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Speaker: Ross Garnaut, Climate
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COMPERE, John Phillipmore, Curtin Institute:

I ask you to welcome Ross to the stage to hear his address, thank you.

ROSS GARNAUT:

Thanks, Ray, thanks, John, Members of Parliament, former ministers, lots of friends, my old classmate from Mt Lawley Primary and Perth Mod, Tony, who actually knows something about meteorology. When he left school he became a meteorologist, now at Curtin.

I thought today I'd just focus on a few issues rather than going over my whole report. By now many of you will have seen it on the web or seen reports of it. There are a few issues that probably need a bit of underlining given the discussion that's been going on.

I thought I'd focus on why it's in our national interest to do something about climate change, for Australia to play its fair share - to contribute its fair share to the solution to the global climate change problem. I'd like to say a little bit about what that fair share might be. We should look at measuring a fair share.

A little bit about the best way to make our contribution of a fair share, what policies are relevant, but in that context of comparable effort with others.

I thought I'd say a little bit about something of special relevance to Western Australia, the resources boom, how that's affecting the debate about carbon pricing and in particular the relationship between the resources boom and employment in other parts of the economy, because we've heard some rather wild things said about how carbon pricing will affect manufacturing employment.

Well under the proposals that I've put forward it won't. Whereas the resources boom for good or ill does force reductions of jobs in manufacturing, in universities, because universities are export industries, in tourism, in the farm sector and we should be analytically honest and actually look at cause and effect when we're talking about employment.

In that context I'd like to say a little bit about the case that's been made for exemption of natural gas in some of the Western Australian and Queensland discussion.

I had a very good meeting yesterday evening over dinner with chamber and mine and energy senior executives of nearly all the substantial mining petroleum companies who have major bases in Perth. Not Rio Tinto, but I see that my friends from Rio Tinto are here this morning. So I can catch up with them.

That was a private discussion but it just reminded me that within the resources sector the case for doing something about climate change does not resonate as strongly as in most intelligent parts of the business and wider community.

Of course, there are well-known reasons for that. On most issues where you stand depends a little bit on where you sit. It's a very natural thing for people with a very strong

interest in a particular point of view, particular set of knowledge, to come slowly to acceptance of that knowledge if it's disruptive of their interests.

I say that without making any negative point about anyone or the resources sector. It's just a natural thing and it's best for us to face up to it.

In the world as a whole, at least in the countries of good education and scientific traditions, and traditions of rationality in approach to scientific issues, there's a few propositions now that are accepted beyond reasonable doubt: that the world is warming over the last half century in particular; that human activity is a major influence in that warming and three; if we don't do something pretty urgently and pretty strongly about it, then there will be major disruption of a number of systems that are essential to our ways of life, not to put too sharp a point on it, to modern civilisation.

It's a bit hard to respect science and rationality and objective reality and not to accept those three propositions. Yet there are still parts of the Australian community that don't and my colleague at the University of Melbourne, Peter Doherty, the Nobel Laureate in medicine, talks about the general phenomenon of denial, where scientific reality leads to very unpleasant truths.

He draws a close parallel between denial of climate science, denial of the connection between immunisation and disease, denial of the connection between sexual activity and AIDS in some places where AIDS is deeply entrenched in the community.

They have similar sorts of psychological origins and we need to try to face up to the importance of the origins of denial of science, because we're not going to have an honest and good discussion unless we're understanding the realities of where people are coming from.

Once you accept the mainstream science, the science that - well, the three propositions that are overwhelmingly supported by credentialed people in climate science, people are continuing to undertake research to publish in peer reviewed journals, the science that's supported by the academies of science in all of the countries of scientific accomplishment, all of the countries that we think of as having a strong science base: Australia, United States, Britain, Canada, France, Germany, Italy, China, Russia, India, Korea, Japan, there's no exception.

So you really have to put yourself outside the group of people, who intellectually we normally like to associate ourselves with in the scientific field, to deny the three propositions that I put.

Once you accept those propositions then one still - that doesn't in itself make a case for action; you need to be able to show that the benefits of taking action exceed the costs. That was the exercise I did elaborately in the 2008 review, with a lot of modelling of the purely economic effects, the market effects of the economy.

I won't go over all that now, but when you look together at the costs and benefits of the things that work through markets that you can precisely model, look at other things as well, the case is strongly made.

It happens that that work showed that Australia is a developed country that has most to gain from playing its proportionate part, doing its fair share of an effective global effort.

Within Australia there's probably no part of the country that has a stronger interest in it than the south-west of Western Australia, Perth and the south-west, because a lot of the climate change impacts, the climate models show pretty unambiguously, will come early and strongly in southern Australia and unambiguously in the south-west of Western Australia.

So if any people in rich countries anywhere in the world have got a strong interest in making sure that their country is playing a proportionate part, doing its fair share in a strong global effort, it's Australians, and within Australia it's us Western Australians.

Then once you've made the case that we should be doing something about it, we've got an interest in an effective global effort and us playing our part in that. There are important questions about how we assess what are fair share is.

A few chapters in the original review were on this question and I've taken - I've updated that, taken that a bit further in chapters three and four of the updated review, which I've just put out and there's been some international developments that are relevant there. Certainly it wouldn't be worth Australia doing anything if we knew that no one else was doing anything at all.

That criticism of action on climate change is valid if other countries aren't doing anything. Tony Windsor, the Independent Member for New England, said a little while ago in a public forum if all the lemmings are running towards the cliff, then we might as well enjoy being one of the lemmings [laughter] and that is a rational view, if the lemmings are running towards the cliff.

But fortunately the rest of the world, most of humanity's not acting like lemmings, not running fast enough in the other direction [laughter] but there's quite a lot of things going on. And in the updated review, I talked a lot about that and particularly about two countries which come up a lot in the Australian discussion, China and the United States, as examples of other countries that aren't doing much and which justify us not doing much.

Just briefly on them, and these are not the world leaders. Europe's the world leader. Scandinavia, the four Scandinavian countries have had carbon pricing since the early nineties. Norway is the one developed country with richer endowments of fossil fuels per person than we have. Norway's had carbon pricing since the early nineties, richer in fossil fuels than we are.

Norway's emissions per person are about ten tonnes a year. Our emissions per person are about twenty seven tonnes a year. They've had different policies for two decades and it shows and it's not simply the different base of the economy. It's not simply that we're a country of fossil fuel abundance.

Then the rest of the European community developed carbon pricing through the emissions trading scheme in 2005. That's half a billion people, half the people in the developed world and they made a lot of blues to begin with but they've been tightening it up, improving it, and it has been having a substantial effects on emissions and will be having a much bigger effect in future.

But the larger European countries have gone further than that, Germany, France, Britain, mostly recently Britain just two weeks ago, just in time for me to include a reference to it in the final report [laughter]. They established a climate - they call it a climate committee - to advise on targets some time ago. Well, inconveniently in what is still a deep recession in Britain following the great crash of 2008, inconveniently the climate committee said, well, we really need to push on further and faster. We need to cut emissions by half by 2025, which goes beyond the European commitment.

There was a big debate in the British Cabinet, which took several days. The Conservative Government of David Cameron decided to accept the recommendation and that's going to become law, domestic law, in Britain. And Germany and France, two other countries with conservative governments are also moving well - or have moved well ahead of Europe.

It's interesting that in Europe there's certainly no suggestion that there's a left/right divide on this climate issue. In fact, the leadership has come more strongly from the conservative side and there are good reasons for that because what is at risk with climate change is the stability of our basic institutions, the institutions which support our civilisation. That's what conservatism is about, preserving the basic institutions that underpin our civilisation.

Lenin said famously that inflation is our great ally. It would destabilise the capitalist countries. It's logical for a radical to take a big risk with climate change because that will break things up and you never know which way the cards will fall and that will create opportunity. It's irrational for a conservative to play with the dice of climate change.

And a lot of the great contributions have been made by conservatives. Margaret Thatcher led the British effort on climate change. Both Margaret Thatcher and Angela Merkel personally trained in science, Angela Merkel deeply so but they've been leaders of the world on that.

So to a European, the Australian debate is quite bizarre. You can't say the whole of the conservative parties but with part of the conservative parties seeking to resist action on climate change. So the leadership's there in Europe.

Just briefly on China and the United States. Four years ago China wasn't doing anything on these issues. Now it's doing a lot. Premier Wen Jiabao gave his work report to the National People's Congress in which he unveiled the main elements of the Twelfth Five Year Plan. He did that just a couple of months ago. The centrepiece of the Twelfth Five Year Plan is a major restructuring of the economy with explicit targets on big reductions in the emissions intensity of GDP.

And they're doing it. They're doing it through regulatory means, pretty rough and ready means that would not be acceptable in our political system. They're also economically inefficient so I wouldn't want us to try to use them but you've got officials going round measuring emissions intensity of an aluminium plant or a steel mill or a cement plant or an electricity generator.

If they exceed certain thresholds, they jack up the price of electricity for highly emissions intensive generators, thirty-nine dollars a tonne of carbon dioxide equivalent added to the normal electricity price and if they haven't cleaned up their act within a certain period of time, they're closed.

Also very large subsidies to the whole range of low emissions energy, to development of nuclear, solar, wind, biomass. Still Chinese growth is so strong that for some time there'll be growth in total emissions but the emissions intensity is coming down rapidly and it's crucially important that China brings that to a peak and brings absolute emissions down when their average emissions - when their emissions per person reach the average - the falling average emissions per person of the developed countries. That's an idea that I put into the final report.

In the United States, the Obama Administration committed itself in the international meeting in Cancun to reducing emissions by seventeen per cent on 2005 levels by 2020. We use a base of 2000. If you use that base in the United States, the commitment amounts to minus sixteen per cent. The Obama Administration is deeply committed to action.

If you listened to the State of the Union speech in January or read it, the biggest theme of the State of the Union this year was the need for America to catch up in the transition to a clean economy, declare the goal of increasing the proportion of electricity coming from clean energy to eighty per cent by 2035.

Obama said "this is our Sputnik moment". He drew attention to the rapid progress being made in China and India, and said that it's time to get all of our great young brains working on this question. If teams of engineers and scientists got top projects, then we will fund the Apollo projects of our time, and the Apollo projects of our time will be about development of clean energy. He said in that speech that the transition to clean energy will do three things: it will enhance security, it will make our planet secure and it will generate a lot of jobs.

The United States Government has been blocked from introducing carbon pricing because it doesn't have control of both Houses of Congress. There have been bills through the Senate but not the House of Representatives, but the fact is that they recognise that carbon pricing will be a cheap way of doing it.

They've given up on the cheap way and say, "well okay we'll do it the expensive way through regulation", and so the Environmental Protection Agency has introduced much tighter emissions standards for cars, for buildings, for generators.

You've also got proliferation of regulations reducing emissions at the State level. You've got the introduction of emissions trading schemes in some regions. California is due to

introduce one due to the work of former Republican Governor Schwarzenegger. That will come in supported by the new Democrat Administration. That will come in on 1 January.

So bits and pieces, a bit arbitrary but a very strong commitment to reaching that goal. Helped a bit in the United States by a fortuitous development, what they call the gas revolution, the emergence of much larger reserves of gas through new technologies related to extraction of shale gas which will allow more rapid closing down of coal fired generation and replacement by gas.

But certainly those countries, China and the United States, are taking a good deal of action.

Well in this world where we're doing things in different ways how do we measure whether we're doing our fair share? The way the international community has been looking at that is – and this has evolved gradually and it's become clearer at Cancun in December, the United Nations Framework Convention on Climate Change meeting, is to look at absolute reductions in emissions, as a percentage of some base year for developed countries and reductions in emissions intensity of production for developing countries.

And I've added what I think is a necessary element if we're going to reach strong mitigation goals and I'm trying to make this part of the discussion of these things internationally. There needs to be very clearly defined transition from developing to developed countries with developing countries once they've reached the per capita emissions of developed countries to come down absolutely with them. China will be a relatively early candidate for that.

Well if you look at fair shares in that way we stand out for the modesty of our ambition with the unconditional target of reducing emissions by five per cent by 2020. That actually came out of my 2008 report.

It was what I recommended in the circumstance where the rest of the world wasn't doing anything. I said that in those circumstances we should, as our contribution to keeping the possibility of international action alive, make that commitment and I suggested that if the world was taking stronger action we should be doing more, but we stand out for the modesty of our ambition.

When you look closely we stand out more in another way. Of all the developed countries we're the one that at the moment looks least likely to meet that ambition. The work that was done by the Department of Climate Change in January shows not under business as usual but with all the existing policies in place the mandatory renewable energy target, all the solar programs, all of those existing policies, business as usual will take us to plus twenty-four – not business as usual, policy as established now will take us to plus twenty-four per cent by 2020.

Well there's no other developed country blowing out like that and not only that but since that work was done we've had several major new gas liquefaction projects announced which would take that number higher if we were doing it now.

So pretty clear that if you hear someone say - some Australians say I'm worried about carbon pricing, I'm worried that Australia might get ahead of the rest of the world, assure them that they have nothing to fear.

Early in my update work I played around with the idea of other ways of looking at comparable effort and in particular looking at comparable carbon prices, and right from the early stages of the international discussion of these issues it's been accepted that each country should be free to go about mitigation through its own policies, to choose its own path and so we're not going to have carbon pricing in all countries.

It happens to be the low cost way of getting there but if some countries want to shoot themselves in the foot by doing things an expensive way they should be free to do it. And so we can't compare explicit carbon prices but I did play around with the thought of whether we could calculate implicit carbon prices, converting what people are doing into an implicit carbon price, and it's clear that the closer you look at that the harder that looks.

So its hard to calculate because there are so many different measures – policies that are introduced. Even in Australia there are hundreds of different policies that are mitigation policies.

It's also very difficult because policies that reduce emissions often have multiple motives. Take President Obama's State of the Union address; an ambitious target for clean energy will be important for American security to say – to protect the planet and for jobs, and when you get a policy like that you say that's one third a climate change policy and one third a jobs policy and one third a national security policy.

There's actually no conceptual way of dividing that up. What matters is the reduction in emissions and so that drives you back to comparing effort by looking at what is actually happening to emissions, and the Productivity Commission in the paper that Gary Banks, the chairman, put out some time ago pointed to some of the conceptual complications too.

The results you get from looking at the effect of the producer subsidy side of the equation can be different from the consumer taxation side and that makes it harder to bring things together as a single price. And there's another complication of using price to measure comparable effort, and that is that you can do things that are very expensive but do very little to reduce emissions.

I think that photovoltaic has a great future but the way we've done it in Australia has been very expensive. If you actually count the cost of a program then that might put us up fairly high in terms of effort but in terms of the actual effect on emissions it's fairly low and again what matters is the effect on emissions.

So we don't want to give countries credit for a lot of expensive action that's not reducing emissions. Now I know of one big program in China that actually doesn't reduce emissions at all but it's very expensive. If you're measuring as the price on carbon, the actual cost of it, then that would rate high.

Similarly biofuels in the United States and Europe have very little impact on emissions - enormously expensive and so their measure would rate high if you're just measuring the cost and comparing things in that way.

So you keep getting driven back to comparison of what's actually happening in emissions and that's what I use in the report, and there's no way you can look at the current Australian effort or the current Australian ambition without recognising that we're a long way short of doing our fair share.

We're not even doing our fair share compared with a number of developing countries. If it's in our national interests that the world gets it act together, then it's in our national interest to do our fair share.

I'm not advocating Australia taking a lead on anything. I think the chance for that was lost many years ago, but I think it's a reasonable ambition that we catch up, that we do our fair share.

One hears sometimes an argument that even if this is a problem of considerable consequence and even if it is in Australia's national interest for the world to get on top of it that Australia is an inconsequential country. Australia doesn't matter, so we might as well save our money. If others are doing something, well we might as well free ride on them and if others aren't doing anything, well we're back in the position that Tony Windsor was talking about, lemmings running over the cliff and again, there's no point in wasting our money.

Well, I think it does matter what Australia does. So I don't think we are a trivial, unimportant, inconsequential country. There are quite a few things in which we've exercised significant influence internationally and on this particular issue every country is looking over its shoulder at what others are doing. If the developed country with the highest per capita emissions in the world, Australia, at the moment with just about the highest average incomes in the world with high terms of trade is not pulling its weight, then that is an issue in other countries.

The American Ambassador to Australia and several of the senior American officials reporting on these issues to the president stressed with me that I should not underestimate how our success or failure with carbon pricing will feed back into the American debate. I'm not saying we determine things, but if we drag well behind, then we certainly will discourage the global effort.

Even if that were not the case, would we be really comfortable about just free riding on others? Taking action, which is not very easy anywhere, and which we're the main beneficiary. Well, the whole world's a beneficiary, but the country that stands to lose most in all the developed world through unmitigated climate change - are we really comfortable about free riding?

If we applied that sort of calculus, what would we say about the First World War? You can't say that those sixty thousand Australian dead determined the outcome of the war. Would we be really comfortable about saying "okay, we'll save those men and that money"?

That's not how we look at our role in international affairs. We think - when we've got a shared international interest with others, we think about doing our fair share and I - in interaction with lots of Australians, I don't find great comfort with the idea that we should deliberately free ride on others, just take the benefits of what they're doing, even if we're not critical.

There are a lot of other countries that aren't much bigger than us as emitters who obviously are influencing the international effort. I've already mentioned Norway. Well, Norway's emissions are nought point one three per cent of global emissions and yet it's played a significant role in the international discussions, including making a big contribution to how developing countries are facing up to this issue. Including, for example, in Indonesian forestry.

And Britain - we're one point five per cent of world emissions. Britain is one point seven - with three times as many people, but emissions only about as big as us. Britain's played a big role in global thinking about this. The role of Margaret Thatcher and putting it on the global agenda. Britain's role when the European Emissions Trading Scheme was developed, the Stern Report and what that did to global thinking.

So the fact that we're one point five per cent of global emissions doesn't make us a trivial country anymore than it makes Britain a trivial country or Norway a trivial country.

Finally, a very large part of my report is about the case for carbon pricing as distinct from regulation and explaining my proposals for making carbon pricing work. I won't go through that now, but I would like to say just a little bit while I'm here in my home state about the interaction between the resources boom and the carbon pricing issue.

This should be the best of times for structural change in Australia. The Governor of the Reserve Bank, Glenn Stevens, in January gave a speech in Melbourne in which he said exactly that: now is a good time for structural change. Australian average incomes are higher than they've ever been. The terms of trade effect on incomes is extraordinary. Average Australian incomes measured in international currency are about a quarter higher than average American incomes at the moment.

We started life as a country with the highest per capita incomes in the world. Due to our clogged up political culture, the domination of economic policy by vested interests through the first eight decades of last century, we became a protectionist country and fell down the world ladder - league ladder - and by the early eighties we were - our income was about eighty per cent of the United States.

Well with the resources boom, we've soared ahead and our average incomes are very high now. That should be a good time for structural change. We've got full employment and very high incomes. The rest of the developed world's got high unemployment and low incomes and they're getting on with the job.

We're in a circumstance where if a job's lost in one industry, that takes pressure off other industries. While that's - while it is the best of times for structural change, as Governor

Stevens said, it's also a hard time politically because the resources boom has placed huge pressure on other industries.

At a nominal exchange rate of a dollar seven or a dollar eight, whatever it was last night, and a real exchange rate the highest it's been since Federation. When you look at the nominal exchange rate and what's happened to relative inflation rates, the real cost level in Australia relative to other countries is the highest since Federation.

That is clearly the other side of the coin to the prosperity from the resources boom, the other side of the coin to the exceptional incomes. That's just scouring out all of the other tradable goods industries. Putting huge pressure on manufacturing, putting huge pressure on the universities, which are a big export industry. Putting huge pressure on the tourism industry, putting huge pressure on those parts of farming that aren't benefiting from exceptionally high prices. Fortunately, some parts of farming are having a bit of a resources boom of their own, but some parts aren't.

Glenn Stevens made it quite clear that monetary policy would be run deliberately to squeeze out jobs and investment - to reduce jobs and investment and the rest of the economy as the resource sector expanded. He said we will keep raising interest rates to reduce employment and investment in the rest of the economy so that the resource sector can get the resources it needs without inflationary pressures.

As a result, manufacturing is shrinking and will shrink. The carbon pricing proposals that I have put forward will not cost any manufacturing jobs. That comes out of the economic analysis. Bear in mind, the accompaniment of the carbon pricing with some assistance for trade exposed industries. And yet, in the public debate, much is made of the pressure on the manufacturing sector.

Well, I think we need a bit of honesty here and a bit of analytic clarity. There is pressure on all the other tradable goods industries, pressure like there never has been before. But it's pressure coming from the resources boom, from the exceptional real exchange rate and that's the other side of the coin to our exceptional prosperity at the moment.

The pressure that's there at the moment obviously isn't the result of carbon pricing, because there's not any carbon pricing, but nevertheless, somehow in the public debate that's being brought to account and the measures that I'm proposing won't put pressure on those industries.

I think it's really important that we understand the source of the pressures outside the resources sector. It's a product of the resources boom. There is real stress. It's not caused by the prospect of carbon pricing.

Well, I might leave it there, Ray, and I'm very happy to - I'll just make a few final remarks and then happy to range over the whole range of issues in my report. One thought I'll leave you with at this stage of proceedings, is that if Australia, on this fourth occasion when it's been seriously debating carbon pricing, backs away from it again, the issue won't go away. We'll still be debating carbon pricing. The climate change policy issue will still be with us but the chance of dealing with it at relatively low cost may not still be with us.

The next stage of debate will, I fear, be a reversion to a focus on regulatory arrangements which are much more expensive. Every emissions intensive project will become controversial, they'll be debated one by one and it will end up doing substantial damage to the Australian standard of living.

So we've got very good reasons in terms of preserving our current prosperity to do our fair share in a low cost way through carbon pricing.

[applause]

COMPERE:

Thanks Professor Garnaut. So there are two roving microphones and we've already got our first question here. So number one from Janice Dudley.

JANICE DUDLEY: Firstly, Professor Garnaut, thank you very much for your presentation this morning but also thank you very much for your ongoing work and the rigour with which you've been contributing to the debate.

[applause]

My question concerns the relationship between renewables and the very deeply entrenched commitment and understanding, it seems to me, within the electricity generating sector, that renewables don't really have a role in contributing to "base load power" and that the only solution to base load power in a low carbon economy is nuclear fuel.

You've always recommended research and commitment to renewables and so I'd be interested in your comments on the - what I think to be a deeply entrenched view that nuclear is "the only answer" and also what you think can be done about engaging with that deeply entrenched position. A small question.

[laughter]

ROSS GARNAUT: I might start with the easy part, nuclear. Nuclear has got a very big role in the global effort. For the foreseeable future, if we use economic criteria, it doesn't have a big role in Australia, and that comes out of transport economics.

We are the biggest supplier of high grade uranium oxide to north east Asia, Japan, China, Korea, Taiwan. We're the largest supplier of natural gas to north east Asia. They use both for electricity. If we're supplying both and, say these were the only two sources of power there or here, then the cost of uranium oxide in north east Asia is roughly the same as in Australia, the transport costs are very low.

The costs of natural gas in north east Asia are very high compared with Australia because you lose so much energy in liquefaction and transport, the cost of transport, so much capital in liquefaction and transport and then gasification at the other end of the process.

So the costs of the raw material for uranium are going to be similar in both places but they're going to be much cheaper in Australia, if economic factors are working. So I think that nuclear does have a big role globally, Australia has a big role in that as the country that happens to have the largest reserves and resources of high grade uranium oxide. On economic grounds, we wouldn't be seeing nuclear developments in Australia for quite a long time.

Just a little bit about nuclear globally. In the developed countries, nuclear has run into a lot of trouble with acceptability to communities. The Obama administration, as part of its climate change policies, tried very hard to stoke up interest in nuclear, committed to giving government guaranteed loans to nuclear projects, various subsidies. There still hasn't been a new nuclear project given rights for construction since 1977. So it's tough work; even with all that government support, nothing's coming through.

You've read recently about the problems in Germany with very strong resistance even to maintaining the existing nuclear strength. Easier in France, and in Japan, they were gearing up for a larger nuclear program but Fukushima has put all of that into reverse. The Fukushima result - well, tragedy - has had a big effect on thinking in all developed countries.

In this recent phase of renewed interest in nuclear for climate change reasons, it's been the developing countries which have had the strongest focus on it. Most importantly China but to some extent India. China has been seeing nuclear, especially in the coastal provinces where you've got weaker endowments of other energy resources and where you've got a concentration of a very high proportion of the industrial activity, nuclear is playing a big role. They've been bringing on new plants steadily at a rapid rate. Most of the world's new capacity is being put in in China.

They've found that that's been bringing down the cost. For the first time in history, nuclear plants are effectively being put on an assembly line in China instead of groups of engineers being brought together to build a particular plant and then dispersed and then a few years later you build another one in another place. They're just building them

continuously and they're finding the costs are falling much more rapidly than they anticipated.

When I was there in January, I was given briefings that showed that on current trends, and they expected those trends to continue, within about five years, nuclear in coastal China would be competitive with coal, without subsidy for plants that are going in now get some elements of subsidy.

Now they, like everyone else, have had to take stock after Fukushima. I spoke to Zhou Shengxian, the Chinese minister responsible for energy and the environment in Melbourne in March and he said that they were letting all projects that had been approved, go ahead. But they were not giving approval for new projects until they'd studied the implications of Fukushima.

If you ask me for my assessment, I would expect them to tighten up safety regulations to make sure they're not vulnerable to what happened at Fukushima and then continue the program. So I think the most likely outcome is for them to continue strongly.

It is much easier for the world to deal with this climate change problem if the rapidly growing developing countries have big nuclear programs. So from a climate change point of view I hope that that is the outcome. A long answer on nuclear.

Renewables, it depends a lot on your transmission infrastructure whether you can easily handle the intermittency of renewables. So in Australia, we could handle things much more easily if we had a genuine national grid. Amongst other things that would allow our big hunks of hydro capacity in Tasmania and the Snowy Mountains to play a bigger role in balancing intermittency when the wind is blowing and the demand is not there at three o'clock in the morning, where you pump water uphill and pump it down through the generators at peak demand.

So we need a better national grid. In the United States and China, huge efforts are being put into what they just call smart grids which can deal with much greater flexibility to variations in demand. Everywhere there's a lot of investment going on in storage of different kinds and that will eventually reduce the costs of intermittency.

COMPERE:

Sally Talbot and Peter Newman, and then over to you...

SALLY TALBOT:

Thank you, Sally Talbot. I'm WA's Shadow Minister for Environment and Climate Change. Professor Garnaut, I want to add to the previous questioner's thanks. You've been one of the solid, consistent voices of reason on this issue, and I think Australia will pay tribute to you when we write the history of this time, which will not be an entirely glorious one I think in many respects.

Professor Garnaut, I wanted to do two things. I wanted to give you the chance to make a comment about the Cate Blanchett - the reaction to the Cate Blanchett, because I'm sure you've been dying to do that. So I wanted to give you the opportunity to do that.

[laughter]

Because it did strike me as being the most amazing piece of hypocrisy that the conservative side of politics has come up with such vitriol against the ad when we saw some of the richest people in Australia leading a campaign just a year ago against the mining tax without that same comment being made.

Look, I'm particularly interested in the way that you've talked about the manufacturing sector. Those of us with an interest in the continued growth of the manufacturing sector and reversing the decline, and that would include the majority of people on the left of politics in this country, are very concerned about the historical lack of courage of venture capital into these very expensive, but very important projects that will see us into a new economy.

And I wondered if, after you've commented on Cate Blanchett, you'd like to make some remarks about the role of federal and state governments and I'm obviously particularly in state government, in contributing, in helping that capital into these new areas of investment.

ROSS GARNAUT: Well, Cate can look after herself.

[laughter]

I think over time she'll give back as much as she gets. A very attractive figure in every way and I'm glad that she's using her democratic freedom to express her views on this question.

On the manufacturing sector, well this is just a very tough time. This real exchange rate is something we've never seen before. And ordinary manufacturing doesn't survive in this environment. This very high real exchange rate will recede as the resources boom recedes.

One of the challenges we face is that we'll have some difficulties if we've scoured out too much of the tradable goods industries, universities, tourism, farm sector as well as manufacturing so that we don't have an adequate base when the resource boom and the exchange rate with it recede.

In some ways it's a little bit too late to deal with that. I've been saying since 2005, since the resources boom first appeared. Because of my work on China, I foreshadowed it before others. I've been saying since then we should have been running much bigger budget surpluses all that time to take pressure off the exchange rate. But - for all that time, except for during the global financial crisis where it was appropriate to stimulate employment.

Given the situation we are in now, I think we need to recognise that it's only going to be very high brand manufacturing activity or activity which has a special advantage locationally. Some processing of minerals is so closely linked to the mining, such big advantages in processing near the minerals that we'll do that even if our costs in the processing itself are relatively high.

Generally, the parts of manufacturing that are more likely to survive and where we should be putting our current efforts are those where there are special skills involved, where Australia has an opportunity to develop comparative advantage in specialist areas. And the main industry policy tool then becomes education and training.

COMPERE: Peter Newman had a question and then we had a question down the back.

PETER NEWMAN: Peter Newman from Curtin University. Thank you also from our perspective, the kind of work you've done. I wanted to know about how these countries like the UK and Germany and Norway manage the fear campaigns that are generated by the resource sector and shock jock media. They seem to do that in a way that we can't. How did they do it?

ROSS GARNAUT: Well, I'm not conceding defeat to the shock jocks. Still battling on Peter and we'll see how this one turns out. I think there's a strong base of interest in doing something serious about climate change and something officially in climate change.

I think the shock jocks who are leading the resistance are looking more and more strident, more and more - seen by mainstream Australians more and more as being on the edge. But we'll see, this debate's got a long way to play.

But there is some difference between political culture and media culture in continental Europe and Australia. There's a difference between political culture here now and during the reform period. I talk about this in some length in the final report because I think it's a crucial thing.

I don't think we would have got rid of all of the protection and the anti-productive behaviour and regulation of Australia between 1983 and the end of the century if we had today's political culture. I say in the book that we've reverted to the pre-reform political culture of the policy process dominated by vested interests, as it was in the period where our productivity performance was the worst in the world in the first eight decades of our federation.

In the nineties we were the best in the world. The change in policy and political culture showed. Well we reverted from about 2001 to the old political culture, tremendously important.

I think the shock jock phenomenon has gone further recently. It's important in our political culture. It does place constraints on rationality and policy making. It will affect Australia's economic performance as well as performance in other areas of policy in future.

I think that if the - what I call the independent centre of the Australian community, people who are interested in the future of the country, interested in the national interest, win this one, then I think that that might be a bit of a turning point in the wider questions of political culture to which you've alluded and which are a problem for our country.

[applause]

COMPERE: ...gas issue at some stage. The gas issue which you raised...

SAM NELSON: Hello. My name is Sam Nelson and I'm asking a question that's regard - I've heard anecdotally that Australian economic modelling is skewed a bit conservatively due to problems with information gathering.

The reason I'm asking that question is my company, Greenbase, is involved with collating a significant fraction of the resources industries' information on behalf of various regulatory programs for the government.

I've seen a real disjunct in the way that information is collected. It's gone from voluntary to very high granularity under the ABARES fuel and energy surveys that I was involved in collecting, to something that's very universal, but a very low granularity.

I just wanted to first of all confirm if the rumour is correct that large conservative factors are used in Australian economic modelling due to problems with information gathering. And also maybe what informations are underway to synchronise the regulators that are collecting this information with the policy makers and economic modellers such as yourself that are using the information.

ROSS GARNAUT: Well I like to think that Australian economic modelling is pretty state of the art.

[laughter]

Not that I'm a specialist modeller myself, but I interact a lot with the people who run the big models of the Australian economy.

No, I don't think there is a general problem. Economic modelling has to be conservative, especially the sort of exercise I did looking forward at costs and benefits of climate change mitigation to the end of the century. You're making assumptions about thousands of technological relationships a long way into the future.

I did put into that modelling relatively conservative assumptions. I did that for good reason. I didn't want to take great leaps of faith. For example, the modelling assumed that - well the outcome of the modelling which had steady, slow improvements in known technologies - it had about fifteen per cent of motor vehicles in Australia in 2050 being electric.

Well given what is happening in the United States, Japan, China, and Europe, that fifteen per cent is going to come much earlier than that. I'd be surprised if we're not beyond that, way beyond that in the 2020s, and that's because once the scale starts to increase the technological improvement in the major countries that are developing these new technologies proceeds more rapidly.

But in the nature of things you can't predict that, and I wasn't comfortable about assuming in the models things that you can't be very certain about.

I think the important thing there is that you're just aware of the fact that you're not allowing for the technological breakthroughs that are actually quite likely to happen, but you don't know where they will happen or the shape of them - take knowledge of that into account.

One of the great virtues of carbon pricing is that you introduce incentives for innovation right through the economy and the adjustment to carbon pricing is going to see technological improvements right across the economy in energy efficiency, in the way households and businesses use energy, in carbon sequestration on farms, clever new ways will be found to do things. You will find in every plant some innovation to reduce emissions.

And there will be some real breakthroughs, some of the kind that we can't imagine. One can contrast the incentive being there through carbon pricing, where it's simply more profitable in any sphere of economic life to find new ways of doing things to reduce emissions with regulation or direct action where a smart minister or a smart bureaucrat has to think of something and then do it and no matter how smart the minister or the bureaucrat it's unlikely that you'll get as much, as many good ideas from that process as just providing an incentive to millions of Australians.

ALEX HYNDMAN:

Alex Hyndman, City of Fremantle. I'm seeing the global negotiations around climate change are stumbling at best and there's a risk that there's going to be countries like Australia not pulling their weight.

Do you see an argument for abandoning - well not abandoning but alternative measures to bring recalcitrant countries like Australia to the table, such as trade tariffs or some other more active measures?

ROSS GARNAUT:

Well I think that's more or less an inevitability, but frankly I don't like it. I don't like it because Australia will be a victim of it, but I also don't like it because - it's there in the Waxman-Markey legislation in the United States, so if the US had introduced an emissions trading scheme, the Administration would have been putting import barriers on countries that are judged not to be doing enough.

It's there in the post-2012 European arrangement and the problem with that sort of provision is that politics will take over and even if we were taking efforts to reduce emissions, then I'm sure when the US Congress forms a judgement on whether Australia is doing enough and the issue is whether Australian steel exports should face a tariff, then the US Congress will say oh you're not doing enough, you've got a tariff, and the politics of protection will take over.

So I'm very uncomfortable about that, but it's an inevitability with such an uneven load.

On the international effort I suggest you have a look at chapters three and four. We do have an international agreement. I think it's one that can work. It's not the one we were looking for - not as neat and tidy as the one that I proposed three years ago - but it's one that suits the United States and the big developing countries, that's why we've got it, and I think it can work.

It's based on concerted unilateral action, pledge and review, each country making its own pledge and then looking at what other countries are doing and putting pressure on those that aren't doing enough. For the time being that's the international agreement we've got and I think we can make some progress using it.

COMPERE:

...from the Chair's prerogative - you did ask, you did mention earlier about the special role of gas. Given that we're in Western Australia do you want to make some comments about that?

ROSS GARNAUT:

Yeah, I talk about this in the report because it's been prominent in the debate and the suggestion's been made that gas - and we've got two big sources of export gas now, the natural gas and the coal seam gas, mostly in Queensland and New South Wales and in South Australia yesterday I was made aware of possibilities of very substantial shale gas developments further down the track as well.

But the suggestion is made that the fugitive emissions of gas should be exempted from a domestic emissions trading scheme because gas is a low emissions fuel and it replaces coal in countries to which it's exported.

Well it is true that availability of gas from Australia and other countries does assist China, Japan, Taiwan, Korea to reduce emissions, but the gas exporters are getting a big credit

for that through increased demand for their product. It's the low emissions nature of gas that makes it a premium fuel in all of those North East Asian countries.

It's increasing demand, it's one of the causes of the gas boom and it's going to be there for a long time - that's lifting profitability, increasing incentives for investment.

Now, you can't export gas without fugitive emissions that you can either sequester - put back into the dirt - or let up into the atmosphere. In the early years of the Australian gas industry we just vented it all into the atmosphere. That's counted as part of our emissions.

Half of the growth in Australian emissions in that plus twenty four per cent I talked about is the growth of the gas and the coal industry - fugitive emissions and the carbon dioxide from combustion of gas in liquefaction. And Australians will be held to account in that. We will be - our fair share will be measured, taking into account the emissions on our soil like that and if the gas industry is not paying for permits, then other Australians will have to pay for that, either in taking extra steps to reduce emissions in other spheres or by buying permits internationally.

It's the resources boom - the boom in gas and coal - that's putting the crushing pressure on manufacturing, on universities, on tourism, on the farming sector, and if gas and coal do not buy permits for their emissions then not only does the rest of the tradable goods industry have to accept the burden of the high real exchange rate, it also will have to pay for the emissions of the gas and coal sectors.

So the gas sector is richly rewarded on the demand side for the fact that it's a low emission fuel. I can't see the case in efficiency or in equity for putting more of a burden on the rest of the economy to pay for the exceptional prosperity and expansion of gas and coal.

By putting a price on carbon and requiring gas to pay it, you do introduce incentives for sequestration and Gorgon is showing that it can be done. It will never be cheaper to sequester the fugitive emissions than just to send them up in the air like Woodside does. But a carbon price can introduce a reason for working hard to make sure you've looked at every possible opportunity for geo-sequestration.

- ENDS -

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