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**Compere:** Lord Mayor of Sydney, Clover  
Moore MP  
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**Speakers:** Ross Garnaut, Garnaut Climate  
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## Transcript:

ROSS GARNAUT: Thanks Lord Mayor. It is a great pleasure to be here and I've been through some important education in the last hour as I've been briefed on what the City of Sydney is doing. I have read some of the material before, but interacting with the Lord Mayor and her senior staff has added to what I know and understand about the ambitious plans for Sydney.

It is truly impressive. It holds prospects for reducing costs in the city, which will help keep the city competitive. It's a nice hedge insurance against the several factors of which the most important is not a carbon price - the several factors that for people reliant on the grid will be driving up electricity prices in the period ahead. So thanks Lord Mayor for that opportunity.

If you succeed – and Sydney is well on the track to success in economically efficient decentralised systems of energy generation and supply – you do avoid several large emerging sources of costs. In my report I talk quite a lot about the high costs, the rising electricity prices that are associated with inefficient regulation of Australian network and transmission infrastructure. I think it's quite a big problem. It's one that can be solved. I think now that it's been properly specified it will be solved.

But it's going to take quite a while to solve it and electricity prices will be going up in the meantime; it's a self-inflicted wound, but even self-inflicted wounds sometimes take time to cure. And we're going to have - we're already seeing some of the effects, but they'll become bigger in future, of higher gas and oil prices and coal prices - especially gas and coal - arising from the global boom in demand for energy and raw materials. The prices take a while to come through, but come through they will.

And every increase in coal prices on world markets will eventually put upward pressure on electricity prices in New South Wales. And we're going soon to have quite strong increases in gas prices, which is the other side of the coin of a very good development. The growth of east coast gas export industries. Economically good, but one consequence is that it will raise the price - the provision of export opportunities will raise the price of gas to international levels like they are in Western Australia.

Eastern Australia, up till now, has had gas prices that are much lower than international - than - yes, than international prices, much lower than Western Australian prices. Once you develop east coast export industries then the price will rise to international levels. And the other side of the coin to the gas export boom will be rising costs for businesses and households in Sydney and - to provide electricity and gas and energy from alternative mechanisms, which is ultimately the goal of the program here - will insulate you from that.

Now, carbon pricing will also put upward pressure on electricity prices. Substantially less than the pressure that is associated with the

inefficiencies in regulation of network infrastructure - there's been a tendency for carbon pricing to be blamed for things that it won't cause - but there will be electricity price increases coming from that.

Those increases will be less the less emissions intensive is your electricity system. And what's being designed here is a system that has very low emissions per kilowatt hour of electricity. So that will be additional hedging against price developments in future. So I'm very pleased to have learned a lot more about that and thanks for that Lord Mayor.

As the Lord Mayor mentioned, Australia is making rather heavy weather of introduction of carbon pricing. You, like me, would have a lot of friends in Europe - UK, Germany, France, Italy, the Netherlands, Spain; everywhere - and they really wonder what the fuss is all about. But still, we've got a big fuss on our hands.

We are in the midst of a great struggle about whether Australia should encourage and do its fair share in an effective global effort to reduce the dangers of climate change. It's a struggle over policy between special interests and the national interest. This conflict is not new. Indeed, it is always with us and always will be.

But there are periods when the special interests have had the strongest hold on policy and others in which policy making is strongly grounded in the national interest. And the difference between these periods is evident in Australian economic performance and prosperity and the outcome of this new manifestation of an old struggle will have a large effect on Australian prosperity in the years ahead.

This should be the best of times for structural change in Australia. We are close to full employment and Australian average incomes are higher than they have ever been. Our average incomes have risen above those in the United States for the first time since the early years of our Federation.

But while it is the best of times economically for structural change, the best of times for the introduction of far reaching reforms such as carbon pricing, it is - although it's the best of times economically, it is a hard time politically. And that's mostly because the resources boom has placed tremendous pressure on the non-resources sectors of the economy, including manufacturing, tourism, education and some areas of farming.

Some parts of farming have had their own commodities boom driven by some of the same factors - very strong growth in demand in the successful, big developing countries. Wool has recently joined that, but there are other areas of the farm sector that's missed out from those price effects. So like manufacturing, tourism and education, it's feeling downward pressure from the resources boom.

The resources boom has pushed up the real exchange rate to the highest since our Federation and that is scouring out much of the other tradeable goods industries. The Governor of the Reserve Bank, Glenn Stevens, made it clear in a speech in Melbourne in January and on other occasions that monetary policy has to be tightened to the extent necessary to release labour and other inputs to production in the rest of the economy for non-inflationary expansion of resources and related sectors.

Higher interest rates take the exchange rate higher and the deliberate purpose of raising interest rates and raising the exchange rates is to shed labour and shed investment in other parts of the economy so that you can have the resources boom without inflation. The non-

resources export and import competing industries have to frank, at least in relative terms, to make way for the resources boom.

Over recent weeks and months, anxieties about employment in manufacturing that have been triggered by pressures from the resources boom have been used to raise doubts about carbon pricing. And I'd written this before I saw the full page ad from the coal industry in this morning's paper.

Beyond the scaremongering, the economic analysis shows that the carbon pricing proposals that I have put forward, which provide for assistance to trade exposed emissions intensive industries, will not cost any jobs in the manufacturing sector as a whole. I'm not saying no jobs will be lost in the manufacturing sector as a whole in the next few years - they will be lost because of the resources boom. I am saying, taking the manufacturing sector as a whole, jobs won't be lost because of carbon pricing.

Carbon pricing will affect employment in some individual businesses and sectors, but there is no reason to expect it to change total employment and unemployment in Australia, either upwards or downwards.

The effects on individual industries and businesses will be small and sometimes, in the opposite direction, to changes forced by the resources boom and the increase in the real exchange rate.

The proposals on carbon pricing in my final report may have a small negative effect on growth in employment in coal and gas. Those sectors are going to have growing employment but there might be a small negative effect on growth. And if they do, they will have a small positive effect in manufacturing, education and tourism.

Opportunities to sell carbon credits may cause the carbon pricing scheme to have a larger, positive effect on employment and incomes in the rural sector.

Many of the scary statements about employment that have been put out by firms and their lobbyists have falsely assumed no assistance to trade exposed emissions intensive industries. My final report proposes assistance for trade exposed industries for the first three years based on the former Carbon Pollution Reduction Scheme, but without the additional buffer for the global financial crisis.

This approach is likely to provide average assistance for trade exposed industries in excess of that required to maintain employment in trade exposed industries at economically efficient levels during the first three years.

The three years of transition allow time for the development of the institutional arrangements and data for applying a disciplined approach rigorously.

The scary statements from the lobbyists about loss of jobs from carbon pricing are commonly based on what economists call partial analysis, partial equilibrium analysis. Under partial analysis the immediate effect of carbon pricing on costs in one industry are calculated but not the benefits to that industry from associated falls in the exchange rate from competitors facing carbon constraints and from other sources.

While it may be difficult to get precise data quickly on other countries' carbon constraints there is no excuse for not working through the exchange rate and other domestic implications of policy changes. Of course, in communicating these partial modelling results, those

working for the business lobbies make no mention of increased jobs in other industries through falls in the exchange rate and through the new incentives provided by carbon pricing.

These indirect effects are important. Anything that slows investment and employment growth in coal and gas production at the height of the boom will cause the real exchange rate to be lower than it would otherwise have been. It therefore reduces the downward pressure on investment and employment in manufacturing, education, tourism, the rural sector and other trade exposed industries.

A partial approach to analysis of the effects of carbon pricing has been a feature of influential work undertaken for the business lobbies prior to the final policy decisions on the Government's Carbon Pollution Reduction Scheme in 2009.

I presume, from what we have been told of the results, that it is a feature of the recent modelling for the coal industry, although the information on the structure of the modelling that is necessary for an assessment has, so far as I know, not been made available to the public so I can't be sure.

No reputable economist would consider it appropriate to use partial rather than general equilibrium analysis to calculate the effects of a policy change on one industry, let alone on the economy as a whole.

Some economists who understand all about the difference between partial and general approaches to assessing the employment effects of policy change have been involved in the partial studies that appear prominently in the public debate.

If asked, I presume the economists involved - the economists who've worked on some of the lobbyist material - would never defend the conclusions about employment outcomes that were likely in the real world, as distinct from the particular modelling exercises that their clients have sought to insinuate from the studies.

The modelling for my 2008 review and the Treasury modelling that is being undertaken at the moment are based on general equilibrium analysis. Both take into account direct and indirect effects, including through changes in the exchange rate.

Knowing the nature of the analysis and earlier results from similar analysis, I would expect that the Treasury modelling of carbon pricing currently being undertaken, incorporating assistance for trade exposed industries, would probably show a small, positive effect on manufacturing employment. We will see.

If the coal industry is correct about the slowing of the prodigious expected growth in coal employment and fundamental doubts have been raised by others about the work, this would reduce downward pressure on the exchange rate - this would produce downward pressure - this would reduce downward pressure on the exchange rate.

The current problems of the steel industry and of tourism, education, of other manufacturing industries, come overwhelmingly from the higher real exchange rate that comes from expansion of the resources industries and a reduction of growth in coal and gas and the resulting lower real exchange rate would be a positive for them.

What is the right amount of assistance for trade exposed industries? It is the assistance that would leave an industry in the same position that it would be in if other countries had the same constraints on pricing as Australia.

If all other countries had the same cost from carbon constraints as Australia the right level of assistance would be zero. If the average of other countries was imposing greater costs from carbon constraints than Australia, the right level of assistance would be less than zero. And other countries would sooner or later probably seek to impose an additional burden on import from us.

The right level of assistance has to be calculated industry by industry. The assistance calculations are therefore a big job, requiring a good deal of analytic capacity and also data. That is why I suggested introducing the principled approach after three years of the scheme, four years from now.

The job is not a big as the one that has just been done on other countries efforts to reduce greenhouse gas emissions by the Productivity Commission. And this job was done with a tiny staff that would be expanded if the Commission were given the task of recommending independently on assistance for trade exposed and emissions intensive industries. They would have four years, instead of about seven months, for the job that was completed on 31 May this year.

Working out the economically efficient carbon pricing arrangements is not the task that has just been completed by the Productivity Commission. The work on assistance places attention not on the average of what all other countries are doing but on what is happening in the marginal producers, in those competitors who would be most likely to reduce levels of production if all countries had Australian constraints.

At this time in history, focus on the marginal producer would put most of the focus on China for many manufacturing and processing industries, including those which are slated to receive especially large amounts of assistance. Industries like aluminium, steel and cement.

The cost to Australian living standards of excessive assistance are just as large as the cost from assistance that is too low. The most important part of the carbon pricing assistance arrangements is the development of independent advisory arrangements and clear principles for determining assistance. The alternative is continuing political pressure of the kind that has been dominating the carbon pricing discussion in recent times.

The return of a rent seeking political culture over the past decade has been one cause of the collapse in productivity growth since the beginning of the current century. I talk about that at some length in my final report, which is on the web and available through Cambridge University Press.

The slump in productivity growth has been covered up by a debt funded consumption and housing boom in the early years of the century and then by the resources boom. There will be no covering up after the inevitable end of the resources boom. We will need all of the productivity growth that we can get and we will get much more if a market approach is the central element of our necessary efforts to reduce greenhouse gas emissions.

The reduction of carbon pricing - the rejection of carbon pricing, if that is the end of the - end point of the current debate, won't end the debate on climate change policy. And I note that neither major political party is advocating doing nothing about climate change. The Opposition's policy is to reduce emissions by five per cent on 2005 levels by 2020 but to achieve that result through regulatory actions or direct action.

The task is actually, Lord Mayor, not such a small one. I hope we'll get ourselves in a position to do more. But business as usual for Australia would be, on the last calculations late last year, an increase of 24 per cent. So we're looking at a 30 per cent reduction from business as usual. And since then we've had announcements on several new natural gas and other liquefaction projects that would substantially increase business as usual emissions.

So the task is a big one. The question is, do we get there through carbon pricing or through regulatory approaches?

So the rejection of carbon pricing won't end the debate on climate change policy. It might, however, end the possibility of action at relatively low cost. The increasing impact of climate change itself and overseas policy developments would prompt continued pressure for new policy in Australia if we dropped carbon pricing now.

Inaction by Australia would invite retaliation in trade and other areas of international cooperation. Debate would continue over how much Australia should do and how we should do it. This uncertainty would raise the supply price of investment in business.

The political system would respond to continued community interest in climate change action by myriad costly interventions. Amongst other things, it would lead to increasing clamour for closing down production, investment and trade in fossil fuels - especially coal. And that's not the way to do it. Carbon pricing gives you a structured way of doing it and gives the fossil fuel industry a chance to develop the technologies, like sequestration of waste that would allow them a future in a carbon constrained world.

Without carbon pricing, economic rationalists like me would not be able to raise an argument against a clamour for direct action against the fossil fuels industries. The failure of current efforts would lead to a long period of incoherence and instability.

Well, just a few words expanding on what the Lord Mayor said about the evidence on climate change. My very detailed modelling of the costs and benefits of climate change for the 2008 review - and the presumption was that Australia would do its fair share in a global effort, no more and no less - and that showed that it was very much worth Australia's while doing its fair share, although there were costs.

That analysis also showed that Australia would be damaged more by climate change than any other developed country. I set out the reasons for that in the 2008 review. We've done well from the high carbon global economy, within which we have lived for most of our economic history. We have the human and natural resources to do extremely well in the low carbon global economy of the future.

That's because we have exceptional natural endowments of all of the lower and low emissions energy resources. Of them, gas is a very important transitional fuel - maybe more than transitional if sequestration of waste is successful - solar; wind; wave; geothermal; nuclear; even hydro through our proximity to the island of New Guinea, which has some of the richest hydro resources in the world.

Exceptional opportunities for bio-sequestration and geo-sequestration are present in Australia. We have the skills and professional services that will be the key to a shift to a low carbon economy: skills in engineering, project management; all the skills we've developed for a rich and successful resources sector, mining sector. They will be valuable skills in the transition to a low carbon economy.

In the final report, I talked a fair bit about the importance of Australia doing its fair share in a global effort and on - I talked a fair bit about how we should calculate our fair share. I think we can say that right now, with business as usual or business as usual incorporating current policy, incorporating the renewable energy target, the solar incentives, and all current policy, has us running towards a 24 per cent increase, now more than 24 per cent by 2020. Well, there's no other developed country with that sort of profile. I don't think anyone can say we doing our fair share now.

We've committed to an unconditional five per cent reduction in emissions over 2000 levels by 2020. As I've mentioned, that target has bipartisan support. We stand out for the modesty of our target and also for the yawning gap that lies between it and the current emissions trajectory. But whether we're aiming for five per cent or something more ambitious, there's a very important question of how we get there and that, of course, is the debate between carbon pricing and regulation.

It's been common for some commentators over recent weeks and months to argue that because neither the United States nor China have a carbon price, nor should we have one. The claim is that carbon pricing would amount to Australia getting ahead of the world.

Well, we're not getting ahead of the world. We're not getting ahead of the United States and China on measures to reduce emissions below where they otherwise would be. And if we choose to reduce emissions - to do our fair share, a mechanism that has relatively low costs - that will put us in front of the world in minimising the costs but won't put us in front of the world in reducing our emissions. It will only mean that we are playing our part more efficiently with a much lighter impact on the Australian standard of living.

My American economist friend, Jagdish Bhagwati at Columbia University in New York, used to say about trade negotiations - they end up having two sides shouting at each other: I won't keep shooting myself in the foot unless you stop shooting yourself in the foot. Well that's the nature of this debate. If we say we won't adopt a low cost means of reducing our emissions unless you do, we are really promising to keep shooting ourselves in the foot as long as China and America are shooting themselves in the foot.

In my final report, I talk quite a lot about the several ways in which regulation - although the costs are hidden - ends up being a relatively expensive way of reducing emissions. I won't go into that now. Just briefly on the scheme, I've suggested a carbon pricing scheme should start in the middle of next year, initially with a fixed price, operating like an emissions trading scheme right from the beginning. But in the first three years I'm suggesting that the regulatory authorities - which I say should be an independent regulator, an independent bank of carbon - should sell permits at a fixed price to allow the arrangements to settle down.

We'll obviously begin with a fair bit of political uncertainty. A floating price - a market price - would be a fluctuating one, maybe moving up and down with every opinion poll. Well, we avoid that with three years of fixed price and then I think the conditions will be ready; conditions that include opportunities for international trading permits to move towards a floating price.

One of the many advantages of carbon pricing over regulation is that it generates quite a lot of revenue for the Government which can be used to reduce other taxes. And if you're reducing - if you're raising carbon tax and reducing income tax, you are raising the efficiency of

the economy. Work by Professor Nordhaus at Yale a long time ago showed that if you used the revenue from a carbon tax to reduce income tax you're substituting a less distorting tax for a more distorting tax. The labour participation response, as another response, would mean you'd get a gain from that even if you weren't worried about the greenhouse gas effects.

In the discussions before this lunch I was pleased to meet a member of the staff of the City of Sydney who had been in British Columbia when they introduced a carbon tax explicitly for that purpose, to reduce income tax. And they got a substantial benefit from that independently of the gains that come from reducing greenhouse gas emissions. So I'd like a fair bit of the revenue to be used for that purpose and also for adjusting social security for low-income households that won't benefit from the tax cuts.

With regulation you impose costs. The renewable energy target imposes costs but there's no revenue to cut taxes or to adjust social security benefits. So not only is the direct cost more but there's no revenue to compensate.

I suggest that in the early part of the scheme, the first few years, about thirty per cent of revenue go to assist trade exposed and emissions intensive industries. With a disciplined approach I suspect that will decline over time but I'd let an independent authority work out what's appropriate. Again, renewable energy target lifts costs but there's no revenue to provide assistance for businesses that are trade exposed.

I'm suggesting that substantial funds be made available for innovation in low emissions technologies. You will never get enough innovation, even with the carbon prices you'll not get enough innovation to get an economically efficient transition without recognition that the innovator, the first firms to do some new thing is generating knowledge that the whole community benefits from.

We'll be spending money to generate benefits for others. To get enough of that type of activity you need to provide some additional support for the innovators. And I'm suggesting that over a number of years we move towards \$2.5 billion dollars a year being provided for innovation. And I'm also suggesting that substantial revenues be used for bio-sequestration in the land sector.

Good governance is going to be critical to the stability and credibility of the scheme and the efficiency. As soon as the parameters of the scheme are settled, business will focus on making money within the new rules rather than on securing rules that make them money.

That makes it essential that the rules really are settled. And I think it will be much more likely the rules are settled if we have an independent regulator - an independent carbon bank - to regulate the scheme; if we have an independent climate committee to advise on targets and the transition to a floating price regime; and an independent agency to advise on assistance to trade-exposed industries.

In each case there will be ultimate authority lying with the Parliament, but as with other well established independent bodies in Australia, governments would need good reason to overthrow the advice of an independent authority.

If the multi-party committee reaches agreement in the deliberations that are currently very active, then we'll have an announcement early in the new financial year about the proposed arrangements. We'll probably have legislation later this year. We'll probably have a scheme coming into effect in the middle of next year and everything

changes then. Scaremongering won't matter anymore; people will be able to see what's actually happening and judge for themselves. They'll have their tax cuts or adjustments to social security. There'll be some increases in electricity prices; they'll be able to weigh that up.

Trade-exposed industries will see that they are being substantially assisted. They may still be worried about the effects of the resources boom and that might be threatening to them, but that will be more clearly a separate question. And we will have embarked on an exciting transition to a low emissions economy. The story of carbon pricing from then on will be the story of innovation.

Where will the reduction in emissions come from? Well, they'll come from everywhere. We had the same sort of question when we reduced emissions. When we reduced protection, I was very active in that debate and the question in meetings like this was always, yes but if we reduce protection we lose twenty thousand jobs in making cars or making underpants, so where will the jobs come from? Where will those jobs come from to avoid unemployment?

And the economist answer used to be my answer at the time, well we'll have a more competitive economy, we'll be spreading the adjustment across the economy, there'll be incentives for new activities. The jobs will come from everywhere. And that wasn't a very convincing answer at the time but we now know that the jobs came from everywhere, millions of them. And the adjustment to removal of protection involved a lot of structural change but it didn't involve unemployment. And so it will be with the reduction of emissions under the market-based scheme that I propose.

Other city councils will see how effective Sydney has been in transition to much lower emissions energy and will find that they can save quite a lot of money if they do something similar. You'll get lots of people coming here, Lord Mayor, wanting to understand how you've done it.

Consumers will use less energy and other goods and services that embody high levels of emissions - that will happen in every household. Natural gas exporters will try harder to find opportunities to capture fugitive emissions and to capture the waste from liquefaction. Land owners will think hard about the part of their properties that would have more value as carbon sinks than they do carrying sheep.

Lots of people with clever ideas for doing things in ways that reduce emissions will find equity investors and lenders more interested than they were before. Every producer will think about whether it's more profitable to spend a bit to reduce emissions or to buy more permits. Millions of Australians will set to work to find cheaper ways of meeting their requirements and servicing markets.

We don't know in advance what the successful ideas will be, but I'm pretty sure that there will be extraordinary developments in technology and that the change will happen faster than we think.

So this is the fourth time that Australia has moved towards economy-wide carbon pricing. I think we're closer to it than we've ever been before, but we're not there yet. Each of the other times the retreat of economy-wide action did not mean the end of climate change mitigation policies. On the other occasions, an array of regulatory interventions took their place with little effect on emissions but large effects on the Australian standard of living. So it would not be the end of the costs if Australia were to seek victory to the regulatory approaches in the period ahead.

The really big cost - the biggest of costs of ceding victory to regulatory approaches - would be the entrenchment of the old political culture

that has again asserted itself after the late twentieth century period of reform; the invitation for businesses to put pressure on governments to favour this project and this business because they're doing something to reduce emissions.

Carbon pricing is an economy-wide mechanism that gets you away from that process of political preferment, which historically was very important in Australia before we - before the reform period in which we got rid of protection. We're vulnerable to a return to that political culture.

So if we reject carbon pricing today, the climate change policy debate will still be here tomorrow. But our hopes of dealing with it in a way that preserves Australian prosperity may not.

Thank you.

[Applause]

ROSS GARNAUT: There is a back on the chair.

COMPERE: We've been talking about these chairs while we're sitting at the table. They're very smart, aren't they?

[Laughter]

COMPERE: I don't know if I can vouch for their comfort, but they're very stylish, Professor Garnaut.

So now there's opportunity for you to make comment and to ask questions. And to start us off I might ask our Alan Jones to, perhaps, ask the first question. And we've got mikes circulating so please put your hand up to indicate that you'd like to say something.

ALAN JONES: Professor...

COMPERE: Please don't be shy, yes.

ALAN JONES: Professor Garnaut, will the regulatory barriers to decentralise energy be removed to enable low and zero carbon co-generation, tri-generation and renewable energy to compete with centralised energy coal-fired power generation on a level playing field as they did in the UK?

ROSS GARNAUT: Well, I'm aware of the developments in the UK led by Prime Minister, Tony Blair that facilitated development of decentralised energy - towns or municipalities or regions taking themselves off the grid. And that had a very good effect, both on reducing costs in those areas and reducing emissions, but also on smartening up the whole system.

I think here, if we facilitated the development of decentralised power it would have the same two effects. There would be opportunities to do things more efficiently, to opt out of some of the unnecessary but big costs that are associated with the current regulatory arrangements in Australia.

But I think that some places opting out would put pressure on those regulatory processes and help smarten up the rest of the system. And once the established distribution networks had that sort of competition, they'd try harder to provide electricity at an efficient price.

So I don't know if that will happen, Alan. But it will be consistent with my recommendations and I hope it does.

COMPERE: Yes, over here. If you can just say your name and perhaps where you're from it's helpful.

MATTHEW SANDER: Matthew Sander from Kinesis. Thank you for your speech, Professor, and for the invitation. A little bit following on from Alan's question just then, moving to a market-based system is going to be most efficient if when the cost comes through society people are able to respond and have options to respond.

If those options aren't available, if people can't move to different homes that are lower energy, if there's not alternative transport options, then the cost will be passed through - will be a cost rather than reduction.

I think the common line is that the emissions trading scheme gives you certainty over the outcome and not certainty over the price. But the carbon tax gives you certainty over the price and not certainty over the outcome. We won't have that certainty over the outcome unless people are able to respond.

I guess, given that we're in the city of Sydney at the moment, would you be able to talk a little bit about what some of the ways that local government, businesses and so forth can assist citizens in transferring and understanding and realising those opportunities. Because if those opportunities don't exist, then we won't get the reductions coming through.

ROSS GARNAUT: Yeah. Well, as I mentioned at the end, the reductions in emissions, once we have a carbon price, will come from everywhere. The opportunities will be very wide. Some potential means of reducing emissions at low cost require collective action.

This is true of anything that typically involves a network to provide the service, like a - or public transport is a typical network - so unless there are planning decisions that take into account the value that everyone will place on using less petrol in their car, we're not going to have much greater use of public transport.

At the margin there will be a bit, but it's only through planning decisions, investment decisions carried through into operations of trains that we can get a big transformation in transport. But there will be thousands of other ways in which people can adjust their behaviour.

Now, it would be desirable if we systematically went through all of the planning blockages so that we expanded, to the widest extent possible, the areas in which we could make these adjustments. But we do have to recognise that some are, in their nature, complicated and public transport is probably one of the most complicated.

Carbon pricing becomes one more of many reasons why Australia - Australian cities should be investing more in good public transport. But even in the transport area the most efficient solution might involve a much more efficient train system, light rail systems. But if the planning and investment history doesn't allow that, at least for a while, then the movement to an electric car will be accelerated by carbon pricing.

One of the really interesting developments in the last three years is the progress with the electric car. When I did the modelling for the 2008 review, the work was mostly done in 2007, early 2008. We put in various - we put in our best judgement about development of the technology. Well, we did this for a thousand sectors, but one of them was the car. And the result of that - those technological assumptions had about fifteen per cent of the Australian car fleet being electric cars by 2050.

Well, it's only three years since that work was done. But it would seem from development overseas in the electric car that that will turn out to be a wildly conservative estimate.

And it's very interesting how greater concern for reduction in emissions, for example in China and the United States, together with the focus of the stimulus packages in the - as a result of the financial crisis in many countries are seeking to accelerate development of electric transport, that we're getting much faster technological change than anticipated.

Well, the efficient solution might be someone being able easily to catch a light rail from Bondi to Sydney city as they once could, a couple of generations ago. But even if that can't be done, there will be electric versions of transport which, once we get the - once we reduce the fossil fuel content of our power generation will become a low emissions channel. So we're going to get adjustments through many mechanisms.

It's good for the thought to go into planning to broaden the avenues for emissions reduction as much as possible. But the fact that some are closed won't stop lots of others being there.

COMPERE:

And the fact the business community is here today is indicative that they're really interested. So, I mean, it would be wonderful if we had real leadership from government in terms of the avenues that are - that - from the opportunities that are being provided. But if we don't, I think the private sector will take the action.

Over here, yes, Simon.

SIMON MARNIE:

Hi, Simon Marnie from ABC Radio. I'm intrigued, if we're looking at three different bodies to oversee the implementation, who do you envisage will be on those three separate bodies and what will be the type of person that serves on either the authority, the regulatory board or the carbon bank?

ROSS GARNAUT:

Well, there will be different types of people. The regulatory authority is going to require the same sorts of skills as we have in other regulatory authorities, like the Competition and Consumer Commission, like in the regulation of the financial sector.

It will be issuing permits, enforcing administration of the system; it will need to take some policy judgements from time to time. So in some ways you need the balance of skills that you had in the old Reserve Bank of Australia when it was responsible for APRA as well as the policy side.

For the climate commission, you - I note what the climate committee are recommending on targets and what I've recommended is very similar to what has been working in Britain in the last few years. And they have, as chair of that committee, Lord Turner, who's actually an expert from - in the financial sector, but there are people who are deeply steeped in climate science as well.

So in the mix of skills you would want to have people who understand the economic implications of what is being proposed, people who understand the science, people who understand the international relations, because one of the most important determinants of how far we should go with our targets will be what other countries are doing and so you need good judgement about that.

For the independent body to advise on assistance, the skills you need are the sorts of skills that we already have in the Productivity Commission and in my report I've recommended that we use a body

like the Productivity Commission which could be the Productivity Commission.

COMPERE: Okay, that makes it simple. Other comments, questions? Down the back and over here, yes.

PAT FINCHAM: Hi, Pat Fincham from STS. I'm just interested in a little bit more in the debate between regulation and pricing. I think in the seventies we successfully got rid of the CFCs in relation to the ozone layer and all that business and I think that was a regulatory approach.

So is there a role in your economist's head for regulation in relation to this issue and is it a - if we needed to accelerate the change perhaps, would we at some point need to rely more on regulation to really say look, no more coal fired power stations or some other more sort of harsher intervention?

ROSS GARNAUT: Well if we've got carbon pricing and if we've got the mechanisms that I propose, then the carbon price will rise as other countries are doing more, because I'm proposing linking to the international situation and so that can drive a lot of change.

Now if we didn't have carbon pricing we'd have no choice and I think the debate would become then how soon we put in place regulatory mechanisms to phase out the use of coal and so on. But even in the best of worlds there are some things that a carbon price won't effectively manage and I've said that innovation is one of those.

The carbon price will encourage innovation, but to get enough innovation to minimise the cost of transition, we should be giving support to genuine innovation where the new activity is generating knowledge that the whole community can use. And I've suggested there use of part of the carbon revenue in a technology neutral way to encourage innovation.

Now there's some other areas which are mainly in the normal responsibilities of local government in Australia where carbon pricing won't do the whole job. I think there is a role for building regulations. There's a very big job for a provision of information by governments on what are the efficient ways of responding to the need to reduce emissions.

And the reason for regulation and special efforts to provide information is that the householder, the small business won't have the resources or the financial strength to make a big - to take time out to make a big study of what's the best thing to do and often the cheapest way of getting a good outcome is to avoid the need of everyone making their own study by building in best practice into building regulations. We do that in a number of other areas for safety and other things; we could have some of that in this area.

COMPERE: Down the back, yes.

BHAKTI DEVI: Bhakti Devi from City of Sydney Council. Because I work on the water strategy helping the city develop a decentralised water master plan I am equally interested in climate change adaptation and I would like if you've got any comments on cost of not adapting to climate change.

ROSS GARNAUT: Yes, I've got one chapter in my final report on adaptation. I say there that if we don't do something globally to reduce emissions, then we shouldn't kid ourselves that we can adapt. The science says that if we just continue purely on business as usual, don't do anything about it at all, then we could be looking at temperature increases around six degrees by the end of the century and rising above that. That means that...

COMPERE: It's devastation.

ROSS GARNAUT: ...that if a hot day used to be forty, it's forty-six. It was forty - I think it was forty-seven or forty-eight in the highest on record on the day of the terrible fires in Melbourne. Well that would be fifty-three or fifty-four, so we would just be kidding ourselves if we thought there was any easy process of adaptation.

Now on the fairly weak sort of effort the world is now making on mitigation, reduction of emissions, we may hold the temperature increase to around four degrees, which would also be pretty catastrophic. Especially when you think of the intensification of extreme weather events, the changes in rainfall plus and minus, but meaning very big changes in particular areas. So again we'd be kidding ourselves if we thought adjustment was easy.

But if we succeed in tightening up the world mitigation effort, if we succeed in what is now the global objective of holding temperature increase to two degrees, then we would still need a lot of adaptation. Two degrees is not small. All the change that's happened up till now has increased temperatures by nearly one degree, so we're less than halfway to the temperature increase we'll get even if the world is effective in that very ambitious mitigation program.

So that's going to require quite a lot of adjustment. We're going to have higher sea levels; we're going to have more extreme weather events; we're going to have big changes in precipitation in different parts of the country. So I think that's where adaptation becomes crucially important.

Now I've said that the first arm of adaptation policy has to be to do everything we can to encourage a strong global effort on mitigation because we've got to, we've got to make the adaptation task manageable by holding the temperature increase to as low a level as possible.

The second thing we need for effective adaptation is good information from the science on climate change impacts. We need a well-informed community. We need the science to be applied at a regional level so that we know more precisely what the possible or likely effects are going to be in particular regions. We need more of the models based - modelling based on the science that's recently been applied to sea level rise and the effect on coastal properties. And obviously that information has to inform planning decisions as well as household decisions on investment in housing and other activities.

And the third essential element for adaptation is an efficient flexible economy, because we can't predict exactly how the shocks will come. And so we're going to have to have a flexible economy to respond to all of that.

COMPERE: How are we going for time? It's time, it's time. It is time. One more question here and then it's time, yes. Got a mike over here? Yes.

JOHN HEPBURN: Thank you. Thanks for a very interesting presentation. Just a - given what you've just spoken about in terms of the impacts of climate change, I'm just wondering at what point do you think that the imperative for policy development should shift from being the least cost measures to most transformative or most effective measures.

And if you could talk a little bit about the - a number of different organisations have been talking about the need to shift to a war footing and using, you know, analogies of the response to the Second World War and the rise of Hitler to transform economies much more

rapidly in response to what is a very, very serious threat. John Hepburn from Greenpeace. Sorry for not introducing myself.

ROSS GARNAUT:

Yes, that's a really important question. I think whatever the community is prepared to accept in terms of transformative effort, it's best to apply that effort in the lowest cost possible way. We can, we can make carbon pricing as transformative as the political system will allow.

This adaptation policy - mitigation policy has to be a global policy. I've proposed the linking of the ambition of our targets and also our carbon price to what's happening abroad. As the global effort increases our effort will increase under my arrangements.

If the world were to accept the imperative of avoiding a two degree - anything more than a two degree increase tomorrow, to be reasonably certain of avoiding that we would have to greatly accelerate our effort. You could do that through the world tightening targets, raising the carbon price, investing more of the higher revenues that will be available in innovation for transformative purposes, so I think I would still accept the same sort of mechanisms.

Now, I am aware that there is another view, that in wartime our governments didn't just rely on taxation and market mechanisms. They banned consumption of a whole lot of things, they commandeered the use of a lot of productive capacity from the private sector to go into munitions development and development of other war supplies. The extent to which that was done varied across countries. The United States tended to rely more on market mechanisms and it was effective, but even there they had far reaching price controls and a lot of mechanisms that weren't applied elsewhere.

But we've got to make this work over a long period. This isn't four, isn't four years from Pearl Harbor to Victory Day in the Pacific; this is a hundred year effort and regulatory systems are hard to sustain over very long periods and so I would - you take account of my prejudice as an economist as much as you like, but my feeling is that even if we were going for very ambitious goals, the best way of doing it would still be through carbon pricing, supported by using a fair bit of the revenue for support for innovation.

COMPERE:

It's a sustained effort, isn't it?

ROSS GARNAUT:

Yes.

COMPERE:

It's the future. It's our lives into the future and we have to accept that.

ROSS GARNAUT:

Yes.

COMPERE:

Yes. I'd like to thank Professor Garnaut for presenting to us today. I'd like you to join with me to thank him.

- ENDS -

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