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Michael Wesley Executive Director Ladies and Gentleman, welcome to the Lowy Institute for today's distinguished speaker series lecture.

Lowy Institute I'm Michael Wesley, the Executive Director of the Lowy Institute and it's a delight to welcome you all here today. The problem of climate change has become a defining issues in the global affairs of the 21st Century. Our speaker today has called climate change "a diabolical policy problem". It has certainly assumed a defining rule in Australian domestic politics, an issue that has in recent years played a central role in determining the political fortunes of Prime Ministers and opposition leaders alike. Internationally, the passage of concerted global action on climate change has been as contested and fraught.

It is hard to think of another global policy issue that is so attended by such a broad spectrum of different perspectives on responsibilities, urgency, entitlements and compensation, and yet climate change seems to offer us a valuable lens onto global politics of the 21st Century.

How the world deals with this issue tells us a great deal about perceptions and strategies on risk management, responsibilities and entitlements relating to inner quality and development, capabilities and prospects of multi-lateral action and the different capacities of different types of political systems to deliver decisive if painful policy action.

Ladies and Gentlemen, who better to come and speak to us today about the international progress and context of climate change action than Ross Garnaut. Australia's most eminent economist was commissioned in 2007 by Australia's Federal and State governments to conduct an independent study of the impacts of climate change on Australia and to recommend policy frameworks to improve the prospects for sustainable prosperity.

The *Garnaut Climate Change Review of 2008* was labelled "a great achievement" by Sir Nicholas Stern who said it was of special importance in its combination of a global view and the perspective from one country. Ross Garnaut became a prominent commentator on the domestic and international failures to come to grips with climate change. In his Hamer oration at Melbourne University last year he used a lack of action on climate change as partial evidence of what he called a "great Australian complacency that has crept into our politics and policy making".

Professor Garnaut was commissioned in November 2010 by the Australian Government to do an update of his *2008 Climate Change Review*. The report is due to be presented to the government on the 31st of May this year. In launching the second of a series of paper updating that review here at the Lowy Institute today, Professor Garnaut will talk about the international aspects of progress on climate change, from the struggling United Nations talks to the policy commitments of some of the world's biggest emitters.

Ladies and Gentlemen, Ross Garnaut is Vice Chancellor's Fellow and Professorial Fellow in Economics at the University of Melbourne. He is a Fellow of the Australian academy of social sciences, an Honorary Fellow of the Chinese Academy of Social Sciences, an Officer of the Order of Australia and a member of the Board of Directors of the Lowy Institute. Previously he has served as Principal Economic Advisor to Prime Minister Bob Hawke, Australian Ambassador to China between 1985 and 1988, and a Professor of Economics at the ANU. He is published widely on international economics, Asia-Pacific trade and integration, and Australia's relations with the world. His most recent book is *The Great Cash of 2008*.

Ladies and Gentlemen, please join me in welcoming Ross Garnaut.

Professor Ross Garnaut Michael thanks for the introduction. Very good to be here at the Lowy Institute. It's the right place in Australia to introduce a paper on the international context of climate change policy and as a Director of the Institute I'm delighted that over recent years this has become the central place for starting these types of discussions. So thanks Michael for the opportunity to present the first paper here.

I'll be releasing – well I'm now releasing the second of the update papers, the second of eight that I hope will be the basis of a lot of good discussion between now and the end of March, and then that all becomes input into the completion of my integrate update for the government and for the multiparty committee on climate change at the end of May.

This is truly an international issue. The debate goes on rather intensively and sometimes egregiously in country by country, but there'll be no alleviation of the threat of climate change to prosperity in one country through the actions of one country alone. Effective action to moderate the risks of human induced climate change requires large contributions to reductions in emissions from all major countries and substantial contributions from the rest of the world as well.

As a result, the search for effective climate change policy is a search for effective cooperation amongst countries of a kind and dimension that has never previously been known. Australia's place in the search for a basis for effective cooperation is a curious one, as distinctive as our native fauna or the peculiar social and economic institutions that emerged as we made our way with our neighbour New Zealand as the world's first democracy in which ordinary people claim for themselves a share of the bounty of modern civilisation.

The *2008 Garnaut Climate Change Review* which I'll call "*The Review*" for the rest of this presentation, demonstrated that Australia has a larger interest in effective global mitigation than any other developed country because it is already a country of climate extremes because of its geographic location in relation to shifts in global climate and because it is located in a region of vulnerable developing countries.

At the same time, Australia with Canada and the United States is one of the three countries in which effective mitigation is constrained most powerfully by the role of established fossil fuel industries in the economic structure and the political process. Of the three high emitting developed countries Australia stands out for having the highest per capita emissions, and I've reproduced in the paper that's released today a chart that's just come out in the *2010 World Development Report* that illustrates this rather clearly. Australia stands out for having the highest per capita emissions of any developed country and the greatest importance of coal in both domestic energy supply and exports.

So Australia is at once the country with the greatest interest in effective mitigation and the greatest domestic political challenge of mitigation. I say “greatest political” and not economic challenge of mitigation because Australia’s exceptional advantages in the old world in which the use of fossil fuels is not constrained by concerns for climate change, is matched by exceptional advantages in supplying virtually all of the potentially major low emissions energy sources; uranium oxide for nuclear power, intense insulation for solar power; proximity and accessibility to some of the world’s richest hydroelectric power resources across the narrows and shallows of Torres Strait in Papua New Guinea, unusually productive opportunities for development of algae as a low cost source of biofuels, amongst the world’s highest quality wind resources, exceptional ocean waves and tides, the world’s richest deep rock geothermal resources, superior sites for carbon capture and storage near established places of coal-based power generation, and natural and coal bed gas a lower emissions fuel during the transition from exceptional dependence on coal.

We also seem to be an exceptionally prospective location for the rare earths that have become increasingly scarce as the world focuses on the materials necessary for large scale electrification of transport for the low carbon economy of the future.

Australia’s advantages as a low cost supplier of energy and its raw materials are likely to be even greater after a successful global transformation to a low carbon economy than they are a world in which fossil fuels dominate energy supply.

Australia’s advantages in a low carbon global economy are extended by the developed world’s largest per capita opportunities for bio sequestration in various forms. Even more than in other countries, the struggle to find Australia’s appropriate place in a global mitigation effort is a struggle between the interests of the past and the present against the interests of the present and the future.

Over these past 28 months the international context of economic development and therefore of climate change policy has been transformed. Through late 2008 and early 2009 the world as a whole experienced a sharper nine month contraction of economic output and international trade than any since the emergence of capitalism. The great crash of 2008 left a legacy of slower growth, probably for a long time into the future in the developed world, but not in the developing countries. The major developing countries full participation in leadership became essential for any effective international cooperation. The immense challenge of climate change, the diabolical policy problem to which Michael referred, remained much as it was.

If there was a change in the climate change challenge it was the confirmation of the robust nature of the acceleration of economic growth in the developing world in the early 21st Century, the confirmation of the robust nature of what the review called “The Platinum Age”.

People in governments in many countries understand the importance of breaking the nexus between economic growth and greenhouse gas emissions. So why can't we solve the problem by each of us getting on with the job and reducing emissions to the best of our abilities? Why do we need international agreement? Some reductions in emissions below business as usual could be achieved by each country taking unilateral decisions, doing as much as its government judged to be fair. *The Review* described this as “the messy approach to mitigation”.

The international agreement embodied in the *Copenhagen Accord* and now *Cancun Agreements* is a strong version of this approach with important elements of international agreement supporting an approach to emissions reductions in each country. Success of this strong messy approach depends on transparency and commitments and their verification, on peer pressure across countries and on a degree of trust across the international community.

The Review argued that the messy approach was unlikely to achieve the emissions reductions that would be necessary to meet strong emissions objectives such as the goal of limiting temperature rise to two degrees which is now embedded in the *Copenhagen Accord* and the *Cancun Agreements*.

The central reason for needing an agreement is that it is probably essentially to breaking what I described as a “prisoner's dilemma” but in the absence of an explicit agreement each country will be tempted to do less than its share to free ride on other countries.

A second reason is that separate and non-binding decisions are unlikely to provide a firm basis for efficient trade in entitlements which would increase the costs of global mitigation and therefore reduce mitigation's ambition, especially in developing countries.

So *The Review* put the view that a strong and in the end, binding international agreement was going to be necessary to get all the way to strong mitigation, but it did note that on this issue there is a saving grace. There is exceptional community interest in and support for action on climate change mitigation in many countries. So it looks as if we can get further through the messy approach than we would have been able to on many other international issues.

The saving grace has been effective so far in the messy world after Copenhagen and seems set to assist international peer pressure in securing substantial progress across many of the major emitters.

I'd like to talk for a little while about implications for global emissions of Copenhagen and Cancun and this is presented in greater detail in the paper that will be distributed. The *Copenhagen Accord* for the first time brought together mitigation commitments and actions by developed and developing countries alike. The main distinction was that while developing countries pledged mitigation actions, developed countries were required to commit to quantified economy wide emissions targets. To date 85 developed and developing countries representing over 80% of global emissions and about 90% of the global economy have pledged targets and actions under the Accord. In addition, many countries have made pledges on specific goals such as renewable energy generation or forestry. The targeted changes in emissions can be compared to the emissions allocation entitlements under *The Review's* preferred modified contraction and convergence approach to allocating entitlements amongst countries within a global system of commitments that add up to a chance of stabilising atmospheric greenhouse gas concentrations at 450 parts per million or 550 parts per million.

Australia's pledged target range of Copenhagen is in line with *The Review's* recommendations, encompassing the range between a 450 parts per million and 550 parts per million objective. The pledges by the United States, European Union and Japan lie between *The Review's* 450 parts per million and 550 parts per million entitlements. Targets by Canada and Russia by contrast are less ambitious than under *The Review's* 550 parts per million scenario.

On average, developed countries pledged 2020 targets are somewhat less ambitious than called for under *The Review's* 550 parts per million scenario. *The Review* suggested approach on the basis of the data available and projections made then implied a targeted reduction in China's emissions intensity of 35% from 2005 to 2020. Thus China's pledge to reduce emissions intensity by 40 to 45% from 2005 to 2020 significantly exceeds what *The Review* saw as an adequate commitment for China under an ambitious global agreement.

For countries that have pledged reductions relative to a business as usual scenario, including Indonesia, Brazil, Mexico, South Africa and South Korea, assessments can be made by constructing business as usual scenarios, such analyses, for example that of Frank Jotzo to which I refer in the paper, have shown that if realistic baselines are applied, the Copenhagen pledges imply reductions in absolute emissions in these countries between 2005 and 2020. They would thus be significantly more ambitious than were called for in the

review up 'til 2020.

So I'd like to say a little bit more now about policies in selected countries of importance to Australia, and I'll focus especially on the United States and China because they are the world's two biggest emitters, but we shouldn't make the mistake of thinking of them as the whole world. I hope I'm not reinforcing that tendency by talking mainly about them today.

As with the Kyoto Protocol, countries which pledge targets or actions under the Copenhagen Accord were free to determine what policy measures they put in place to achieve their pledged targets or actions. Most developed countries have made significant process in establishing ambitious emissions targets and putting in place the instruments through which the desired outcomes will be achieved. More than 30 developed countries have introduced or are seriously considering introducing market based measures to help meet their emissions reduction targets affordably and efficiently.

Several countries carbon pricing mechanisms include design features that allow the rate of emissions reductions to be accelerated in the event that other countries take on more ambitious targets.

Australia, Canada and the United States have the highest per capita emissions of the developed world. The economic structure and pattern of political interests associated with exceptionally high emissions have made it difficult for these three countries to break away from old patterns of energy use, with the result that they have held back the global mitigation effort.

There's been a tendency for each to look the others for comfort in relation to underperformance on emissions reductions. The United States is obviously more influential in the smaller countries than the other way around, although Australians probably underestimate the extent to which their own discussions and decisions play into the American debate. Over recent months American officials close to the President of the United States have emphasised to me the significance of Australian progress in pricing carbon to the prospect for the use of economically efficient approaches to mitigation in their own country.

Australia as a close friend and ally of the United States, more than most developed countries, has good reasons to look beyond narrow and specific reciprocity on climate change policy with the United States. There are many areas of common interest in which the United States carries disproportionate cost. This is true of the two country's shared security interests. If it happened that in one area of shared interest climate policy, the United States government found it difficult fully to reciprocate an Australian contribution, it would be good

reason for Australians to accept this as part of a larger relationship from which it derives large benefits.

However, despite the considerable current domestic political difficulties on climate change mitigation policies, the United States is far from standing still. Though a shift to a global carbon market suffered a blow when the United States administration announced it would not pursue the passage of federal cap and trade legislation in 2010, there have been considerable developments with such market based instruments in many states, including the largest state California.

At the Federal level, the United States Environmental Protection Agency is pursuing aggressive regulatory measures such as tightening regulatory restrictions on emissions from vehicles and mandating the closure of the most heavily polluting of power stations. Strong support for low emissions sources of energy has been a feature of budget programs since the early stimulus packages in response to the 2008 financial crisis. The United States discussion is important globally and in Australian consideration of climate change policies, and is worth considering in detail.

In a big polity like the United States or China as I discussed below, cross currents and eddies inevitably complicate interpretations of developments in a complex and new area of policy.

We would be wise to recognise that the United States government, following the reputed scientific community in the United States, is working on the basis that climate change is a reality, that human activity is contributing influentially to it, and that in the absence of strong mitigation, the human community faces large risks of disruption to its economic and political life. This area of policy is every bit as difficult in the United States as in our own country.

There are participants in the political process rather more influentially than in the general community, and with only minor reinforcement from a few people with current claims on relevant scientific expertise, who deny the conclusions of the mainstream science or whether action is worth the cost.

United States officials at the highest level state that the emissions reduction target that the United States entered at Copenhagen and Cancun will be met despite the absence of a market based instrument for securing that result. They are supported in their statements about the targets by the slower economic growth that has followed the great crash - something that the United States government is working very hard to correct and we wish them well – that the government is supported in its emissions reductions ambitions by the gas revolution through which the competitive position of lower emissions gas has

been greatly strengthened against coal by an historically exceptional and rapid expansion in gas reserves, by productive responses to the heavy support for low emissions technologies that was part of the anti-recessionary stimulus packages, by extension of regulatory oversight of energy efficiency and emissions standards by Federal agencies including the Environmental Protection Agency, by many state based initiatives to establish emissions trading schemes and emissions reducing regulations, and by pervasive uncertainty about and expectations of future constraints on emissions that has inhibited investment in coal-based power generation in particular.

Independent organisations have assessed that established regulatory measures and other policies could in favourable circumstances reduce the United States emissions by up to 14% below 2000 levels by 2020. The United States government has pledged 17%, and these independent studies do not take account of the gas revolution.

The wide range of developments described above make it possible that the United States will achieve its 2020 emissions reduction targets despite the absence of economy wide passing of emissions. Of course, much will depend on the evolution of the national political balance in the years ahead.

Chinese climate change policy is at the centre of the international effort to reach global agreement because it is the world's largest source of greenhouse gas emissions, because it is by far the largest prospective source of emissions growth over the next two decades, and because economic and strategic competition between China and the United States is important in the policy dynamics of both countries.

Until about 2007 or 2008, China sat comfortably as one of the developing countries that faced no strong requirements to reduce emissions below business as usual. It supported the differentiated responsibilities of developing countries that had been agreed at Kyoto.

The Review put the view that there would be no effective global mitigation unless China moved the trajectory of emissions growth strongly below business as usual.

China took proposals for major reductions in emissions below business as usual to the Copenhagen meeting to reduce the emissions intensity of output by 40 to 45% from 2005 levels by 2020. China's most important emissions reduction measures have been regulatory with the authorities seeking to implement multiple environmental, energy security and other objectives by closing some and constraining other emissions intensive plants and industries.

There has also been substantial fiscal support to accelerate the deployment of a wide range of low emissions technologies in energy and transport. This was a focus of the stimulus package adopted in late 2008 and early 2009 in response to the Great Crash. For example, there was massive support for deployment of virtually all of the low emissions technologies; solar, wind, nuclear, biomass, hydroelectric. There was major investment in the electricity transmission grid to reduce energy losses and to facilitate integration of new sources of electricity. There was huge commitment to expansion of public transport within urban areas and extraordinarily rapid progress in developing 13,000 kilometres of fast train infrastructure to join most of the large cities of China.

There has been rapid reduction in the emissions intensity of coal-fired electricity generation. Environmentally damaging, unsafe and economically inefficient small coal-fired generators have been closed at the rate of one every one or two weeks, and replaced by larger and economically and environmentally much more efficient plants.

Not all of this went smoothly. There were examples of wind power capacity growing well in excess of the grid's capacity to use the product. There was criticism by economists of wasteful levels of subsidy for deployment of rooftop solar and electric cars, but the overall effect was transformative.

The Chinese economic policy authorities have been surprised by the rate at which the costs of the low emissions technologies have fallen. The costs of nuclear power have fallen so much that in coastal China where the coal alternative involves the import of expensive coal from Australia and elsewhere, or transportation of coal from the inland of China over hopelessly over-extended rail and road systems, nuclear is close to being economically competitive with coal, with the relative cost continuing to move in favour of nuclear.

The main constraint on expansion of nuclear at the expense of coal will soon not be cost directly, but anxiety about whether adequate supplies of high grade uranium oxide would be available to meet China's demands.

The costs of wind power have fallen by one fifth in two years, despite the general inflationary environment in China. Photovoltaic units have been falling rapidly in cost and being a younger technology, will continue to do so for some time.

What once seemed unattainable targets to Chinese economic authorities are now viewed with confidence. Officials have been pleasantly surprised at the rate of decreasing costs and are beginning to talk of reaching the high point of the emissions intensity reduction and then possibly going further.

China would not have committed itself to the targets offered under the Copenhagen Accord if they had been internally legally binding, but senior officials are now suggesting privately that China may strengthen the nature of its commitments in the context of stronger international agreement. I've got a little bit on developments in other major developing countries in my full paper.

Well where next for international action? It will take some time for the full implications of the change in the international regime to emerge. There will be international interest in and pressure on each major country's domestic commitments and progress towards their achievement. This interest and pressure will now join domestic political and economic pressures and create political dynamics that could raise the level of effort over time.

The current international agreement seems to have provided the basis for a substantial and favourable change in emissions trends. It has provided the arrangements within which the international community has agreed on a strong global objective. It seems to be capable of taking the international community further over the next few years.

But the real world of climate change is never simple. One ironic advantage of non-binding commitments is that they may lead to higher ambition. Binding commitments lead to greater caution to avoid the embarrassment and cost of non-compliance. China would have offered a lower commitment if had been formally binding. The United States may not have offered any commitment at all.

To continue to pursue as an urgent matter a binding outcome now, may actually lead to a perverse outcome where countries lower their ambition. In contrast with the non-binding targets, there is a possibility that as confidence builds, that mitigation is consistent with continued prosperity and strong economic growth. As new technologies and policy measures become available, more ambitious domestic mitigation goals will be offered.

Nevertheless, the judgement of *The Review* in 2008 still seems to be sound. It is unlikely that the world will achieve the two degrees or 450 parts per million objective, which is now part of the Copenhagen and *Cancun Agreements*, unless there is a comprehensive and binding international agreement on entitlements to emissions that adds up to the emissions constraints implied by that objective, and unless that agreement has the legal force to support economically and environmentally efficient trade in entitlements, there will need to be another change of gear in the global mitigation effort once confidence has grown that the current arrangements are delivering substantial results.

International trade in entitlements has the potential to reduce substantially the cost of mitigation for the world as a whole. This is going to be more important for Australia than for the rest of the world and it's one reason why Australia should be the last country to give up on the long term goal of a comprehensive binding global agreement. I say some things in the full paper are about the potential for regional agreements as transitional measures to provide many of the benefits of international trade in entitlements in advance of a truly multilateral binding agreement.

So we have an international agreement on climate change after Cancun and Copenhagen that is capable of supporting an historic change in trends on global emissions over the next few years. Whether this agreement is capable of evolving over time into an instrument for achieving the transformation that is required to hold global warming to near two degrees, will be revealed through the behaviour of many countries over the next few years.

The behaviour of Australia, the developed country with the highest per capita emissions, with the largest interest in early strong mitigation, and the best prospects for success in a future low carbon global economy, will have considerable influence. Australia will be influential because the developed countries with high per capita emissions will be expected by the rest of the world fully to contribute to the global effort. If they do not so contribute, this will materially weaken the commitments of others, especially in the developing world.

We and other developed countries can through inaction exercise a veto over effective global mitigation. Australia will also be influential because of the interests and structures and challenges that it shares with the developed countries of North America.

Australia can also be influential diplomatically. Something I don't make a point about in the paper, that I'd like to make reference to now is the effect of diplomatic contribution that Australia has made to the evolution of what we have after Copenhagen and Cancun. This was a point, the constructive role of Australia diplomatically that was made to us by senior people in both China and the United States. Amongst other things, officials in both countries gave Australian diplomacy good marks for the introduction of the idea of pledge and review that became important in the Copenhagen Accord.

Australia can also lead in another way without putting excessive burdens on its community, and that's by doing something that we've shown in a number of spheres that we can do well, work out economically efficient approaches to a hard policy problem, and if we succeed through this year in finding and putting in place economically and environment efficient methods for mitigation based

on economy wide carbon pricing, then that will be influential internationally and by reducing the costs of mitigation it will expand the feasible ambition of mitigation.

The surprising agreement that emerged from Copenhagen and Cancun is well suited to the geopolitical realities in the immediate aftermath of the Great Crash of 2008. It is in Australia's national interests for that agreement to evolve in ways that make it suitable as well for achievement of the deep cuts in emissions that are necessary to avoid high risks of dangerous climate change. Thank you.

Michael Wesley
Executive Director
Lowy Institute

Well Ross, thank you very much for a wide ranging and informative paper. Ladies and gentlemen, it's time for questions to Ross. Can I emphasise we won't be taking any statements. We are only interested in questions. But Ross, I might get things rolling by asking you a question about the two case studies you used, the United States and China.

To my ears at least it seemed that you described a political system that was struggling to come to terms with this diabolical policy problem, that of the United States and was muddling its way forward, and then you moved on to talk about a system that was coping what really sounded like quite efficiently, with the problem. You've just come back from the United States and China. Do you think China is going to be able to better cope with this problem and will this be the area where China emerges to global leadership?

Professor Ross Garnaut

The Chinese political system does find it easier quickly to change course, to take decisions that confront special interests in what the leadership considers to be the national interest. So, China does have some advantages, but also some quite large disadvantages in the Chinese political system. So I never would feel comfortable about comparison of the two systems, capacity to deal with one particular problem as suggestive of some general advantage.

There is a danger that the political systems of the democratic west will be seen amongst people who are making up their minds about choice of systems to not only on this issue, but on a lot of other big issues of the contemporary world, financial regulation, provision of infrastructure in large cities to not really be able to face up to their problems. There is a danger that our type of political system which I think is the best of all possible systems, will be judged unfavourably. I think that would be very unfair because our political system and the American political system don't have to perform as badly as they have done recently on this issue.

Question

Anthony Hopley. I'm the Global Head of Climate Change and Carbon Finance, international law firm Norton Rose. Two questions. There's a debate going on in *The Economist* at the moment about whether you lock in sort of transitional

technologies like gas and whether that's actually bad in the long run. You mentioned that. I'd be interested in your view on that. Secondly, William Hague was here a couple of weeks ago, the British Foreign Secretary, and he made a number of really interesting points, and I'd seen this when I was back in the UK in December. The UK is really looking to the sort of green economy, the low carbon economy as a way to get itself out of the economic crisis. The UK as a democracy like North America and Australia, but has been one of the first countries to enact a whole range of policies. He was pretty much praising the first mover position taken by the UK under the Labour government. So there was this sort of continuity from Labour to effect with the Conservatives.

With effectively a green revaluation lead by China that's taking place across Australia, do you see Australia effectively leaving itself out of that huge economic advantage which the UK is pursuing very aggressively?

Professor Ross Garnaut Two questions. In the very detailed modelling that I did for the original review, some of it with the Australian Treasury, we looked very carefully at the economically optimal transitions and there was a large place for gas in that transition. While the costs of other technologies are coming down, there is an advantage, especially in a country like Australia emerging as the world's biggest exporter of gas, not having to carry the large costs of liquefaction of transport of gas which our customers in north east Asia have to carry. There is a large advantage for Australia in using gas as a lower emission fossil fuel for some time.

The modelling showed that there comes a time when gas like coal runs into difficulty without carbon capture and storage. In the quite short term future the prospects of expansion of coal-based generation depend on success with carbon capture and storage, or some alternative mechanism for absorbing the wastes of combustion of carbon. Gas will eventually face that. In any economically efficient system, the price of emissions will be rising over time. There will come a time when that puts pressure on gas, but even knowing that, the modelling showed that in an optimal transition, there's quite a large place for replacing coal by gas for a considerable period.

Then William Hague's point about the leadership in the green economy. Our economic structure and our economic interests are not exactly the same as China's or Britain's or Germany's or Japan's or Korea's or America's. We are likely in the lower carbon global economy of the future to have the same basic advantage as we have in the high carbon economy of the past and that is access to low cost energy.

It's not very likely that in the near future we will emerge as a major supplier of capital goods to the low emissions industries, and when William Hague talks, when Barack Obama talks, when Jau Bau talks about the advantages of being

in front of the pack, what's on top of their mind is to be the first countries producing efficiently the capital goods, and already some developed countries have made big industries out of that, for example Denmark and Germany in export of highly efficient wind based capital goods for wind power.

So, we don't have that interest that Britain has, that Japan has, that others have. One day we might, but given our potential strength still for low cost generation of energy, it's more likely that our advantages will come through effective utilisation of a different set of low cost energy sources.

Now, there are advantages in being ahead of that game. Our modelling showed that with a rising carbon price sufficiently to reflect the social cost of carbon, that Australia very quickly loses any advantage it has had in the past in aluminium smelting because it's based on coal, but the advantage reappears later on if we play our cards right because we are a low cost supplier of alternative energies.

If people have confidence, if investors have confidence, if business has confidence that that later stage will be there, that we are investing in the innovation that will bring through these lower cost technologies, it's less likely that we'll go through an unnecessary adjustment, a winding down of some of the energy intensive industries that are not competitive for a while, but which have prospect for being competitive again in different circumstances at a later date.

Audience Professor Garnaut, Kevin Morrison from Argus Media. Can you just explain what's changed politically at the domestic level from your 2008 report, so when you handed it in at the end of the day when push came to shove, the Prime Minister of the day parked emissions policy to decide? What's going to happen this time or what do you see has changed if things do get tough politically again, that the present government will push emissions policy to decide yet again?

Professor Ross Garnaut I don't pretend any expertise in political analysis of that kind. I have been asked to do some additional work on what makes good sense for Australia in the Australian national interest. But one thing I think that has changed in the last couple of years is that quite a few Australians think that we didn't end up in a very good place last time. I'm expecting, I'm certainly hoping that realisation including in major parts of business, that it's not sensible for Australia to continue with a jerky ad-hoc approach to mitigation where we're actually adding quite a lot to cost but without doing very much to reduce emissions.

I think there's a fair bit of realisation that that's not an optimal path for us. So what I'm hoping is that we will have an opportunity in the rest of this year to focus analytically on the real consequences of doing things in different ways,

the real consequences of using economically efficient as distinct from ad-hoc and costly approaches to mitigation.

What the Australian polity decided last year is that governments are not going to be able to walk away from this issue. We will be in the game of mitigation. The question is whether we will be doing this in an economically and environmentally efficient way or not, and my work will seek to define, and I hope to explain effectively the economically and environmentally efficient approaches.

Question Jeff Miller. Really just a technical question. How long do you think it will be before carbon capture and storage is in effective real world use as opposed to being part of research projects in Australia?

Professor Ross Garnaut Well it's already being put on, on a very large scale in the Gorgon natural gas project Jeff, possibly the largest carbon capture and storage in the past. Up until then, when you produce natural gas, a lot of carbon dioxide comes out with the gas. From our high school chemistry we know that you can't turn carbon dioxide into a liquid. So as you liquefy the natural gas, the carbon dioxide is vented. You wouldn't want to carry it all the way to Shanghai or Tokyo even if you could turn it into a liquid. So you've got to do something with it.

In the past it's been vented at Gorgon and this is the result of regulation by the West Australian state government. They said "You can't do this project unless you capture and sequester the emissions." So they're reinjecting it into the structures from which it came. There's quite a few percent of Australian emissions involved in that single decision. So it's already working or being put into effect on a commercial scale, and it's important that we continue in those sorts of situations to take advantage of opportunities to avoid what in the past has been a major source of fugitive emissions.

The big question is when will it become economically efficient to, on a large scale sequester the carbon dioxide waste from coal combustion? The commercialisation of new technologies is a question involving great uncertainty. Whenever a business is introducing a new technology there are huge risks on being the first one to apply it on a commercial scale.

Now the minimum scale of economically efficient operation of carbon capture and storage for carbon combustion wastes is very large. The opportunity in Bass Strait and Gippsland where you have one of the most concentrated sources of carbon dioxide, the dirty coal of the Latrobe valley not very far from what on all accounts are some of the best sequestration sites on earth, if it's going to work anywhere in the world, it's quite likely to work there. But the scale of making it work is very large and it's very unlikely that a single business would

take the risks on that.

So this will be a question on which governments will need to put in place general systems of support for research, development and commercialisation of new technology for innovation. The first people to make commercial scale carbon capture and storage work will teach a lot to everyone else. They will certainly make mistakes, costly mistakes. The first user of any new technology always does. That's why it's a cliché of business. You don't want to be the first company to do any new thing, introduce any new technology, certainly in the engineering area.

So we might get our first commercial plants for carbon capture and storage from coal combustion at about the time when we've got an economically efficient system of public support for innovation in Australia.

Question Martin Wilder. Professor Garnaut one of the questions, there's a lot of talk at the moment about an international price per carbon, yet if you take what you described as the messy approach where different countries are developing different regimes, how do you get to an international price of carbon? So for example the Europeans have made it quite clear they won't accept forestry carbon which is a prime avenue of carbon under the CFI. Then we have with the CDM the split with HFC-23 credits. How do you in that more messy approach which you've been describing, get an international price of carbon?

Professor Ross Garnaut That's the big problem, the biggest problem of the messy approach. I can see the free rider problem possibly being resolved in a repeated game of everyone watching what everyone else is doing and gradually upgrading their effort. But without firm targets, then you don't have a basis for economically and environmentally efficient trade in entitlements, and Australia would get very large benefits from access to that international trade. So it's why I emphasised the importance of keeping in mind the long term goal of such an agreement as a basis for international trade.

Now, there will be some quite large parts of the world with a real carbon price, like Europe. Now Europe will be able to trade at its price on rules that it determines. So that will be the centre of some trading opportunities. There's discussion in New Zealand which already has an operating [54:10] linking to the European scheme for example.

For Australia, where these opportunities are so large, it's worth our putting a fair bit of effort as an interim measure prior to the establishment of a multilateral system of entitlements, of binding entitlements, for Australia putting effort into seeing whether it can build an economically and environmentally efficient

regional system for trade entitlements.

Question I have seen reported you mentioning about changes of lifestyle and reduction of meat consumption in the western world which is quite excessive, but this aspect does not get much airing in the media and elsewhere, although it is a very important aspect for sustainability of food supply for increasing world population. Can you please comment on this aspect?

Professor Ross Garnaut Yes. In my original Review and I haven't had reason to change my mind, I took the view that we will not get a result, or at least we won't get an acceptable result. If it depends on asking any of the communities on earth to accept a radically reduced standard of living, the key to success in this endeavour is going to be breaking the nexus between living standards and high emissions, and *The Review* showed that there are ways of doing that.

We won't get there rapidly without an awful lot of innovation and so the two instruments that are really important in Australia and elsewhere will be a carbon price and support for innovation. But I think that realistically for good or real, that has to be the path rather than asking the richer people of the world to consume much less because they're not likely to do so.

Question Good afternoon Professor Garnaut. Matthew Knott from Crikey. You talked at the end of your presentation about the influence Australia can have on other country's progress, but as you mentioned in the paper, Australia's pledges that Copenhagen were largely conditional on what other countries do with only a unilateral target of 5%. Do you think that's appropriate for Australia to base their targets on what other nations do or is that just putting us in the passenger seat?

Professor Ross Garnaut I think we take a big step forward if we contribute proportionately because up 'til now we've been contributing much less than proportionately. So the first step is to get Australia up to what other countries are doing, on some sort of average, not picking the worst performer in the rest of world and comparing ourselves with that, but honestly and objectively reviewing what would be a proportionate position from Australia's part.

So at the moment or up 'til now, it's only through the last 10 years Australia's been a significant drag on the global effort. We would cease to be a drag if we came up to an average sort of effort. So don't knock that. Stopping being a drag is a big step forward for Australia.

A second point is if we're doing something that's proportionate in relation to the world as a whole, we might be helpful to our friends in North America in arguing

the case for their succeeding in doing what their governments want to do.

Thirdly, and this is an area which I emphasised, but I think there's real opportunity for leadership by Australia and that is if we can find economically and environmentally efficient ways of reducing emissions, then putting those in place will carry their own arguments for others to do things in a similar way, and the more we can reduce the costs of a certain amount of mitigation, the more ambitious that our communities will be prepared to be about mitigation. So I think us doing it right with an economy wide price on carbon, with efficient support for innovation, could turn out to be a very important contribution of leadership to the international system.

Question Tony Mohr from the Australian Conservation Foundation. In your 2008 Review you made recommendations that Australia should place conditions on its targets, on our proportional effort. Some of those conditions weren't just about how much was actually being done by the countries, but what level of international progress was being made. The Australian government had its own more elaborate set of conditions. Do you in this sort of strong messy world see a cause or a reason to revise those conditions, perhaps be a little bit more lenient of the situation in the US of the level of progress that's happening in different nations outside of the UN?

Professor Ross Garnaut Yeah. Certainly that's something I'm looking at Tony, and if the evidence is there of on average, countries are doing something that would justify a larger effort than the minus five, then the Australian government's own commitment at Copenhagen carries some implications.

I'll be discussing all of that, but I think it's a really important step for Australia to put in place some efficient mechanisms for starting to move forward. We're talking about pledges of emissions reduction by 2020. The Australian community will feel more comfortable about more ambitious pledges once we've started a process and so in my final advice on pricing of carbon, obviously I'll have to say something about where we sit proportionally and the implications of that for pricing of carbon, but I'll very much have in mind the importance of making the sort of start that we haven't been able to make up 'til now.

Michael Wesley Ladies and gentlemen, sorry to those who didn't get to ask a question. I'm
Executive Director afraid that's all we have time for today. Ross, thank you for a rich and broad
Lowy Institute ranging discussion today. There are certainly some reasons for sober policy
analysis in what you had to say, but there's also reasons for some hopeful
elements in what you had to say. So this is surely going to be one of the
political issues of this year. So ladies and gentlemen, please join me in thanking

Ross Garnaut.

- ENDS -

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