

Source: Climate Change Review Update 2011
Location: Darwin Entertainment Centre Studio, Darwin
Compere: Andrew Campbell
Speakers: Ross Garnaut, Climate Change Review Update 2011
Date: 6 June 2011, 6:00pm - 7:30pm
Duration: 83 minutes

Transcript:

GARY DAVIS: Good evening ladies and gentlemen. My name's Gary Davis, I'm the deputy vice-chancellor academic for Charles Darwin University. It's a great pleasure to be here this evening representing the university and welcoming you all to this public forum.

I do extend the apologies of the vice-chancellor, Professor Barney Glover. He would very much have liked to have been here to host this event personally, however he and virtually all of my senior executive colleagues at the university are at this moment preparing to participate in the CDU graduation ceremony in Alice Springs, where up to three-hundred higher education and VET students will receive their testamurs crossing the stage at the Alice Springs Convention Centre. And I've been left behind to manage here.

It's a key function - and for many the primary function - of universities to be an engine for debate and for free exchange of ideas. And we within universities are well familiar with this role and we're comfortable with informed and respectful exchanges, even on controversial matters.

Therefore the news that came out last week concerning threats made against some of Professor Garnaut's ANU colleagues and indeed the news that scientists at universities across Australia are being subjected to abusive communications, is very disconcerting.

That, however, cannot cause us to shirk our responsibilities to ensure informed engagement with the community about the big ideas and the big issues of our times. And therefore it is a particular delight for CDU to take a lead in welcoming to Darwin, Professor Ross Garnaut, one of the most eminent and influential academics in Australia.

Among his many other roles I'm pleased to note that Ross retains chair at the Australian National University. CDU has very close partnership with ANU, collaborating in several areas and these include the North Australian Marine Research Alliance, which has as one of its research themes the potential impacts of climate change on the seas off Darwin, which I'm told are warming faster than almost any other of the world's oceans.

So I trust this evening's forum will be an informative and lively occasion and I would now like to introduce my colleague, Professor Andrew Campbell, who is a director of Charles Darwin University's Research Institute for the Environment and Livelihoods, and he will provide more information about tonight's forum. He'll formally introduce Professor Garnaut and he will act as moderator of the proceedings. Thank you.

ANDREW CAMPBELL: Thank you very much, Gary. Tonight's forum will be an interactive one, so we'll hear from Ross for about half an hour and then we'll go into a Q&A session that I will moderate and hopefully that'll be a very easy job.

It's a delight to introduce Ross Garnaut. I don't think I've ever read a more daunting CV. As Gary said, Ross is probably the most influential academic in Australia today, although that term really doesn't do justice to someone who seems to have squeezed three highly successful parallel careers in academia, in public policy and in business, into one lifetime.

The academic Ross Garnaut is an economist whose career has been built around analysis of and practice of policy connected to development, economic policy and international relations in Australia, Asia and the Pacific. Ross is vice-chancellor's fellow and professorial fellow in economics at the University of Melbourne.

He's also a distinguished professor of economics at the ANU, as Gary said, a valued partner of us here at Charles Darwin University. Professor Garnaut was head of the economics department and the division of the Research School of Pacific and Asian Studies at the ANU for over a decade from 1989.

He's the author, or editor, or co-editor, of 43 books - that's not a typo - and numerous influential articles in scholarly journals and books on international economics, public finance and economic development. He's been chairman of the editorial boards of the journals *Asian-Pacific Economic Literature* and the *Bulletin of Indonesian Economic Studies* since 1989. He's a founding director of both the Lowy Institute of International Policy and of Asialink. So that's an academic career that most of us would aspire to.

In the world of business and finance, Ross is chairman of the Papua New Guinea Sustainable Development Program Limited and retains an ongoing interest in PNG and the countries of this immediate region. He was chairman of Lihir Gold Limited from 1995 to 2010 and has chaired the boards of large Australian and international public companies continuously since 1988. These include the Bank of Western Australia, the Primary Industry Bank of Australia, Lonely Planet Publications and Aluminium Smelters of Victoria, in each case with a strong record of improving corporate governance and business performance.

Ross and his wife Jayne have farming interests on the southwest slopes of New South Wales and he has also a long track record in interest in agriculture and the land sector. He was chairman of the Australian Centre for International Agricultural Research, ACIAR, from 1994 to 2000 and also chaired the board of trustees of the International Food Policy Research Institute in Washington from 2006 to June 2010, so an extraordinary career in business.

In the world of government, international relations and public policy, Ross Garnaut has been consulted on trade policy and relations with Asia and the Pacific by the Prime Minister and senior ministers of successive Australian governments since the Fraser Government in 1975 to 1983.

He was our Ambassador to China from 1985 to 1988 and has led Australian missions interacting at head of government level to Asian countries on trade policy in 1984, to Korea in 1989 and to the African National Congress in South Africa.

Ross Garnaut has also held a number of senior government positions, including as head of the Financial and Economic Policy Division, of the

Papua New Guinea Department of Finance in the years straddling independence in 1975.

He was principal economic adviser to Prime Minister Bob Hawke and he has led many high level government reviews and commissions, including preparation of the report to the Prime Minister on Australia and the Northeast Asian ascendancy in 1989, the review of the wool industry in 1993 - that must be one of many reviews of the wool industry, Ross - the review of Commonwealth state funding 2002 and the subject of tonight's forum, the Garnaut Climate Change Review of 2008.

At that time - and I believe still - that was the world's most comprehensive analysis of the public policy implications of this highly complex contested issue. So it wasn't a surprise that Ross was appointed as an independent expert adviser to the Multi-Party Climate Change Committee in September 2010 and was commissioned in November 2010 by the Minister for Climate Change and Energy Efficiency to update significant elements of his 2008 Climate Change Review.

So this forum is an opportunity for us here in Darwin to hear from Ross about the update of that review. Similar forums have been held in all other capital cities, but we're lucky in that we're the closest event to his reporting to the Prime Minister on this. I'd strongly encourage those of you who haven't read the update to check it out at www.garnautreview.org.au.

So as I said, we'll now hear from Ross for a relatively short address; he's been on his feet most of the day and then we'll have a chance for an interactive question and answer session for forty, forty-five minutes or so.

Thank you very much Ross and welcome to Darwin.

ROSS GARNAUT:

Thanks Andrew, thanks Gary and thanks Andrew for bringing the event together, you and your people at CDU. And I'll mention now our thanks to Vikki McLeod of the Northern Territory Government for helping with arrangements in a busy day that began with a speaking engagement at seven o'clock this morning.

It's always good to visit Darwin; I've been here quite a number of times, but not for as long as I'd like, and I always like to catch up and to hear what people are thinking.

As Andrew mentioned, I gave my final report of this current update of the Climate Change Review to the Prime Minister last Tuesday morning and I addressed the National Press Club after that and put the final report on the web. Cambridge University Press is bringing it out as a book and that should be generally available later this week, but the cheap way to get it is on the web.

There's been a lot of interest in this update of the review, as there was in the original review and that interest exceeds anything that I've worked on in public policy in my career of work on public policy going back several decades.

And that public interest, a concern to do something about the problem, to make sure that Australia contributes its fair share of the problem, is the reason why this issue is back on the public policy agenda. The major parties had had enough of it by early last year, but the question's back because our community recognised that it was too important to let slip.

We are right now, in the middle of 2011, 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, and also a struggle about how we go about that.

As I framed the issue in the introduction to the main report, we can see this is a struggle over policy between special interests and the national interest. This is not a new struggle, it's always been with us and always will be with us, but there are periods in our history when the national interest is dominant, which dominates special interest, and other periods of our history when special interests have the upper hand.

And the difference shows through the first eight decades of our Federation; I think we can characterise a lot of Australian economic policymaking as policymaking dominated by special interests, by vested interests. So that was the era of protection and regulation where protection was used to confer benefits on those who could catch the ear of government, or apply pressure on government to their own advantage.

And the consequence of that is that Australia was the poorest performing economy on productivity growth amongst all the countries that are now developed, if you take the whole period from 1900 to 1980.

Well in '83 we managed to break out of that and we reformed a lot of our protection regulation and the consequence was that through the '90s we were the highest performing of all the developed countries in terms of productivity growth. Well, I'm afraid that since the beginning of the twenty-first century we've reverted to type and again the difference shows and we've had no productivity growth to speak of so far this century.

Our incomes have kept growing very strongly; first through a consumption and housing boom from about 2001 to 2004 or 2005, which was funded by foreign borrowing by our banks. And when that was about to end in a bust that would have been very painful, we were rescued by very high terms of trade, what's generally known as the China boom.

I think it's very important that we break out of that; we can't stay prosperous forever based on foreign borrowing by our banks, unsustainable foreign borrowing by our banks, as we did early in the century, or by a resources boom. A resources boom is all well and good, but it doesn't keep booming louder and harder forever; sooner or later we're going to have to return to productivity growth.

I think - and the return to productivity growth will mean a return to accepting that at times you need to take out policy decisions from which there are some losers; some business interests have to take a haircut in the process of developing a more competitive economy.

It's also, in a situation where you're focusing on long term productivity growth, you sometimes have to do things that cost a bit in the short term and you get your payoff in long term productivity and long term sustainable growth in living standards. We weren't very good at that for most of our history; we haven't been good at it recently. Dealing with climate change requires us to be good at those things again.

The debate about climate policy at the moment is being conducted at a time when Australians are enjoying the highest material standards of living in our history, both absolutely and relative to other countries. I've got a chart in chapter seven of the final report that compares income levels - average income levels with the United States. For a

long time, in the second half of the last century, we were around eighty, eighty-five per cent of the average incomes in the United States, now we're twenty or thirty per cent above average incomes of the United States.

The different isn't that we've become more productive; the difference is in recent times the resources boom. Good times like these - and I fear temporarily good times unless we get our act together on taking good decisions in the national interest - good times like these are a good time for structural reform, for taking hard decisions that will give us long term benefits, like taking the right decisions on climate change.

But while economically this is the best of times for a reform like climate change, the resources boom has, as the other side of the coin, quite a lot of pressure on many industries that supply export markets or compete with imports.

The resources boom has pushed up the exchange rate - and especially the real exchange rate where you take into account the nominal value of the dollar that you see on the news every night, but also take into account inflation differentials between Australia and other countries; not only is our dollar very high, but inflation has been higher for quite a while in Australia.

So the general competitiveness of trade exposed industries has become much less. Not the resources boom which has benefited from very high international prices, but for the rest of the economy. And the resources boom and the high exchange rate that's gone along with that has put crushing pressure on all of the other export and import competing industries; certainly on manufacturing, on parts of farming - some parts of farming have also enjoyed high export prices and that's been a relief.

It's put greater pressure on our universities, just talking now to the deputy vice-chancellor, that Charles Darwin doesn't have such a high share of its income coming from exports from foreign students as southern universities do. It's common in southern Australia for universities to get a quarter of their income from foreign students, so the universities are export industries which suffer from the high exchange rate and that's putting great pressure on many of Australia's universities, great pressure on manufacturing.

And the manufacturing industry in particular has said, well we can't afford to have any carbon pricing now because we're suffering such extreme pressure at the moment, and they're tending to blame the pressure they're under on carbon pricing, even though they haven't - though they're in trouble now and haven't yet experienced any carbon pricing. You can see that in statements from the steel industry and several others.

Well I think it's very important for us to be clear the pressure on our other tradeable goods industries from the resources boom comes from the resources boom; it doesn't come from carbon pricing. The detailed modelling shows that if you implement a carbon price in the way that I propose, then there's no overall loss of employment or investment in the manufacturing sector, in fact it might be a small increase.

The reason for that is that carbon pricing would put a bit of pressure - not much, but a bit - on coal and on some other natural resource industries. That means the exchange rate won't be quite as high and it means that not as many jobs have to be killed in manufacturing and the universities, in tourism and other tradeable goods industries.

So while this time of very high incomes is a good time for long term structural change like carbon pricing, the short term pressures from the resources boom have created an excuse for delaying action, and I think it's very important we see these issues clearly and are not diverted by falsely attributing pressure on manufacturing to carbon pricing.

Well, we're coming up to a critical decision point. I've noticed on the web, at a glance just before I came here, that the Minister for Climate Change said he expected the Multi-Party Committee on Climate Change to settle a policy package by the end of this month. Certainly the Prime Minister has said that she would like to be able to announce all the details of a package early in July.

That all looks feasible to me, but if it does happen, the Government will have taken one of the most long-dated reform decisions that Australia has ever made, under extraordinary pressure from sectional interests who are trying to delay or divert the policy action. I think that we'll get there, but there's still a lot of resistance to it and it's not certain till you're there. If it gets through the Multi-Party Climate Change Committee, then it's likely to be legislated and come into force in the middle of next year.

If, by any chance, this fourth attempt to introduce carbon pricing in Australia fails, it would not end the debate about climate change policy, developments overseas, the continuing impact of knowledge about the reality of climate change and developments in the science of climate change, would keep the issue on the agenda and we would find that we were having to come back to the issue in less and less favourable circumstances.

Inaction by Australia would invite retaliation by countries which are doing more; I think it would be an imprudent situation for a country as isolated from the major global trade blocs as Australia is to put itself in that position. There'd also be continuing uncertainty about climate policy, there'd be no confidence that nothing would happen and so there'd be great uncertainty about what was going to happen and this would raise the supply price of investment in business.

And we would find, as we've found recently, that the political system would fill the vacuum of climate policy and we'd get pressure from myriad interventions under pressure from particular interests, which would turn out to be very costly and which would not give us large reductions in emissions.

So the failure of current efforts, the efforts that all come to a head this month, would lead to a long period of policy incoherence and instability that would be very costly for Australia. Amongst other things, it would help to reinforce what I've called the great Australian complacency of the early twenty-first century, the return of vested interests, special interests, as the dominant influence on Australian policy.

One of the things I was asked to do was to update the conclusions of my 2008 review and I published eight papers in February and March, all of them available on the website, which talk about developments in particular areas. One of these was on the science, and developments in the science since my last review have strengthened the evidence that climate change is a substantial threat to the wellbeing of Australians living in the future.

In 2008 I pointed out that Australia would be affected more and worse by climate change than any other developed country and nothing has changed in the intervening period to vary that conclusion. But we've got the most to gain from effective global mitigation, simply because

we'll be the developed country with the most to lose. But it happens that we've also got a lot to gain because in many ways we're the best placed of the developed countries to develop low emission alternatives to products of our established carbon intensive economic structure.

We start with the most carbon emissions intensive economy in the developed world, with emissions per head of over twenty-seven tonnes. But we've got better resources for all of the low emissions energy sources than any other developed country, so the opportunity is there for us to make a productive transformation.

We've also got exceptional opportunities for biosequestration, which is very important potentially in the Northern Territory; the storage of carbon in soils, woodlands, pastures, forests. And our strength in the mining industry and the resources industry gives us high levels of skills and professional services that are necessary for success with many of the new technologies, especially the new energy technologies.

So we've got the most to lose from a failure of global mitigation, but we're well placed to make a big contribution and to do well in a world in which everyone is taking mitigation seriously. If strong global mitigation is in our interest we do have to recognise that it won't be effective dealing with the climate change problem unless all substantial countries do their fair share.

This is a collective action problem - it's hard because it's a collective action problem, but it's not altogether unusual. We often come across collective action problems in both domestic policy and international policy, problems that have no solution without cooperation amongst substantial numbers of people domestically or countries internationally.

And indeed the difference between civilisation and anarchy, domestically and internationally, can be seen as a difference between being able to take collective action when it's necessary to deal with a big problem and the failure of that capacity. So this is a hard problem, but not different in kind from some other problems to which the world has found solutions.

One thing that's very clear is that if any of the developed countries aren't pulling their weight, then it's going to be impossible to get developing countries to pull their weight, because they are in a worse position to carry the early costs of transition to a low emissions economy than the developed countries are. So it's only if all of the developed countries are doing their fair share that we're going to get a global solution.

It's not very clever for the country that has the biggest interest in effective global mitigation to be a country that's not pulling its weight, and we're not pulling our weight currently. We've got an unconditional target to reduce emissions by five per cent from 2000 levels by 2020; that's supported by the Government and Opposition. That was actually my recommendation from the 2008 review of what we should do if it turned out that other countries weren't doing anything and it was going to be our payment of - our price for keeping alive the possibility of future mitigation.

The bad news is that we're nowhere near on a path to reaching that five per cent reduction, because under current policies - which includes a lot of policies that are said to be there to reduce emissions like the renewable energy target, the various solar programs and so on, we're heading towards - or at the end of last year we were heading towards a twenty-four per cent increase in emissions by 2020, and that's before we've added in a number of new announcements on major coal and natural gas projects which will further increase our emissions.

So we've got a long way to catch up, there's no other developed country in which the gap between what they've said they'll do and where they're headed at the moment is anywhere near as wide as in Australia.

Some Australians fear that with carbon pricing we would get ahead of the rest of the world, as I pointed out at length both in my final report and at the Press Club. You can tell people who fear that that there's nothing to be frightened about; Australia is so far behind that we run no risk whatsoever of getting ahead of the world.

The Scandinavian countries have had carbon pricing since the early nineties. One of these, Norway, is a country with enormously rich fossil fuel endowments per person in the form of oil and natural gas. It's the one developed country that's got anything like Australia's endowment for fossil fuels per person, probably more in value than Australia. It's had carbon pricing since the early 1990s. Despite all the opportunities to develop an emissions-intensive economy like ours, their emissions per person is about ten tonnes a person, similar to most of Europe, similar to Japan.

We have over twenty-seven tonnes per person, the highest of all the developed countries. The European Union's had carbon pricing since 2005. Take Scandinavia and the European Union together, you're talking about - and countries that are not in the European Union but a part of the European Union Emissions Trading Scheme, you're talking about half a billion people, half the people of the developed world. But some European countries have gone well ahead of their membership of the European Emissions Trading Scheme. Germany, France and the United Kingdom have additional - well, most European countries but those three in particular, have strong additional targets.

The United Kingdom just two weeks ago under the Conservative-led Government agreed to legislate to halve its emissions by 2025 from 1990 levels, notwithstanding a much lower base of emissions than we've got and notwithstanding that it's still got very high unemployment after the great crash.

It's common for Australians to say, well Europe does its own thing but China and the United States which are the two biggest emitters of greenhouse gases in the world aren't cutting emissions. Well, actually, they are.

In the case of China, they've got a target of reducing emissions intensity of forty to forty-five per cent between 2005 and 2020. As I discussed in one of the update papers on the international situation and as I discussed in the final report, that represents a very substantial commitment and China is acting on that. Implementation of that commitment is a central feature of the twelfth five year plan which was unveiled by the Premier in March.

In the United States, President Obama has committed the country to reduce emissions by seventeen per cent over 2005 levels by 2020. We tend to - our five per cent by 2020 is on a 2000 base. If you convert the US to that base, it's a sixteen per cent reduction in emissions.

The United States and China don't have carbon pricing, that's true. They're reducing emissions through regulatory means and as I discuss in the final report, regulatory means are more expensive than carbon pricing to reduce the emissions by the same amount as America's doing or China's doing through regulatory means. It would cost us more than carbon pricing and I don't see why we should impose a bigger cost burden on Australian households and a bigger cost burden on Australian business to achieve a similar emissions

reduction simply because some other countries are doing it. I don't see why we should shoot ourselves in the foot just because China and the United States are choosing to shoot themselves in the feet.

Just a couple of points that are coming up in discussion in my report. It's common for people to say "well we don't have an international agreement so Australia should wait until there is an international agreement". Well, there is an international agreement following the Cancun meeting of the United Nations Framework Convention on Climate Change. It's not the international agreement that I would have designed, it's not what Australia was hoping for or Europe was hoping for, but it's actually an international agreement that suits the perspectives of the United States and the big four developing countries. China, India, Brazil and South Africa were the big four in those climate negotiations.

It's not a binding agreement, it's not based on allocating responsibility for emissions reductions across all countries by prior agreement and there is a commitment there to take action to hold the expected increase in temperature from pre-industrial levels to two degrees Celsius. That's an ambitious agreement.

The method of approaching that goal is described as pledge and review, with each country identifying the emissions reduction that it will implement, adopting similar approaches to measuring and verifying emissions to other countries so that you can compare effort across countries. The review part includes looking at what others are doing, putting some pressure on the laggards. I think that process can give us good results. I would like it to be followed at some time by a binding international agreement with the international legal consequences. But we might - I think we will get further over the next few years through pledge and review than we would have got if we'd tried to complete an international agreement.

There are even some Australians who say, "well it's climate change, it might matter. Someone should do something about it. Yes, it's an international problem but we don't matter, we're inconsequential so let's save our money and not do anything and let the bigger countries carry the burden". Well, I've already explained that we wouldn't get international progress if one significant country did that and Australia in this context is not inconsequential. And we would be acting inconsistently with the way we look at Australian participation in many international matters.

Would there have been any of the major regional or global wars in which the outcome would have been different if Australia hadn't participated? Possibly not; possibly, but in any case we don't apply that sort of logic to other international issues. The reason we apply to climate change is as an excuse for not doing anything. Fortunately, it's having less and less traction and I think the hollowness of that sort of position becomes apparent once we look at what other countries are doing.

If our one-point-five per cent of global emissions don't count, does Britain's one-point-seven per cent of global emissions count? Little bit surprising Britain's emissions, three times as many people but about the same as ours. But despite that, Britain's committed itself to reduce by half by 2025 its emissions. Margaret Thatcher was a leader of the global effort to take climate change seriously and every British Prime Minister since Margaret Thatcher has seen Britain playing a major role. So other countries that are of similar dimension to us, other countries in the developed world, haven't taken the attitude that they don't matter. I think there's good reason for that. British action has actually

had a big influence on global action. Ours could - well, ours did, but unfortunately it was a negative effect.

We need to do our fair share. I've recommended not that we be a leader, I've already said that's impossible given where we're at but we can reasonably aspire to do about the average effort of the developed countries. That's where I've tried to place us in these recommendations. I discuss in the final report how to measure a country's fair share. You end up having to try to - in the end, you end up having to try to allocate entitlements to emissions on a population basis.

I don't think there's any basis that, in the end looking forward, is going to be acceptable in the international community but in a long transition to that position, we can - I've defined some principles that I think have got a reasonable chance of broad acceptance. I've described them as modified contraction and convergence that would leave us with entitlements well above the rest of the world but with a gap declining over time until we reach an equivalence in about the middle of the century.

That doesn't mean that we would have to get emissions within Australia down to the same per capita level as other countries because an efficient global system will provide opportunities for international trade in entitlements but we'd have to pay for any level of emissions above the average per person. I won't go into details either of the scheme or the allocation of revenue from the scheme from my recommendations. You've probably seen reports of it; you can read it on the web.

I'll just make the point that, in addition to the economic cost being much lower from carbon pricing, a market-based approach where millions of Australians take decisions on how they can reduce emissions in the light of the incentive in front of them, the cost of that is much lower than achieving the same level of mitigation through some clever ministers and bureaucrats telling us all where - what to do. And not only is the economic cost less from the carbon pricing but the Government receives revenue from carbon pricing.

Under my recommendations, about eleven-and-a-half billion in the first year and that's available to reduce taxes, to support innovation and therefore accelerate the development of the low emissions technologies, to assist trade exposed industries, to buy offsets from the land sector which, in Australia, can be very large. And I think that those two advantages, the lower costs and the availability of revenue for those purposes, make a decisive case for carbon pricing.

To sum up, this is the fourth time that Australia has moved towards economy-wide carbon pricing. Each time we failed in the past, the retreat of economy-wide action did not mean the end of climate change mitigation policies. An array of regulatory interventions took their place with little effect on emissions but large effects on Australian costs. And it would not be the end of climate change action if the current work on carbon pricing did not lead to carbon pricing being embodied in law this year and action next year.

The biggest of all the costs would be the contribution that would make to the entrenchment of the old political culture of Australia, the old political culture dominated by vested interests. If we reject carbon pricing this month or this month and early next month, the climate change policy debate will still be here tomorrow but Australia's chances of dealing with it at relatively low cost may not.

Thank you.

ANDREW CAMPBELL: Thank you very much, Ross. It's a bit sobering to think that we now have to aspire to become average and that that's a stretch-goal.

We'll go into question and answer sessions, we have two mikes down the front here. I'd like people to come down and line up behind the mikes if you're interested in asking a question of Ross. And just while you muster the courage to do so, I should also take the opportunity to thank Vikki McLeod from the Northern Territory Government for ensuring that we got Ross to Darwin in the first place and secondly for giving CDU the opportunity to host this public forum. It's a rare opportunity so let's not waste it. The aim has been to hear from Ross, which we've done, and now to interact and ask questions.

Please keep those questions succinct and respect other people's time by refraining from making statements. If you could please also respect the views of others, state your name and any affiliations you have and, for those who've not already done so, please turn off mobile phones. Thanks very much.

MICHAEL CAUCE: Hi there, Ross. My name's Michael Cauce from Climate Action Darwin. Ross, I just wanted to ask you your opinion on how we avoid, through our carbon price, locking in gas for the next thirty, forty, fifty years.

ANDREW CAMPBELL: You don't need to stand unless you feel like it, Ross, so, up to you.

ROSS GARNAUT: I actually talk better when I stand.

ANDREW CAMPBELL: Yeah, me too, me too.

ROSS GARNAUT: Gas is a very useful transitional fuel. And the emissions from gas, for example, in the generation of energy - about forty per cent of Victorian brown coal, about half of Queensland and New South Wales black coal. There's a very important point in your question that our moving to gas is not enough. Countries of the developed world will have to reduce emissions by about ninety per cent by the middle of this century. The economically cheapest path to that will start very soon, or it would have started a little while ago, quite a while ago. But the sooner we get going the better and steady reduction in emissions during that period will give us the lowest cost.

And there's a role for gas in that transition, there's a role for gas in the transition out of coal initially in other countries. The first thing we've got to do is be clear in our heads that it is just a transitional fuel and most importantly, for implied commitments not to arise to let gas plants go for the end of their economic lives, so decisions should be - or what would have otherwise been their economic lives in the absence of a rising carbon price. The economically sensible carbon price will keep rising over time and that will drive us towards, globally, the very large reductions in emissions that we need.

Everyone has to accept that that will be continually making more and more of the old emissions-intensive activities redundant. So the first thing we've got to be very clear about is that, if private investors make investments in gas now, there should be no implied commitment that those plants should last forever. That - really, this comes back to the old question I was talking about, the struggle between a national interest and vested interest. If we can do that then we've done the most important thing to avoid lock-in.

We have to put a fair bit of the carbon revenue into support for innovation. I've suggested moving up towards two-and-a-half-billion dollars per annum into innovation and that should be support not for any particular new technology but for innovation in low emissions technologies so that the first people to do new things in Australia

should get support for that. The renewable energy target is very unsatisfactory from that point of view because it just supports the lowest cost of the established technologies, which happens to be wind. Overwhelmingly, the renewable energy target will just support wind.

I think the combination of carbon pricing and support for innovation, big support for innovation, is what we need to drive things forward. That should be available for all of the new technologies. There's two ends of the innovation chain. One end is the - closer to the pure research chain, the research and development end, and the sort of work we do at universities and the CSIRO. We need more effort in that, you can't get away from experts taking views on which are the most promising of the technologies for that. The criteria at that end should be what's in Australia's national interest if it succeeds. Will we be able to make good use of that if it succeeds? And, secondly, do we have a comparative advantage in research in a particular activity? Do we have the research strengths that make it likely we will have success?

As you get towards the commercialisation end of the innovation chain, demonstration plants - the first commercial plants, I'd like to see us move towards a matching grant scheme so that if someone demonstrates that a new technology involves genuine innovation, new knowledge that the whole community learns from and it involves reductions in emissions, then there should be a fairly automatic dollar for dollar matching in private expenditure. The justification of the public expenditure from the carbon revenues is that we won't get enough innovation without that sort of support. So I see that as being crucial to the objective that you raised.

ANDREW CAMPBELL: Next speaker?

YOUNG MALE: Hi, my name is [inaudible] I'm a senior economist at [inaudible]. Before that, I used to work at your department RS PAS and you've - for a while I was doing my masters there. It's always good to see a fellow RS PAS person, it's always good to hear you talk as well. I have a few questions, I was wondering - three questions. I was wondering if you could shed some light on that. First is the debate on carbon tax and ETS and the pros and cons about carbon tax is administratively easier, it's a bit more transparent. ETS sort of is more efficient in terms of minimising emissions where it's least expensive.

I was wondering if you could tell me, or tell us, what were your thoughts behind putting your weight in favour of ETS as opposed to carbon tax; the second thing is - second question is, when we have a sort of flexible price, it can sort of fluctuate quite wildly. I was wondering what are your thoughts on sort of having a ceiling and a floor to start off with, especially given that would make things a bit more certain for people investing in climate - the greener technology.

The third thing is, as you mentioned, innovation will be a big driver in sort of tackling climate change. I was wondering, you proposed that about ten to twenty per cent of the carbon tax revenue, or carbon price revenue, should be allocated to innovation. And I was wondering, would it be a better idea to have a bigger share going towards innovation as to compensating households? Thanks for that.

ROSS GARNAUT: Okay, yeah. Well, tax versus ETS. The first thing I would say is the difference between the carbon tax and emissions trading scheme is very small compared with the difference between market-based approaches and regulation. And both the carbon tax and emissions trading scheme are market-based approaches. They put an economy-wide price on and then businesses and individuals respond to that price, make decisions to reduce emissions based on that price. So

the similarities are much more important than the differences. And I would not have thought it a bad thing if Australia had gone the other way.

One important difference is you can be more certain of delivering the quantity of emissions reductions with an ETS and given that we're getting into a stage where the long delay in action makes reductions in emissions urgent and then being able - the ETS allows you to say, well, there's only going to be this amount, number of - this amount of emissions. We're going to issue that number of permits, it will be illegal to emit greenhouse gases beyond that, so you know you're going to reach the target, and then the price emerges from market exchange. The carbon tax can't give you the same confidence about reaching a target. In fact, it would be hit and miss and you'd have to change the carbon tax if it was a miss. So, that's one factor; quite an important factor.

I think an ETS fits more easily into a system of international trade entitlements. You can have international trade with a carbon tax but it really is trade between governments and I think there are some advantages in private exchange of entitlements internationally. I think international trade in entitlements is very important for our neighbouring countries and for Australia, a point that's been emphasised to me by members of the Indonesian cabinet on many occasions.

Finally, when I began my work, Australians had been thinking in terms of an emissions trading scheme and there was quite a lot of acceptance of that approach, more than there was acceptance of the carbon tax. Now, that's not a reason in itself but, given that on balance the other factors were slightly positive for an ETS, then that helped to confirm the positives.

Then the fluctuations in price, I don't favour a floor or a ceiling, except in the early years I've suggested a fixed price for the first three years which gives you a floor and a ceiling, so I've suggested that in the early years to introduce confidence at a time when there might be, for a while, continuing political disputation. If we introduced a carbon price through an ETS with a floating price and the Opposition parties were promising to withdraw it if they won the next election, if people believe them, then every time the opinion polls changed the carbon price would change.

I actually think that if we - that if the Government legislates, if the Parliament legislates, along the line of my proposals that not long after it's introduced everyone will wonder what the fuss was about and will get on with adjusting to it as they did in Europe. But there'll be a period of uncertainty and a fixed price for three years just settles things down through all of that.

But once you've got the system working with opportunities for international trade, the international market will provide some stabilisation and when you get a big downturn in the global economy there will be some reduction in carbon prices but that will be stabilising economically. When Europe took a big hit in the global financial crisis, the price of carbon fell, that took a bit of pressure off industry and it was able to meet its carbon targets because reduced economic activity made that easy. I think the fluctuation was actually a help economically and no problem environmentally.

The ratio to innovation, I suggest going up to twenty per cent over time by 2020. Should it be bigger? Well, I think we can get quite a lot done with two-and-a-half-billion dollars a year which - and there'll be two-and-a-half-billion dollars or more under that twenty per cent. If we

were using all of that well and then it would be easy to make a case to me about increasing that. At the moment, it would make it more difficult to introduce the measure if low and middle income earners weren't being compensated through tax cuts and in other ways.

But we'll get another - we'll get a chance to review this situation because the requirement to provide assistance to trade-exposed industries is likely to fall over time and so there will be more money to allocate and so decisions can be reviewed later on about whether we should give more to innovation.

ANDREW CAMPBELL: Thanks. Shelley?

SHELLEY FRANKLYN: I guess my question sort of follows the end of that last question, so more on a grass root sort of level. In your review you mentioned...

ANDREW CAMPBELL: Introduce yourself, Shelley.

SHELLEY FRANKLYN: Sorry, I'm Shelley Franklyn, a masters student at Charles Darwin Uni. In your review you mentioned tax breaks for low to medium income earners. What other mechanisms do you think should be put in place to ensure that tax isn't indirectly through price hikes passed along to the end users? Obviously the end users have a choice on who they can choose to use, but in remote areas like Darwin you don't have a choice, i.e. electricity.

ROSS GARNAUT: Yeah. Well, it happens that in Darwin and Katherine, which are part of a gas-based electricity grid, carbon pricing will have less of an effect on electricity prices than in the rest of the country. The tax cuts and adjustments to social security for those who aren't in employment and therefore don't benefit from tax cuts will be on a national basis so Territorians probably make a profit out of that and us poor old Victorians will - might end up being on the other side of that coin.

The tax cuts or adjustments to social security for low and middle income earners are designed to offset the effects on the standard of living of increases in electricity and other prices, but they don't reduce the incentive to economise in use of electricity. Studies abroad have established that, for a ten per cent increase on electricity prices, soon after the increase, there's an average reduction of about three per cent in demand for electricity and after time, after people have adjusted, reduction of about seven per cent I would expect some response like that. The fact that people are getting tax cuts or social security adjustments won't remove the incentive to use less electricity as it becomes more expensive.

But the point is often made that it is more difficult for low income households to adjust to use less electricity because they can't pay the capital costs of insulation or energy efficient appliances. There is scope for some targeted programs to assist that adjustment. The Commonwealth has proven it's not very good at that sort of service delivery. So I've suggested that the Commonwealth should, in a way that's a modest dimension, contribute to expansion of some of the successful state and territory and also private like Brotherhood of St Lawrence programs where it's being demonstrated that they're delivering good results in that area.

ANDREW CAMPBELL: Thank you. Over here.

TRUDY CAMPBELL: Yeah, hi Trudy Campbell, Citizens Electoral Council. So when you cooked up your reports, did you take into account the still unfolding global financial crisis? And you have seen Strauss-Kahn, off, head of the IMF. So do you support, if so, do you support Lyndon LaRouche's call for a global Glass-Steagall in order to reorganise the financial

system and heavily re-regulate the banks so that they cannot speculate and profit from carbon credits and trading?

ROSS GARNAUT: I've written a book about the global financial crisis and I don't think LaRouche has the best solutions to it.

JUSTIN: Yeah. G'day, I'm Justin. I'm a greenie. I'd just like to tease out a little bit more about gas. You told us your gas has value as a transitional fuel and it's a bit cleaner than coal. We hear a lot of that, like our Climate Minister, he loves it. He's always telling us how gas is a transitional fuel and how gas is cleaner than coal. Like you said, we've already got gas power here we don't have any coal power here.

But it's all about - well right now we've got this new LNG project impacts that's going to over the next forty years, lift our emissions, our carbon burden on the territory by thirty per cent. He's overseas, you know, spruiking the territory as a base for more of that type of fossil fuel industry.

Is it not true that transition is a capacity rather than, you know, an integral attribute of gas? Isn't it true that, you know, by sucking it out as fast as possible and giving it to the first person who wants it we're possibly squandering that capacity, that we're not necessarily wisely applying it; in fact, maybe without some kind of international agreement or without some comparable commitments from our - the customers of the gas, then that's what we're doing?

ROSS GARNAUT: Yeah. Well I think the customers of the gas are buying the gas partly because they're taking environmental issues seriously. The big customers for our natural gas are the northeast Asian countries, Japan, China, Korea, Taiwan. Why gas has become in such a high demand is partly its environmental benefits, so partly the greenhouse benefits, but partly other environmental benefits; less particular - than you get from coal, combustion, less sulphur dioxide and so on.

So - and one of the reasons we're having a gas boom is that some of those countries are taking their environmental issues seriously. I'm not at all sympathetic to arguments for exclusion of national gas from constraints, carbon constraints in Australia because someone has to pay for their emissions. So they're added to Australia's total. If we get a - I heard today a figure from that Inpex project of increasing Australian emissions by three per cent that sounds very large. But whatever it is, if they don't pay for the emissions, someone does, as I mentioned in my talk, there is a big reduction - big pressure crushing other export and import competing industries because of the resources boom to add on top of that burden the requirement that other industries also pay for the Australian emissions of the - of LNG, just - well I think most people would think it unfair, but there's no economic logic behind it as well.

I just repeat the point I made earlier, I think it's very important that we don't introduce any inappropriate commitments for existing capacity to be run beyond what otherwise would be its natural life. Because a rising carbon price will make gas uneconomic at some time in the future. But it is a step forward to replace coal by gas in the meantime.

ANDREW CAMPBELL: Okay, Robin.

ROBIN KNOX: Robin Knox, Green Alderman Darwin City Council and program manager for COOLmob, a sustainability program. I just wanted to ask about introduction of a feed-in tariff. Do you think that would speed up the expansion of renewables and do you think it's economically wise for this country?

ROSS GARNAUT: Well feed-in tariffs can be done in different ways and we've over-egged the pudding in a number of Australian jurisdictions leading to a sudden boom in putting photovoltaic on the roof, with a very big cost in terms of increased - electricity prices for people, not as big as some of the other sources of electricity price increases, a bad - not as big as bad regulation of investment in networks, but nevertheless, unnecessarily high costs. So it's not good economics from that point of view.

I think that proper pricing of emissions, rewarding people for efforts they make in taking pressure from the electricity system at peak times, combining all that with support for innovation, would give us a better result than feed-in tariffs.

I think the best support for the new technologies is this type of - the combination of the carbon price and the support for innovation. But we have got support for photovoltaic roof-top solar through feed-in tariffs in many places. And the task will be to rationalise those to take the edge off some of the horrifically expensive schemes. And I hope that that can all be done in an ordered way, rather than in the panicky political way that's currently driving things.

ROD: I'm Rod; I'm just an interested local. But I was wondering, you spoke earlier about the dangers of having vested interests influencing things. What - assuming we don't get an ETS and we stick with the carbon tax, what sort of mechanism would you propose to actually set carbon price? Because it looks, I guess, like it will be set by an agreement with the Government and interested parties. Would you propose setting up something like the RBA with that sort of independence? Or what sort of idea would you think to set carbon price?

ROSS GARNAUT: Well I've recommended a fixed price just for three years and then a floating price. I'm recommending - and I'm pretty sure this will be adopted - the structure of an ETS right from the beginning. And what's called a carbon tax, I wouldn't have thought of calling it a carbon tax, but it's just putting a fixed price on the Emissions Trading Scheme and the regulatory authority issuing a fixed price in the meantime.

Then, after that three years you would set targets and give out emissions that added up to those targets and you'd let the market set the price. I think that independent governance is crucial to the successful operation of the scheme and I suggest three independent bodies to play a big role in governance. One an independent regulator of the scheme itself in that it's a bit like, I suppose, the tax commissioner who has some statutory independence, you can't have ministers saying, this person is exempt and this person isn't. And the tax commissioner has the backing of the law in holding political pressures at bay. We need an independent regulator to regulate the scheme.

I have suggested an independent committee to recommend on targets. Now the Parliament needs to be able to overrule those recommendations, but by setting up a well credentialed independent committee and requiring that the Government either accept the targets or table in the Parliament reasons for not accepting them, you make it more difficult for arbitrary political influences to take over. And my proposals are modelled very closely on the British, or the UK Climate Committee which came up with those strong recommendations which weren't welcomed by all members of the British Cabinet. They debated them for several days and then decided to confirm them.

And I think as time goes on the authority of that independent committee, if you have got good people on it, will grow and it will

become politically harder to overthrow the recommendations than to accept them. That's what happened with the independence of the Reserve Bank. The Government has the power to overrule the Reserve Bank, but it doesn't do so. It would have to table in the Parliament the correspondence with the governor of the Reserve Bank and table in the Parliament its reasons for overruling it. And over time, the authority of the Reserve Bank has grown so that it's now thought to be rare that that would actually happen.

We've got other bodies of that type, the Productivity Commission another one where, because of its authority, it's not impossible for Government to overrule it, sometimes it does, but it raises the bar. And the third independent authority we need for good governance is an independent agency like the Productivity Commission, which could be the Productivity Commission, to recommend on assistance for trade exposed industries. I think a principled approach to assistance for trade exposed industries would give out on average less support than the CPRS gave out.

And I've recommended a CPRS type arrangement can continue for three years because it will take time to put in place, the administration of a principled approach. But I think it's very important that we have an independent agency playing a major role in those assessments. I've suggested that can take place after three years, again the Government would be able to overrule decisions, but the professional standing of the agency I would hope would grow over time and make such overruling difficult and rare.

ANDREW CAMPBELL: Okay, Stephen.

STEPHEN GARNETT: Stephen Garnett from Charles Darwin University. My question relates to the trade exposed industries. Since Australia is a laggard, do they really need this sort of compensation that's been mooted and what's happened with the European trade exposed industries? Have they got some form of protection?

ROSS GARNAUT: Yes they have. They have got assistance that in magnitude is probably not very different from what is being proposed in the early years in Australia. And they started with more assistance. So I would hope to put in place more discipline about more principles and more independent assessment of what's required for the trade exposed industries than the - certainly than the Europeans started with.

And is it actually needed if other countries are doing quite a lot? Not in every industry, but the political economy of things is such that until you can show that through detailed analysis and data and it would take quite some time to build up that analysis and data, then it becomes impossible really to avoid the pressures.

So it's - the reason is one of practical inevitability rather than high principle that leads to the assistance. If you gave none at all, the Australian economy probably wouldn't be significantly poorer but you would have some distortions in investment in some particular industries. The important thing is that we move to that principled approach as soon as is practical and that's what I've focused on.

It also would be very valuable to work towards common international approaches to these things, having a body like the OECD or the WTO play a role in supervision of these matters. I think there is a chance of that but it will take time and take time to build that up.

ANDREW CAMPBELL: Okay. Over here.

JO: Hi, my name is Jo Keeben. I work on energy efficiency in commercial buildings. I'm interested in your opinion on if there's still with carbon

pricing, a role for bottom-up incentives to drive energy efficiency in buildings. I think that you've talked about a natural perhaps improvement of ten per cent driven by the increase in costs of energy. In my experience the potential of energy efficiency is much greater than that, but there's a lot of barriers and you need to get capital to invest. So do you see that there is still a role for very progressive programs to try and drive energy efficiency in parallel to carbon pricing?

ROSS GARNAUT: Because the Prime Minister has set up a task force which reported about the time I was starting my work, in my update I didn't look at the question of energy efficiency and tended to rely on the work that had been done by that task force.

Yes, there is a case for some additional action, essentially for - to deal with the effects of two sources of market failure. It costs a lot for an individual enterprise or household to learn about what it makes most sense for energy efficiency. And that introduces a case for Government to fill the gap either through the provision of information or through regulation embodying that information, which can take the form of building standards or appliance standards. I think there is a case for that.

The other type of market value that's important is the principal-agent problem in many areas where - that are important to energy efficiency, like rented property. The person who pays the bill, the person who's doing the renting, has very little incentive to make an investment. And I think there is a case for at least a strong emphasis on transparency in that requirement of a lot of transparency about the situation of a building. There might be a case for going further.

This is really, mostly, a local government measure but following the work of the Prime Minister's task force, there's some discussion of doing that on a national basis.

ANDREW CAMPBELL: Ross, you've spent a lot of time in New Guinea and in Indonesia. We're about an hour's flying time from Dili. You've recommended in your report that we spend some of the aid budget on helping the countries in the region adapt to or decarbonise their economies.

ROSS GARNAUT: Yeah.

ANDREW CAMPBELL: Can you expand on that, in particular, the countries very close to here with which you've had a lot to do?

ROSS GARNAUT: Yeah. Well I'd be a bit more ambitious than you're describing. Andrew, I think we should explore a regional agreement on emissions reduction. I think the logical core countries in such an agreement, are Australia and Indonesia. Indonesia is a big country on this issue in every respect, amongst other things because of its forestry and peat fires issues. It's the third biggest emitter in the world in absolute terms.

And I think we would do a tremendous service to the international community on this issue if we work with the Indonesians on some common issues. We would have to contribute a lot of expertise in administration, verification, measurement. We're already doing that with some of our aid programs and they've been very successful. I know from my contacts in Indonesia that that's very welcome.

I would see value in Indonesia which has quite an ambitious emissions intensity target, putting itself in a position to trade entitlements if it gets below its targets. I think that our aid program could usefully contribute both to those administrative questions and also to support for introduction of low emissions technologies.

Java and other islands of Indonesia have a very large geothermal potential and we could assist in the development of that. It's going to be crucial in Indonesia getting on top of its deforestation problem that there are real transfers of income rewarding reductions in emissions and that part of those transfers find themselves to the village people who often don't have alternative sources of information - sources of income.

You've got many similar issues in Papua New Guinea. A weaker administrative system, so it would only work if the Australian contribution on administration was even bigger. So in that sense it's harder. If we were doing these things, New Zealand would want to join us and that's natural and logical.

I think there's a conversation to be had with Japan and Korea and if Indonesia were part of a regional arrangement I think that other Southeast Asian countries would as well. Timor doesn't have the same deforestation issues, partly because population pressures have been greater for longer, but it would also be a logical component of such a regional arrangement.

ANDREW CAMPBELL: Sounds like a perfect thing for our Foreign Minister to put his energy into.

ROSS GARNAUT: He would love to.

ANDREW CAMPBELL: Thank you very much everybody. That brings us to a close for this evening. And I'd just like you to join with me in thanking Professor Garnaut very much.

I'd also like you to mark 12 to 14 October in your diaries for the next instalment of the Charles Darwin Symposiums, partnership between the Northern Territory Government and Charles Darwin University. And the theme for this year's symposium - they're held every two years - the theme for this year's symposium is climate change adaptation in the Northern Territory at work, at home and at play. So it's about coming to grips with climate change and what we can do with it up here. And we'll be focusing very much on local solutions and local innovation. So that's 12 to 14 October and it's in the same week as the great Solar Challenge. So mark it in your calendars.

Thank you Ross, thank you Gary and safe travelling everybody.

- ENDS -

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