail, but I'll spend a little bit of time on the detail.

An emissions trading scheme, an ETS – I'll use the shorthand because I'll use the term quite a lot – will be the centrepiece of Australia's climate change mitigation policies as David mentioned and as the CEDA discussion of climate change last year revealed, there are other

approaches. Quite a lot of economists like the idea of a carbon tax because it's simple, straightforward, don't have lots of dead end arguments about free allocation of permits, less corruptible more generally, but there are some advantages in an ETS. If you get it right, if you have a transparent, clean system, then trade in permits to emit can get the rights to emit into the hands of economic agents for whom it's most valuable and that has the affect of reducing the costs of mitigation.

If a government is firmly committed to reaching emission reduction targets, then an emission trading scheme can achieve those targets more reliably than a carbon tax, where you would have to experiment with the rate over time before you achieve the right calibration and you might have to continually adjust it. So for those reasons, a good ETS, I think, has advantages of a carbon tax, although I would be the first to agree that a carbon tax would be better than a corrupted ETS. But that debate's behind us I think. The Australian polity has committed itself to an ETS. It did that before the last election. The previous government, the Commonwealth Government, was headed towards introduction of an ETS. The current government has confirmed that view.

Reduction in emissions, in greenhouse gas emissions, is going to be a major reform. It's going to be a costly reform, but the cost will turn out to be manageable if we do it right and our design proposals for an ETS are about getting it right. In the work on design principles with the secretariat I work with based first in the States, based in Melbourne and now with a commonwealth component, we focused on first principles. There are lots of ideas doing the rounds on elements of design of an ETS. We've got a number of examples of operating emissions trading schemes around the world, including one of the world's first, perhaps the world's first, in New South Wales with the G-Gas Scheme. Had the experiments in Europe over the last few years, but we didn't want to start the analysis in the middle. We wanted to start with first principles and the design proposals in our discussion paper reflect that.

The reviews model for an ETS is forward looking. The aim is to minimise the cost of Australia's adjustment to a low emissions economy. We recognise that the value of Australian mitigation will depend on what other countries do. Australia's effort is only fruitful as part of a global effort and so the design principles have to be cognisant of the conditions that will be most helpful to promoting an effective global agreement. And we recognise that the world is groping its way towards an emissions reduction strategy and approach, that there's a reasonable likelihood that over time, perhaps unfortunately over a long period of time, we will see the emergence of something of a global trading scheme in emissions permits, so that we want what we do in Australia to not only be helpful in the emergence of an effective global mitigation regime, but be able to link to that so as to reduce costs of abatement.

We see the discussion paper as the beginning of a discussion and this large gathering today is a very important part of that and the discussion will shape our final recommendations in the main reports.

The single most important principle guiding the ETS design is simplicity. We think that's important because comprehension of how it works, transparency in how it works, is going to

be very important to the credibility of the scheme. Simplicity is also likely to be associated with efficiency, especially with the minimisation of the inevitable transactions costs associated with such a scheme.

Credibility is essential to ETS design. Participants in the market and in our polity must form the view that the arrangements that are put in place are here to stay. If there is continued doubt, continued lack of credibility in the scheme, that's going to increase transactions costs, raise the supply price of investment, inhibit the investment that's going to be necessary to achieve efficiently the transition to the low emissions economy.

I'd like to say a little bit about the starting point of the ETS and that is setting the limits on emissions. We could see this as being or we should see this as being extrinsic to the design of the ETS itself. Our government will set the emissions targets or limits and it will do that with a lot of considerations in mind. Once the targets have been set the role of the ETS is to minimise the cost of reaching those targets, but the starting point of the scheme is the setting of a long term budget and a firm emissions trajectory. No domestic decision made by Australia in the area of climate change mitigation will have greater international ramifications and the choice of Australia's emissions budget and it obviously will also be crucial in determining the cost of mitigation in Australia.

I just want to put on the screen one slide to illustrate a particular point about targets for emissions reductions and I hope I understand how this works – yes. It's common for targets for emissions reductions to be expressed in terms of reducing emissions by a certain percentage by a certain point in time. For example, in the current government's policy, there's a target of reducing emissions from 2000 levels by 60% by 2050 and so if our current emissions are there, a reduction of 60% by 2050 could be indicated by the orange dot. But we could get to that target with a number of different trajectories.

We could increase emissions quite a lot for a while and then bring them down rather sharply or we could get to that target through a much more gradual process. Well what matters for global warming is the total amount of emissions that go up into the atmosphere, so that the trajectory that involves a big increase for a while and then a sharp reduction will be associated with the release of far more emission into the atmosphere than a flatter trajectory that moves more directly to the target. That's a very important distinction. Most of the policy discussion, not only in Australia but in the world, is focused on targets at some points in time, but it's the area under the curve, the curve defining how you get to the target, that actually matters for climate mitigation.

So we'd like to think about a budget for greenhouse gases. There's a certain total amount of emissions. The area under the curve that the world can afford to put into the atmosphere if we are to avoid risks of dangerous climate change and we should be thinking of that as we set our objectives for emissions reduction.

Now increasingly in addition to long term targets, governments are identifying intermediate targets. For example, there's a strong focus now in the European Union and in the

international discussion on a 2020 target. Well, that somewhat constrains the path by which you get to a long term target, but it still has the problem that you're looking at a particular point of time. It's the area under the curve that's crucial for climate.

As we discussed at some length in our interim report in February, there are strategic as well as domestic policy considerations. Why, when government sets a target, it should set more than one emissions budget. In the interim report I suggested that Australia should have an emissions budget to which we are prepared to commit unilaterally in the absence of comprehensive global agreements and then more ambitious targets that we are prepared to move towards in the context of a comprehensive international agreement.

In the ETS paper, we present in a stylised way a way of looking at the multiple budgets. We will commence the ETS beginning in 2010 within an already committed Kyoto target. The Kyoto targets have become internationally legally binding following our acceptance of the Kyoto Treaty in December. That commits us to holding emissions to 108% of 1990 levels on average over the period 2008 to 2012. We're pretty close to that now. It's often said that we're easily going to meet those targets – it actually won't be all that easy, but that is the target that we have agreed internationally for the period up to 2012.

There'll then be a very important question – what targets should we set for the period beyond that and there's much international discussion, there was tense discussion at Bali about targets for the period 2012 to 2020 and we're going to have to make decisions on that in time to give certainty, a structure to the putting in place of our own ETS in 2010. That will be a decision before we have seen all of the current post Kyoto negotiations play themselves out. It will be before a new US president has had time to change American policy on these things, change we will get, but the details of that will emerge through 2009-2010. We will need to take a view on 2008 to 2020 upon which we build the initial phase of our ETS before we have all that information and we suggested that the guiding principle should be ... we should do something comparable with other developed countries. Europe's given one lead. We will need to form an assessment what others are doing.

Then we might think of another more ambitious trajectory committed over a longer period of time that we would be prepared to commit to in the context of all developed countries making firm commitments and they're the big unknowns, the United States, and we'll learn a lot about United States policy over the next year or two, but we would suggest locking in to a trajectory towards minus 60% by 2050 once it's clear of the shape of developed country commitment.

But the interim report emphasised very strongly that there will be solution to the global warming problem without major and early commitments by developing countries. All of the momentum, not all, most of the momentum in increases in emissions is now from the rapidly growing developing countries. The international discussions and feelings around the world of justice, taking into account historical responsibility, have led from very strong pressures for developed countries to take the first step, but there will be no solution to the problem unless the major developing countries enter firm commitments on constraining emissions growth pretty soon and we think that it's in Australia's interest to encourage that and to put on the

table the stronger commitments to emissions reduction that we will be prepared to enter if we do get the commitments that the world needs from the major developing countries and so then you would have another trajectory. Each of these, these are purely stylised – don't try to work out interim targets from them. We've got a lot of work going on on the actual numbers and you'll see the results of that in our draft report in the middle of the year and in elaborate detail in the final report in September. But that gives you an idea of how we're approaching the issue.

Our scheme, once you have the targets and budgets, is a very simple one. We suggest that the scheme should be administered by an independent regulatory authority. We've given it the name 'The Independent Carbon Bank'. Others will be able to think of better names, but the role of the independent authority will be to put the...to divide the trajectory into permits by established international precedent. There'll be permits allowing the emission of a tonne of carbon dioxide equivalent. The sum of the permits will be...will equal the trajectories. We would have in mind a regular auctioning or a regular competitive process distributing the permits, a competitive process organised by the independent carbon bank. You would begin the auction process in advance of the beginning of the scheme so that decisions...or so the market will begin to form a forward price curve, give guidance on price discovery. Companies that need the permits would start to get themselves set with the permits that they need and then you would put the permits into the market on a regular basis. It could be a weekly competitive process or a fortnightly or a monthly and each year you would allocate into the market the number of permits corresponding to the emissions level on the trajectory for that year.

The independent carbon bank would manage this process. It would monitor and enforce compliance for permit acquittal. It will be a crime to emit carbon dioxide or other greenhouse gases without a permit and the regulatory authority would monitor and enforce compliance of permit acquittal. It would also administer something that we think is essential for the environmental and economic integrity of the scheme and that is transitional payments to trade exposed emissions intensive industry pending the introduction in competitor countries of comparable carbon pricing arrangements. The independent carbon bank would administer that and make permits from the revenue that it receives. The independent carbon authority would also have capacities to lend permits requiring repayment so that over time they were enforcing the trajectories that were established by law.

Once permits were issued into the market, there would be no time limit on their use, except that permits issued for a particular period couldn't be used before that period, but they could be used at any time after that. There's been a fair bit of discussion of the rationale for auctioning the permits. We think that a competitive process offers very important benefits over free allocations - benefits of transparency, simplicity and credibility. Free allocation will be highly complex, generate high transactions costs and require value based judgements and would inevitably be the focus of intense political activity. Both economic theory and the European experience teach us that where the permits are allocated freely or auctioned, the price impacts through electricity and other prices on households will be the same. The point is

sometimes made that if you give free permits to establish generators, then they will not need to price in the effect of the cost of the permit into the price of electricity, but that permit has a scarcity value, whether or not the person who owns it has paid for it and the owner of the permit will be able to extract value from that in the market.

The analogy might be an inheritance of a house, the fact that you get it for free will not affect your rental behaviour, the price that you charge for rent or if you sell the house, the price at which you will sell the house. The free allocation would be what economists call a lump sum transfer. It affects the distribution of income, but does not affect decisions on pricing or investment.

One important design feature of our scheme consistent with simplicity is that we don't think there should be price caps or flaws. We think that the market should determine the price. The market will form a view of the price of permits that's necessary to force the structural change that has the economy living within the legislated trajectories and if you put a cap on that then you don't reach your targets. Obviously the mitigation costs will be lower, but you haven't met your environmental objectives.

We think that the flexibility that some think we need to have through price caps can be achieved in a way that's consistent with environmental objectives through the inter-temporal variation in the use of permits through lending of permits from the independent regulatory authority under conditions under which they must be repaid.

We think that setting up a system like this will probably introduce a fairly strong tendency in the early stages for the hoarding of permits, especially if the trajectory turns out to be a steep one, a trajectory that's informed by comprehensive global commitment to effective mitigation objectives. In those circumstances where we start with a relatively light emissions reduction target but there's high expectation that the budget will be tightening over time, in those circumstances it's likely that some people will buy permits with a view to holding them and using them later when the game gets tougher and so there's quite likely to be a tendency to what is called bank permits in those early stages. It's not inevitably the case – there may be some market participants who look forward to a great technological breakthrough a bit later who think it's better to borrow permits and who are prepared to back financially their view that mitigation will get easier over time and to use permits more readily now.

There's a very important question - how the large amounts of revenue that will be generated from the sale of permits are used. In the modelling exercises that will be reported in the draft and full reports we will talk about this in some detail, but the amount of revenue will be very large by almost any standard, but they will be limited and there will be many claims on them and these claims have been discussed in detail in our interim report. They will include or the claims will include first of all the payments to trade exposed emissions intensive industries and we see this as an intrinsic feature of the scheme necessary for environmental and economic reasons, hopefully becoming less important over time as other countries adopt our carbon pricing.

Much of the permit revenue will have been received by government simply as a transfer from households. At least in the early stages, most of the value of the permit will have been...most of the cost of the permit will have been passed through to households. For example, in the electricity sector, probably a complete transfer in the petroleum pricing sector and there's no doubt this, in itself, would put burdens on households and costly burdens, difficult burdens on low income households. So we're suggesting that part of the valid claim on the revenue would be tax, social security, energy efficiency, reforms that would assist the adjustment of low income households – a big topic in itself.

There will be demands as there is under any major structural change associated with reform for support for heavily affected communities. There is a possibility that the coal based energy producing regions of Australia, and we've got some big ones in New South Wales – Hunter Valley, the Illawarra – will be particularly damaged by this change, this change to emissions pricing. That may not be the case and everything depends on whether the current activity in research development and commercialisation of new technologies for carbon capture and storage is successful.

I see good prospects for this and within our review having a lot of work done on this and certainly there's a strong case for use of some structural adjustment funds pre-emptively to accelerate the evaluation of these technologies. There's also a case on public goods grounds, standard public finance grounds for support for firms engaged in risky activities commercialising new technologies generally, so there's a double case for carbon sequestration and storage, but a case for public funding of innovation more generally in relation to the new technologies.

There will be strong demands on expansion of public infrastructure associated with the transition to a low emissions economy, new patterns, stronger, more effective, more national electricity transmission grids, transportation networks for carbon dioxide for sequestration, possibly improvements of the gas pipeline infrastructure. Some of these things can be handled smoothly by markets. Many cannot and will at least require government regulatory action and it may require in the early stages public investment in network infrastructure.

The discussion paper talks at some length about the potential linkages of the Australia ETS to other countries. This is a really important question. I'm not going to have time now to go into it – maybe we could get into it in discussions. There will be some very important choices. We could simply integrate with the schemes of some other countries and if we did that with a big country, like the European Union, we would effectively be absorbing characteristics of their scheme. We would end up taking their price. If they've got a well structured scheme giving an economically efficient forward price curve, we would absorb that. If they had an unbalanced and inefficient scheme like Europe had for several years, we would absorb all of that, so there are judgements to be made when you're considering linking to another scheme between the undoubted advantages in reduction of the cost of abatement through spreading abatement over a large area and comprising the integrity of our own scheme. We'll have to make those judgements case by case.

The interim report pointed to some very large opportunities, probably for relatively low cost abatement in neighbouring countries associated with management and slowing the deforestation process and encouraging associated forestation and reforestation, so close links with neighbouring countries could be very important to the scheme. There may end up being choices between different ways of linking overseas. We may need...at the moment, we probably would have to choose between close links with our developing country neighbours and with Europe because Europe probably at this stage would not allow linkage with a scheme that was strongly influenced by forestry credits, which are not allowed in the European scheme at the moment.

I'd also like to draw attention to one part of the discussion paper that hasn't received much public attention, but which I think is both interesting and important, that's section 5, where we talk a little bit about how the dynamic process of adjustment to the carbon pricing will work its way through the Australian economy. There will be a lot of strong initial reactions and I think that once we are pricing emissions, we'll all be surprised at how widespread the emissions reducing responses to that are. In the big sector in Australia for emissions, proportionally bigger than in other countries, is the electricity sector, stationary energy here accounting for over 50% and substantially more than 50% of expected growth in emissions.

We'll probably see fairly quickly changes in the balance, at least at the margin, of coal and gas and gradually see the greater use of renewable energy. There'll be some very important and complex interaction between mandatory renewable energy targets and the ETS and we've suggested in the discussion paper that this should be analysed closely because there could be some unexpected effects in there, but I suggest you have a look if you're interested in how the scheme will actually interact with the economy in that concluding section of the paper.

So the model presented in the discussion paper outlines what the review thinks are necessary measures to provide investor confidence, low cost abatement and domestic and international credibility in an ETS. We see simplicity and credibility as essential characteristics of an ETS that's to do the job of minimising the cost of adjustment to a low emissions economy. There will be things to be learnt once the scheme's in operation and I'd suggest and in our draft report we'll probably recommend that after a couple of years, before the deeper emissions reductions post 2012 start to take effect, we have a review of details of the scheme just to make sure that everything is operating as expected. And to get things right, to have a basis in community support for the ETS that allows stability over time in the parameters that will determine how it works, we need a robust discussion now. Let's have a discussion now about the design features we want to operate so that once we put the scheme in place it will be stable over a long period of time. Thank you.

# Q&A transcript

**Q** Thanks very much. Tim [name], Commonwealth Bank. Professor, in the Shergold Report he did actually suggest that there'd be upper and lower limits to prevent the damage to achieving long term targets of heavy spikes, either upwards or downwards, as well as the impact that that would have on the economy. You've ruled that out in your proposal. I'd just be interested, how do you see then the system adjusting or responding to heavy spikes, either upwards or downwards, in both meeting the targets and also in terms of the impact on those industries and the economy?

**A** The price caps and flaws don't help you meet the targets; they stop you meeting the targets. Once you hit a price cap, your target doesn't matter. You're issuing new permits potentially without limit to stop the price going harder, so the idea of a price cap is to turn the ETS into a carbon tax at the point where the price cap is reached. From that point you don't try to meet your target; you just issue more permits; that's the way it works. So there's a choice between having a firm commitment to a target and let the market determine the price and wanting to limit price and therefore limit impact on the domestic economy. The cost of limiting price is the target blows out.

But you do need flexibility and in our proposals there are two sources of that. One is lending from the carbon authority so that...there will be fluctuations and demand for permits from time to time. We saw in Adelaide a couple of weeks ago a heat wave that was way outside any normal experience and energy use went up enormously. Well, if that happened on a national scale, then that will be a time when the price of permits was tending to go higher. All of the gas and coal fire generators would be running at greater intensity and the emissions would be greater. We see that type of situation being handled by lending permits and so you get a smoothing over time and the market would do the smoothing of price over time.

There's also capacity for limiting price movements in our economy through linking with international schemes. I noticed that New Zealand in its proposals for an ETS, which will come into force at a similar time to ours, they're proposing one way linking with the European Union so that as an alternative to buying a domestic permit, any domestic enterprise wanting to emit could buy a permit from the European Union. It's not two way linking because New Zealand includes agriculture and forestry and the Europeans don't want to recognise that within their own system, but New Zealand allowing a use of European permits would put a cap on prices at the European level. I think there is a case for that. There are also some qualifications. We've set out some of the issues affecting that choice in the discussion paper and in the final reports. We'll address those questions of choice in international linkages in much greater detail.

**Q** My name is Matt [name]. I'm from ASPO, the Association for the Study of Peak Oil and Gas. I'm the guy in our group who's doing the number crunching. My latest research on the peaking of crude oil production has now reached even the Pentagon e-tagging on some slide shows of Matthew Simmons. My question is, have you incorporated the global peaking of oil production in your modelling and have you considered that in October last year that is the context for that question [name] Vice President [name] has actually conceded that we have the problem of 300 \*4.38, which means that in the next decade we will have highly disruptive oil supplies? The second question is, have you now started to incorporate James Hansen's new targets? It's not 450ppm, but 350ppm. We're actually already 20 years in \*[inaudible] mode. Our task is not only to reduce emissions but to take CO2 to out of the atmosphere.

**A** Two different and separately challenging questions. The second one first. In our modelling we're focusing on a range of concentrations in the atmosphere going down to 450, but as we said in the interim review, we're aware that many Australians, including conscientious Australians who are very concerned about impact on the natural environment think that we should look at lower objectives, like 400 and in a submission from the Australian Conservation Foundation, the Climate Institute and World Wildlife Fund for Nature there was a strong suggestion we should model the 400 parts per million case. There are limits to the modelling we can do in the time so we won't be modelling that case, but we will be assessing it and saying something about it.

What we said in the interim report is that 400 parts per million has already gone. If the Australian Conservation Foundation, the Climate Institute and the World Wildlife Fund are right about damage to Australian natural icons like the Great Barrier Reef and Kakadu at 450 parts per million or anything higher than 400, then unfortunately it's going to be very hard to stem that damage. The only possibility would be to, as you indicate, adopt some overshooting scenario where we, over time, move towards a level of emissions that falls below the earth's natural capacity to sequester greenhouse gases. That would be a very tough ask, so very important issues, very tough ones. One might think they were impossible given the current state of policy discussion all over the world, but we'll have some discussion of the overshooting scenario in our final reports.

On the first point, there are obviously some very important relationships between scarcity or abundance of fossil fuels and the emissions reduction objectives. The world's been a bit surprised by the way the scarcity of oil has been reflected in price in the last four year. We know the world's been surprised because if you go back only three or four years the long term forward price of oil was about \$20 a barrel or in the 20s and now you get a forward price that's very similar to the spot price of \$100. So oil has become much more scarce than the weighted average of market opinion only a few years ago expected it to be and the difference is immense.

One can see a high price of oil as doing part of the mitigation task for us. The increase in the price of products based on petroleum is affecting use of many of those products, putting

upward pressure on electricity prices everywhere. There is the beginning of an adjustment in urban transport in response to higher prices, so there's a sense in which the cost of mitigation, the cost of reaching the targets is lower if the market price of fossil fuels is higher. But when you look more closely at what is the other adjustments that have been going on around the edges of high priced oil, one can see that it's actually rather a complex matter. There's no reason in economic theory why a high price of oil should necessarily send demand in an emissions saving direction towards use of renewables more or less than it sends demand for energy towards other higher emission source of energy like coal or conversion of coal and shale and tar sands into liquid petroleum.

Empirically it seems that in the last few years there's been more pressure of the latter kind, more pressure from the high price of oil towards use of higher emissions fuels and for some time, for quite a long time, the higher emissions fossil fuels are not going to be terribly scarce. The world resources of coal are immense. So it's not clear that we are going to get a great help from the price of oil. Over a longer period of time we may very well do so.

**Q** Tristan Edis, Ernst & Young. My question is if the Lieberman Warner Bill was signed into law in the US, what kind of target do you believe Australia should adopt for the 2020 period?

**A** I don't want to duck questions, our review process are very transparent, but we've got a lot of work going on on that and I'll be happy to stand up in public forum later in the year when we've got all of that work under our belt and talk in detail about the targets.

**Q** Adam Kirkman from Protivity. Congratulations on the latest instalment. Question that I was discussing with some colleagues this morning is the issue of the CDM and the national emissions trading system. There doesn't seem to be a lot of commentary in the work done so far on what role the CDM may play. Is that deliberate or what are your views on that seems to us certainly that emissions trading system that's going to be chasing a 60% reduction target by 2050 is going to create a lot of scarcity in the market and when you have what is perhaps considered a default international carbon currency in the terms of CERs, wouldn't we want to be chasing those kinds of low cost opportunities that may exist international?

**A** Well, for those who are not familiar with the jargon that CDMs are the mechanisms established under the Kyoto protocol for crediting emissions reductions in projects and mostly in developing countries against commitments to emissions reductions in developed countries. Europe has been the place where the trade and permit generated through the CDM mechanism has been most active. It's a very large trade. European firms have been active in looking for opportunities to reduce emissions in projects in developing countries. We do discuss this project type mechanism, especially in the appendix on international linkages in the discussion paper.

Project based approaches to reduction in developing countries are very much second best or third or fourth best, much better to have developing countries accept a cap and then to trade in savings beneath that cap. The problem with project based mechanisms is you find it very

difficult in practice to guarantee what is called additionality, that the reduction in emissions is greater than you would get anyway. There's a lot of investment going on in energy efficiency in the developing world and it's a rather difficult task to know that they would not have occurred but for the CDM mechanism and the mechanism requires a certification that the reduction in emissions are additional to what would have gone on anyway and when they're applied to deforestation, when you've got vast forested areas like, for example, in Eastern Indonesia, you may receive credits for conservation in one area that simply leads to accelerated logging of another area and very difficult to avoid those dilemmas unless you've got an overall national cap.

And so I think what we should be working towards is getting developing countries to accept a national cap and then...and giving a lot of technical assistance and support in establishing the mechanisms that would be necessary to make that work and then being willing to trade the savings in emissions below their overall national cap - that's the best. Pending that, there is a case for CDM type mechanisms. How far we would want to push the use of those mechanisms will depend on judgements about what chances we have of getting further with first best approaches.

**Q** \*[Inaudible]. My question is about \*[inaudible]. There seems to be \*[inaudible] in the atmosphere today. My issue is it seems \*[inaudible].

**A** Well, the question of starting points, cut off points, only arises if you've got an offsets type mechanism. If you're simply taxing emissions or requiring a permit from emissions from a certain point of time and giving credit for sequestration of carbon from that point in time, then the question of the starting point is not I think a crucial one or am I missing some point in the question...and we would very much want to have a very wide coverage where to the greatest extent possible you're simply requiring a permit from any emission from a certain point in time from the beginning of the scheme and you're giving a permit for any sequestration that occurs from then.

**Q** \*[Inaudible] really about your assumption that you can pass costs on which seems to be based on the fact that there is very little lag between the production of the good or service and the emissions such that you can actually start from day one to pass the cost onto customers which is the assumption in the scheme. Where you've got waste that was buried 40 years ago that is still producing methane there's very little opportunity to recover that cost from the customer from 40 years ago.

**A** Okay, good point. To be honest, that's a point I hadn't thought about. We'll note that and think about it.

**Q** Michael Bellstead from the Green Cooling Council. We have a particular interest in industrial gases, in particular the high \*[inaudible] potential refrigerants and the like. In the interests of what you said of simplicity and credibility, that would indicate that ideally you'd have an upstream approach for I guess applying the ETS system to these gases. Considering the high global warming potential of some of these gases, that would then imply a sudden and

dramatic increase in the price of these gases to the industry at the outset of the emissions trading system. That would then in turn have a very dramatic effect on that particular industry. Has that been modelled, is the first question and secondly, would there be any form of compensation for the industry as a consequence of that from the other revenues from the ETS system?

**A** Our modelling is going on now and will be going on over the next few months, so none of the results of that are available now. We've got some very good, very important modelling going on, but the use of the results are in the future. No, in our scheme we would like the proceeds of the permits to be applied to forward looking adjustment to the extent that they're applied to industry. Now there may be particular claims in equity for compensation for some particularly damaging effects on some participants in the economy. We would see those being evaluated alongside other claims on income distribution grounds. For example, alongside the claims of low income households for support, but that's the context in which we would see issues like that being examined.

**Q** According to your presentation it looks like the emissions would be reduced by 60% long term provided that 50% of the emissions come from electricity and perhaps 15% from transportation. Does it mean that the government will fund...or the policy that we try to target 60% of renewable energy in the medium term or are there sources like nuclear power and how will that cost in fact in an economy that is largely reliant on energy?

**A** First, you shouldn't try to read targets from the graphs. We deliberately didn't put any numbers on the axes, so I don't think you can draw conclusions from that. But on your general point, reductions in emissions, once you get the incentives in place, especially the pricing of emissions, are going to come from many sources. There will be an increase in the price of any goods and services that have a high content of emissions and which can't reduce them, so that if the coal, electricity, energy sector is unable to find ways of reducing emissions, then it will...if it's to stay in business it will have to pass on to households through electricity increases, so a substantial part of the increase in costs.

Now, higher electricity costs or petrol costs or costs of other goods and services embodying emissions will encourage savings of emissions. Probably that needs to be supported by other measures - improved information for households on how to economise on energy use if that's going to have a substantial effect on demand. Within the electricity sector, there's going to be very widespread and complex adjustments. Some emissions reducing measures are likely to be taken very quickly, just efficiency measures within individual plants and once there's a strong incentive to do so, you'll find firms doing that. How big those will be I don't know, but they will be significant. In the relatively early stages of the scheme, at a relatively modest carbon price, you're quite likely to get injection of gas into the electricity generated process within mainly coal based firms to reduce the emissions content.

There are many technologies being trialled at the moment which will reduce the emissions associated with standard technology coal based electricity generation. For example, a lot of work on the high emissions brown coal of Victoria on ways of efficiently removing water so

you don't waste a lot of coal energy just boiling off the water in brown coal. If they're successful that will save a lot of energy and a lot of emissions, but the big one for the coal based sector is carbon sequestration and storage and a lot of good work going on on this, including some work associated with retrofitting of established coal based electricity generators. This work can be accelerated by putting in place the right sort of incentive structures for innovation for firms innovating in the electricity sector to secure lower emissions.

Alongside all of this there'll be a strong incentive for development of renewables. We're seeing a lot of investment in the renewables industries at the moment, including at the research and development end. There are several listed companies on the Australia Stock Exchange who raise funds to seek to develop new geothermal power in South Australia and in adjacent areas of Victoria and New South Wales, heavy investments in research, development and commercialisation of clever new technology. One of the motives of that is the prospect of a price on emissions. I think we're all aware of the rather large investments that are going on around Australia in wind and other renewable energy sources. So we're going to move towards...well, you mentioned particularly the electricity sector – we're going to move towards meeting low emissions targets with contributions from many different areas and it's difficult to predict in advance exactly the combination of contributions that will get us to the targets. But we know from all of the work going on at the moment that there's going to be diverse and rich contributions to the mix.

**Q** Elaine Prior from City Investment Research. Professor Garnaut, did you look at a variety of different options for compensation for the trade exposed emissions intensive industry? And the proposal that you've got for calculating the theoretical commodity price and annual efficiency improvement factor would seem to reward early action rather than rewarding high base lines, but it seems pretty complicated to actually come up with those factors and did you look at a variety of different mechanisms for dealing with that challenge?

**A** Yes, we looked at a lot of mechanisms and we thought in the end that the best basis for compensating the...well, making payments to the trade exposed emissions intensive industry – I don't like to call it compensation because it's an integral part of the scheme itself – we thought the best way was the way that went directly to making payments to correct the market failures that we were trying to address and that's what we've come up with. Conceptually it's very simple. You have the ... and it would be the independent carbon authority that does the calculations. It would form a view on how much lower the international price, for example, of aluminium is than it would be in a world in which there was universal carbon pricing on a similar basis to Australia. What we would envisage is a strong group of quantitative economists and other analysts within the carbon authority making their best estimates of that and there will be elements of judgement in the end, but I think less contentious judgement than in the alternative approaches to that matter that we examined and we would see the carbon authority are being required to operate in a completely transparent way.

Some ways the model could be the productivity commission on a particular case putting out drafts of its views, receiving submissions in a public way, reporting publicly on the reasons for its decision and this would be a continuous decision making process with revisions every year. They'd be criticised on technical or other grounds if people thought they'd got it wrong and I think in that way we would end up with a robust approach. We would reach a conclusion, the independent regulatory authority would have an arbitral role on those matters, but it would use those powers in a transparent and contestable way.

**Q** Professor Garnaut, Frank Toppen from Caltex. In your report and in your talk today you talked about auctioning being made on a fixed schedule, weekly, monthly, quarterly or any other basis, but we know that some policy makers favour infrequent auctions, perhaps annual or maybe twice a year. Could you possibly elaborate on your thinking behind that observation or recommendation? And also you don't mention whether these permits would be acquitted at the end of the year only or perhaps more frequently, but one would assume it's the end of year only, but the first part of my question I think is the more interesting from my point of view.

**A** Well, the formulation that you read out does not exclude annual auctions. That would put a lot of weight on price discovery at a particular point in time and a lot of market participants might prefer an averaging process. Both the public revenues and the cost imposed on purchase of permits would depend in an annual auction on perceptions over supply and demand and permits prevailing at that point in time. More frequent auctions would allow an averaging over time. I don't think the transactions costs of more frequent auctions would be excessive given the depth of this market, given the turnover of this market, but if you've got documentation of views, arguments that point in the direction of less frequent auctions, our secretary would be very glad to get hold of them.

**Q** Christine Dina with the European Commission. You mentioned briefly the possibility of global scheme. How would you see that developing?

**A** I think it will have to develop in a piecemeal way and it will...we're on a trajectory now of different countries doing things in different ways or considering European Union as a country for this purpose and that's the path we're on. I think the emergence of an international scheme and an international price of permits would emerge through the linking of schemes. For example, if the European Union was to accept permits from Australia and Australia accept the permits from European Union we would end up with a common carbon price, pluses and minuses of that as I've already mentioned. But if, at some time in the future, we both agreed that we were comfortable with the design features of each other's scheme, we could choose to trade freely, in which case we would have one carbon price and other any countries that either of us are linked with would be likely to also have that carbon price. So I see a global scheme as developing piecemeal through this process and if the linkages became extensive, then probably the need will be seen for some form of international regulation, but I think that that will come after the development of lots of international linkages.

**Transcript ends.**

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