

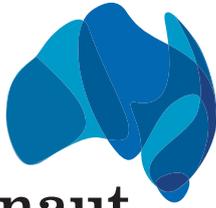
Garnaut

CLIMATE CHANGE
REVIEW UPDATE 2011

Australia in the Global Response to Climate Change Summary

31 May 2011





Garnaut

CLIMATE CHANGE REVIEW UPDATE 2011

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Garnaut Climate Change Review – Update 2011
Australia in the Global Response to Climate Change
Summary

Ross Garnaut

Includes two Supplementary Notes:

A 10-year plan for carbon pricing revenue

Governance arrangements for Australia's carbon pricing scheme

31 May 2011

www.garnautreview.org.au

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About the Review Update 2011

The **Garnaut Climate Change Review** was commissioned by the Commonwealth, state and territory governments in 2007 to conduct an independent study of the impacts of climate change on the Australian economy. I presented *The Garnaut Climate Change Review: Final Report* to the Australian Prime Minister, Premiers and Chief Ministers in September 2008 in which I examined how Australia was likely to be affected by climate change, and suggested policy responses.

In November 2010, I was commissioned by the Australian Government to provide an update to the 2008 Review. In particular, I was asked to examine whether significant changes had occurred that would affect the analysis and recommendations from 2008.

My book, *The Garnaut Review 2011: Australia in the Global Response to Climate Change*, is the final report of the update. This summary of the book brings together some of the main ideas and recommendations from the book. This follows seven months of careful research, analysis, expert studies and consultation, which have examined major developments in the past three years in the climate science, global greenhouse gas emissions, international progress on climate change mitigation, Australia's land and electricity sectors, innovation and technology, and carbon pricing. Eight detailed update papers were released between February and March 2011.

Included in this summary are two supplementary notes: *A 10-year plan for carbon pricing revenue* and *Governance arrangements for Australia's carbon pricing scheme*.

The eight papers, supplementary notes, the book and supporting information can be found on the Garnaut Climate Change Review website at www.garnautreview.org.au.

Introduction

The 2008 Garnaut Climate Change Review compared the costs and benefits of Australia taking action to reduce the damage of climate change caused by humans. It concluded that it was in Australia's national interest to do its fair share in a strong global effort to mitigate climate change.

The 2008 Review accepted the central judgments from the mainstream science about the effects of changes in greenhouse gas concentrations in the atmosphere on temperature, and about the effects of temperature changes on climate and the physical earth. I formed the view that the mainstream science was right 'on a balance of probabilities', and that errors were as likely to be in the direction of understatement of damage to human society as in the direction of overstatement.

I used the results of the science to inform a model of the impacts of climate change on the Australian economy, including impacts on agricultural productivity, our terms of trade, and infrastructure. The model included links to the global economy and was based on Australia doing its fair share in a global effort to reduce the damage from climate change.

The modelling showed that the growth rate for Australian national income in the second half of the 21st century would be higher at the end of the century with mitigation than without. The present value of the market benefits this century fell just short of the value of the costs of mitigation policy. However, when we took account of the value of Australians' lives beyond the 21st century, the value of our natural and social heritage, health and other things that weren't measured in the economic modelling, and the value of insuring against outcomes that were worse than the average impacts assumed in the modelling, strong mitigation was clearly in the national interest.

The Final Report

The *Garnaut Review 2011: Australia in the Global Response to Climate Change* examines how developments in science, diplomacy, political culture and the economy have affected the national interest case for Australian climate change action.

My book is the story of Australia's national interest in contributing our fair share to a global mitigation effort. It is a story of how market-based approaches to mitigation can bring out the best in Australians, and a return to regulatory approaches the worst. Both best and worst lead us to the same conclusion: that a broad-based market approach will best preserve Australian prosperity as we make the transition to a low-carbon future. Annex A to this summary lists the central elements of my policy recommendations.

The first supplementary note, *A 10-year plan for carbon pricing revenue* (Annex B), provides further detail about the expected revenues and the recommended allocation of funds generated by the carbon pricing scheme. The second supplementary note, *Governance arrangements for Australia's carbon pricing scheme* (Annex C), provides further detail about the institutional and administrative arrangements required to maximise the stability and efficiency of the scheme and underpin community and business confidence.

PART I: THE GLOBAL SHIFT

1. Beyond reasonable doubt

Since the 2008 Review, the science of climate change has been subjected to intense scrutiny and has come through with its credibility intact. Unfortunately, new data and analysis generally are confirming the likelihood that outcomes will be near the midpoints or closer to the bad end of what had earlier been identified as the range of possibilities for human-induced climate change.

I noted in the 2008 Review the curious Australian tendency for dissenters from the mainstream science to assert that there is no upward trend in temperature, or that if there had been a warming trend it has ceased or moved into reverse. Such assertions were prominent in some newspapers and blogs, but also appeared in serious policy discussions. The assertions were curious because the question of whether the earth is warming or not is amenable to statistical analysis.

It so happens that answering questions of this kind comes with the professional kitbag of economists who work on statistical analysis of series of data that cover periods of time. For the 2008 Review, I asked two leading Australian econometricians who are specialists in this area, Trevor Breusch and Fashid Vahid, to analyse the data on temperature. Their conclusion was clear. There is a statistically significant warming trend, and it did not end in 1998 or in any other year. I had the analysis repeated with three more years of data for this book, with the same conclusions.

Since 2008, advances in climate change science have broadly confirmed that the earth is warming, that human activity is the cause of it and that the changes in the physical world are likely, if anything, to be more harmful than the earlier science had suggested. I have replaced the premise of the 2008 Review that the reputable science was right ‘on a balance of probabilities’, with the premise that it is ‘beyond reasonable doubt’.

2. Carbon after the Great Crash

Chapter 2 focuses on the likely amounts of greenhouse gas emissions in the absence of mitigation. It examines the effect on emissions of the big global economic developments following the global financial crisis—the Great Crash of 2008.

Emissions under business as usual are on a somewhat lower trajectory in the developed countries, mainly as a result of the loss of growth momentum after the Great Crash. This is roughly balanced in the period to 2030 by continued strong growth in the developing countries. Seventy per cent of global emissions by 2030 would come from developing economies. The result is a global emissions trajectory in the event of business as usual that is little changed from 2008, but is constitutionally very different.

The shift of the centre of gravity of growth towards developing countries is wonderful for human wellbeing so long as we can manage the consequence: that mitigation becomes more difficult. However, there has been a major positive development. The world has already moved considerably beyond the business-as-usual approaches to emissions reduction.

Australia is an exception among the developed countries. We stand out as the developed country whose anticipated business-as-usual emissions growth bucks the general trend of developed countries, largely as the result of the expansion of the role of resources in the economy. The projection of Australia’s emissions trajectory without mitigation to 2020 has grown to 24 per cent above 2000 levels—4 per cent above the levels expected in 2007—despite new policy measures in the intervening years. This will not be easily understood by other countries and is likely to bring Australian mitigation policy under close scrutiny.

3. What's a fair share?

Chapter 3 examines important developments in the global framework for action that give hope of holding global emissions to levels that avoid dangerous climate change.

Against all the odds, there is an international agreement on mitigating climate change. The world is on its way to substantially reducing emissions growth.

The 2009 Copenhagen and 2010 Cancun conferences of the United Nations Framework Convention on Climate Change led to an important new direction in global mitigation policy. The diplomatic fiasco of the Copenhagen conference disguised a breakthrough new agreement that addressed the great failing of the Kyoto Protocol. It incorporated mitigation targets for the United States and the large developing economies, notably China. All countries also agreed to contain global warming within 2°C.

The meeting at Cancun consolidated and extended the new agreement, as well as the mitigation targets pledged by developed and developing countries.

The ranges for the United States, the European Union and Japan together correspond to entitlements for the early stages of a moderately ambitious—if not strong—global agreement. On average, developed countries' pledged 2020 targets are somewhat less ambitious than are needed to hold the concentration of greenhouse gases in the atmosphere to 550 parts per million (ppm) of carbon dioxide equivalent.

Meanwhile, China—the world's largest emitter—has gone further than expected in 2008. At Copenhagen and Cancun, China pledged to reduce its carbon intensity by 40 to 45 per cent between 2005 and 2020—beyond the reduction that the Review had suggested would be required by China (35 per cent) if global concentrations of carbon dioxide were to be limited to 450 ppm. China has already achieved considerable success in the implementation of its pledged targets with sweeping regulatory actions in energy and innovation. Chinese leaders have been pleasantly surprised at the pace and cost of change and are growing in confidence that they will later be in a position to offer more aggressive pledges still.

In this new world of concerted unilateral action, countries closely examine each other's efforts to confirm that each is contributing its fair share. Freeloading may contribute in only a small way to overshooting global targets, but it threatens the entire global effort as all countries look to one another for reassurance that the pledged progress is being made.

While both developed and developing countries must enter commitments to constrain emissions, a distinction can be drawn on the way those constraints are set. An international agreement can work with developed countries accepting targets for absolute reductions in emissions, and developing countries targets for reductions in emissions intensity. What is missing are rules for the transition of a country from developing to developed status.

I suggested in the 2008 Review that the transition can take place when a developing country's emissions per person reach the (falling) average level of developed countries. That still seems practical as well as ethical.

4. Pledging the future

To date, 89 developed and developing countries, representing more than 80 per cent of global emissions and about 90 per cent of the global economy, have pledged large cuts and actions under the Cancun Agreements. The pledged target ranges for the United States, the European Union and Japan all correspond to entitlements for a global agreement between 450 ppm and 550 ppm (see Table 4.1).

The targets pledged by Canada and Russia, by contrast, are less ambitious than suggested for a 550 ppm global agreement. And, on average, developed countries' pledged 2020 targets are somewhat less ambitious than are needed under a 550 ppm scenario.

Table 4.1: Comparing the Cancun Agreements pledges and notional entitlements under the 2008 Review's modified contraction and convergence framework

Country or region	Target type	Cancun pledges: change in absolute emissions at 2020 relative to 2000 ^a	Garnaut Review (2008): emissions entitlement allocations at 2020, relative to 2000-01	
			550 scenario	450 scenario
Australia	Reductions in absolute emissions	-5% to -25%	-10%	-25%
Canada		-13%	-33%	-45%
European Union		-12% to -23%	-14%	-30%
Japan		-33%	-27%	-41%
New Zealand		-27% to -35%	n.a.	n.a.
Russia		+15% to +31%	n.a.	n.a.
United States		-16%	-12%	-28%
<i>Weighted average of developed countries</i>			<i>-10% to -16%</i>	<i>-15%</i>
		Cancun pledges: reduction in emissions intensity, 2005 to 2020	Garnaut Review (2008): reduction in emissions intensity 2005 to 2020, applying the Review's suggested approach^b	
China ^c	Reductions in emissions intensity (ratio of emissions to GDP)	-40% to -45%	-35%	
India		-20% to -25%	-43%	

Note: this is Table 4.2 in *Garnaut Review 2011: Australia in the Global Response to Climate Change*, p.51. For developing countries, fair shares are measured in reductions in emissions intensity.

^a Computations for developed countries (absolute targets): Countries' targets are converted from their chosen base years (see Table 3) to the 2000 base year used by the Review using estimates of total greenhouse gas emissions, excluding emissions from bunkers and land-use, land-use change and forestry (World Resources Institute 2011). The base year adjustment accounts for divergences from countries' submitted pledges as listed in Table 3, including the large divergence for Russia due to significant reductions in emissions between 1990 and 2000.

^b Computations for China and India (emissions intensity targets): Applying the Review's rule of emissions entitlements growing at half the rate of GDP growth for the period 2013-20 to the GDP growth assumed in the 2008 Review, in line with China's and India's pledges. The difference in required emissions intensity reductions between China and India is because of different rates of change in emissions intensity during the 2005-12 period which are carried forward in an assessment under the Review's proposal. If the Review's rule of half the rate of GDP growth had applied from 2005, the 2005-2020 reductions in emissions intensity would have been 44 and 43 per cent respectively.

^c China's Emissions intensity target only applies to carbon dioxide emissions.

While the US scientific community was instrumental in placing the global warming issue on the international policy agenda, Europe is at the forefront of policy action. Denmark, Finland, Norway and Sweden were the world's first movers on substantial climate change mitigation policy, pricing carbon since the early 1990s. The European Union established an emissions trading scheme in 2005 and has steadily tightened its parameters since then. Half the people in the developed world—half a billion

people—are covered by the European Union’s emissions trading scheme. In May 2011, the UK government announced new emissions reduction targets—50 per cent from 1990 levels by 2025—that are binding under domestic law.

A number of major developing countries have pledged reductions relative to a business-as-usual scenario (including China, Indonesia, Brazil, Mexico, South Africa and the Republic of Korea). Analyses of plausible business-as-usual scenarios have shown that, if realistic baselines are applied, the Cancun pledges imply reductions in absolute emissions in these countries between 2005 and 2020. These, too, are as ambitious—or more ambitious—than were called for under the modified contraction and convergence framework developed and proposed in the 2008 Review.

Australia’s fair share

The Australian Government and Opposition accepted the 2008 Review’s proposal that Australia should reduce emissions by 5 per cent in 2020 from 2000 levels whatever the rest of the world was doing as our contribution to keeping hopes for a strong international agreement alive. The Review recommended—and the government accepted—that Australia should also make pledges of stronger commitments calibrated to what other countries were doing. Australia should offer to reduce 2020 emissions by 25 per cent from 2000 levels in the context of a strong international agreement focused on holding concentrations at 450 ppm or the temperature increase to 2°C. If the world had reached effective agreement on emissions reductions that would lead to concentrations of 550 ppm, our fair share would, in my judgment, be 10 per cent. Given our starting point, the realistic ambition is to catch up with our fair share, rather than to be a leader.

The range for conditional targets recommended in the 2008 Review and accepted by the Australian Government still seems appropriate. The time to adjust targets would be following the government’s receipt in 2014 of the first report of the proposed independent committee (see Chapter 5). It would be appropriate for the target to be the percentage reduction of emissions which, within a contraction and convergence framework leading to equal entitlements per person in 2050, represents the average percentage reductions of the developed countries. The average would be weighted by population. The percentage would be based on pledges but adjusted for evidence of underperformance or overperformance against targets. The calculations would presume (as is currently the case) that the pledges of major developing countries add up to an equivalent reduction of emissions within a modified contraction and convergence framework. If they do not, there can be an appropriate adjustment of the target.

There is a long way to go before the prospective costs of dangerous climate change have been reduced to acceptable levels. Success will come from building on current achievements of the international system, and not from starting again. Australia’s strong national interest in effective mitigation is served by helping to make the emerging arrangements work.

PART II: AUSTRALIA’S PATH

5. Correcting the Great Failure

Developments in science, global emissions profiles and shifts in the structure of global climate change agreements have all strengthened the national interest case for a stronger Australian mitigation effort.

An historic choice confronts Australia now in its goal to reduce greenhouse gas emissions. What domestic policy response should we take? Once we know what our fair share is in the global effort to reduce greenhouse gas emissions, we can work out how to do it at lowest cost. There are two basic approaches to achieving the required emissions reduction: a market-based approach, built around putting a price on carbon emissions; and a regulatory approach, or direct action.

In the market-based approach, carbon can be priced in two ways. Fixed-price schemes, or carbon taxes, set the price and the market decides how much it will reduce the quantity of emissions. Floating price schemes set the quantity of emissions and permits to emit are issued up to that amount. The permits are tradeable between businesses and so the market sets the price. There are various hybrid approaches that combine fixed prices for a period with floating later on, and floating prices at some price levels with a price floor or a price ceiling or both.

In the alternative route, regulation or direct action, there are many ways that government can intervene to direct firms and households to go about their business and their lives.

Chapter 5 explores these options and argues for a three-year fixed carbon price followed by a carbon trading scheme with a floating price. This confirms the approach proposed in the 2008 Review for circumstances similar to those in which we now find ourselves. This is Australia's best path forward towards full and effective participation in humanity's efforts to reduce the dangers of climate change without damaging Australian prosperity.

The introduction in 2012 of an emissions trading scheme with a fixed price on carbon for three years and then a floating price incorporating the targets that are appropriate at that time would give us good prospects of doing our fair share at moderate cost.

The introduction of the emissions trading scheme with an initially fixed price, and the subsequent movement to a floating price, will be important but not disruptive events in the structural evolution of the Australian economy.

Both the Australian Government and the Opposition have committed themselves to a minimum reduction of emissions of 5 per cent from 2000 levels by 2020. The targets would be tightened as other countries became more ambitious in reducing emissions. Carbon prices would rise on international markets and that would be reflected in the Australian price. There would be certainty for business about the process, although the carbon price would change over time. But price fluctuations are the kind of uncertainty with which business is familiar—like the uncertainties in commodity and financial markets that are managed in the normal course of business.

As soon as the parameters of the scheme are settled, business will focus on making money within the new rules, rather than on securing rules that make them money. That makes it essential that the rules really are settled. The governance arrangements proposed for the carbon pricing scheme are the key to establishing settled rules: the independent carbon bank to regulate the scheme; the independent climate committee to advise on targets and the transition to a floating price regime; and the independent agency to advise on assistance to trade-exposed industries. Refer to Annex C for further detail on proposed governance arrangements.

Trade in entitlements would begin the convergence towards similar carbon prices across many countries. New regional trading arrangements might emerge. Each member of a regional trading arrangement of which Australia was a participant would be free to sell and buy entitlements with others so that carbon prices for our region would move closer to those elsewhere. Confidence would grow that trade-exposed industries were facing similar carbon constraints in many countries. It is likely that countries that initially chose not to take part in international trade, but which were meeting commitments to reduce emissions, would be imposing at least similar costs on their trade-exposed industries.

6. Better climate, better tax

One distinct advantage of reducing emissions through a market-based carbon price is that it raises considerable revenues. These can be used to buffer the transition to a low-carbon economy.

A carbon price of \$26 will raise approximately \$11.5 billion in the first year (2012-2013). Chapter 6 presents the outcome of a national interest analysis of how compensation should be deployed.

The amount of revenue rises with the carbon price, but falls as emissions decrease. The revenue from a carbon price is expected to rise for a decade or so. In the longer term, the revenue from a carbon price will stabilise and then start to decline as a result of steady falls in emissions eventually overcoming the rise in permit prices. A carbon price has some short-term negative effects on productivity growth and incomes—although less than direct action that secures similar reductions in emissions.

Efficiency and equity objectives would be well served by allocating much of the revenue to reducing personal income tax rates on households at the lower end of the income distribution. Such an adjustment would increase incentives to participate in the labour force at a time when Australia faces shortages of labour and inflationary pressures.

For those low-income households that do not stand to benefit from tax cuts, adjustments could be made to indexation arrangements for pensions and benefits that protect against disproportionate increases in the prices of particular goods and services that these households consume in unusually high proportions. Full compensation and not overcompensation should be the objective.

Any additional inequities would need to be corrected by targeted support for households with exceptional energy requirements for health and other reasons.

Part of the revenue should be used for firms or the carbon pricing scheme regulator to purchase carbon credits from the land sector. There is also a strong case for returning some of the carbon revenue to the business sector in support of innovation in emissions-reducing technologies.

There is a case for assisting the trade-exposed industries to an extent that offsets the effects on product prices of other countries having carbon constraints that impose lower costs than Australia's.

Agriculture and the land sector will not be comprehensively covered by carbon pricing in the early years. There are large advantages in allowing genuine sequestration in the land sector to be rewarded at the carbon price, whether or not that is currently allowed under the international rules developed at Kyoto and currently under discussion with a view to modification. There is great uncertainty about the claims that the land sector may make on carbon revenue, but they are potentially large. Chapter 10 suggests that, pending full coverage of the land sector in carbon pricing, provision be made for a proportion of the carbon revenue to be allocated for land sector credits.

Public funding of low-emissions innovation over the medium term is necessary to compensate for the external benefits deriving from a private firm's investment in innovation, at a time when there is a high value in accelerated development of new, low-emissions technologies. Chapter 9 explains the case for public funding of innovation in low emissions technologies to rise to about \$2.5 billion a year for policies across the innovation chain. The government is currently allocating about three-quarters of a billion dollars a year to innovation in low-emissions technologies through the three-year forward estimates and beyond. This funding will presumably continue, so that the carbon pricing package has to fund only the increase above three-quarters of a billion. Refer to Annexes B and C for further detail.

7. The best of times

As clear as the case for carbon pricing may seem, the political basis for such policies has weakened since 2008. Alongside the central discussion of climate policy, this book is a guide to another struggle that is deeply colouring the climate change debate—the struggle between special interests and the national interest.

This conflict is not new. Indeed, it is always with us, and always will be. But there are periods when the special interests have had the strongest hold on policy, and others in which policy making is strongly grounded in the national interest. This is the problematic political context of the climate change policy discussion.

Chapter 7 examines this phenomenon and notes that in a political economy already dominated by vested interests, a transparent, market-based carbon price is far less likely to be unduly influenced by private interests than a regulatory approach which provides recurring opportunities for lobbying. A market-based approach will, for this among other reasons, cost Australians substantially less.

An emissions trading scheme, initially with a fixed price on carbon, will be introduced at a time of great prosperity in Australia—a time of full employment but also of emerging structural pressures from the resources boom. With Australia's exchange rate against the US dollar at its highest level in about 30 years and its real (inflation-adjusted) exchange rate possibly the highest since Federation, we are living through the largest reallocation of resources outside the two world wars in our national history.

Developing countries' accelerated global industrial development will drive and restructure the Australian economy in the years ahead. There will be bumps in the road—but these will probably be less painful than they would have been in any other circumstances. And the bumps will be on a road that is, for the foreseeable future, heading in directions that are favourable for Australia, determined by the concentration of global growth in economies that are highly complementary to Australia, and in our neighbourhood.

It makes no sense to resist this change with policies that seek to hold in place the structures of the past. On the other hand, it makes good sense to ensure that policies pursuing different objectives are all consistent with continued increases in productivity and rising living standards after the current resources boom has run its course. That means adopting approaches to reductions in greenhouse gas emissions that have the lowest possible costs.

8. Adapting efficiently

Chapter 8 looks at the likely adaptation measures that will be required in Australia. The key to success and greatest efficiency will be maintaining a productive, flexible, market-oriented economy. The best of mitigation will leave Australians dealing with a lot of climate change. They will have no choice but to adapt.

But to what will they be adapting? While the climate outcomes from the Cancun Agreements cannot be defined even in broad brush because they say nothing much about what happens after 2020, Chapter 4 suggests that they could lead to atmospheric concentrations of greenhouse gases of 550 or 650 parts per million—most likely leading to temperature increases of 3°C or 4°C. It is still possible that the Cancun pledges could evolve into a set of commitments that achieves the Cancun temperature objective of 2°C. And it is not impossible that future Australians could face an increase in global temperature of 6°C or more.

We are already feeling some impacts of climate change when the increase so far is less than 1°C since pre-industrial times. How will Australians in future manage 2°C, which for the moment seems a lower bound on a wide range of possibilities? Even an increase of 2°C above pre-industrial levels would have significant implications for the distribution of rainfall in Australia, the frequency and intensity of flood and drought, the intensity of cyclones and the intensity and frequency of conditions for catastrophic bushfires.

There are two main building blocks for a productive response to the adaptation challenge. The first is to make sure we have a strong, flexible economy, with smoothly functioning markets. Australians in future

will do better if they are working with a productive economy, which is in a strong fiscal position in preparation for a shock, and has the structural flexibility that comes from well-regulated markets. These strengths are the less likely to be tested beyond their limits the more effective global action has been in constraining climate change.

The second is to make sure we have sound information about possible impacts of climate change on various regions and activities and that information is disseminated in easily useable forms. Informed people and enterprises and governments at all levels will see problems in advance and develop low-cost responses to them. On the other hand, people and firms and governments responding to crisis will make decisions without the benefit of long reflection and consideration of alternatives to what the crisis seems to demand. We have made progress on building our national strengths in climate change science since the 2008 Review. This work is of great importance for effective adaptation to a changing climate. The Climate Commission, an independent body set up in early 2011 to provide reliable and authoritative information on climate change, and to inform the debate on this issue of national significance, is young in its responsibilities. It would be of great value if it evolved as a trusted channel of communication from the scientific community to the general public. It would also be of great value if it evolved into a source of information for government.

These two building blocks are the most valuable things that we could bequeath those who come after us as they do their best in a world of climate change. Adaptation policy is first of all about doing these things well.

PART III: AUSTRALIAN TRANSFORMATIONS

9. Innovation nation

How much the transition costs depends on Australians' success in innovation. The carbon price will make it profitable to do new things in new ways. Some Australian businesses and individuals will do those things and fund those ways, and others will learn from them. We need a lot of technological change over a short period of time. Chapter 9 discusses policies to make sure we get it. The effect of the carbon price upon the two industry sectors that are most enmeshed by climate change and mitigation—agriculture and electricity—are covered in chapters 10 and 11.

The central policy instrument to encourage the use of established low-emissions technologies and to discover and to apply new technologies is carbon pricing. Putting a price on carbon increases the profitability of investment in innovation.

The carbon price alone will not, however, lead to adequate investment in research, development and commercialisation of new technologies, because the private investor can capture only part of the benefits. Fiscal incentives can bridge the gap between benefits to the whole of society and benefits to the individual investor in innovation. Part of the carbon pricing revenues—on the plateau of expenditure between about five and ten or twelve years from the commencement of carbon pricing, about \$2.5 billion per year of the Australian revenue—can be used productively for this purpose.

Support for innovation should extend from basic research and development to the demonstration and commercialisation of new technologies. The basic research will be conducted mainly but not only through public institutions. It requires decisions on allocations of expenditure according to assessments of Australia's comparative advantage in research capabilities, and national interest in successful outcomes. At the commercialisation end of innovation, allocations are best guided by private priorities backed by private commitments of funds, in the form of matching grants or other benefits from government.

10. Transforming the land sector

The Australian rural sector will be challenged greatly by climate change, which will generate higher prices for farm products but place barriers against making good use of them. A world of effective global mitigation would provide many opportunities for Australian farmers, as they would be in a better position to take advantage of higher world prices resulting from other developments in the global economy.

Farmers are naturally anxious about the costs that they will bear as a consequence of Australia doing our fair share in strong and effective global mitigation. Like all Australians, and more than most, they will contribute through higher costs of fuel and transport. Like all Australians, they will be beneficiaries of adjustments to tax and social security that emerge from the allocation of revenue from carbon pricing. The rural community, like all Australians, will be intensely interested in the details of the allocation of increased costs and tax cuts associated with the introduction of carbon pricing.

The 2008 Review recommended that the land sector initially be brought within incentives to reduce emissions through offsets, and brought within an emissions trading scheme once issues regarding emissions measurement, estimation and administration are resolved. The proposed date for inclusion of New Zealand agriculture (2015) is a good time for a review of whether circumstances have changed enough for Australia to have full coverage of the land sector.

The land sector, especially through biosequestration, has immense technical potential for reduction and absorption of emissions. Farmers should be able to sell the full range of legitimate biosequestration credits into the carbon pricing scheme, providing the basis for a new industry of considerable potential. For activities that are currently recognised for Australia under the international rules, credits could be sold to parties that were liable under the scheme. For other genuine biosequestration, the regulator of the carbon pricing scheme would purchase credits at the carbon price. Sales of land-based credits under these arrangements would be placed under generous quantitative limits, as described in Annex B. These quantitative limits would be removed when there was full coverage of land sector emissions under the scheme.

Realising a small proportion of the land sector's biosequestration potential through providing incentives commensurate with the sector's mitigation contribution would transform the Australian mitigation effort. It would also greatly expand the economic prospects of rural Australia. Complementary incentives for biodiversity would help to ensure that the potential for carbon and biodiversity efforts to assist each other is realised.

We are a long way from knowing how much of the technical potential can be realised economically. Linking the government's proposed Carbon Farming Initiative, an offset program targeted to begin from July 2011, with the carbon pricing scheme would open the way to realisation of that potential and is an essential modification. The Carbon Farming Initiative would reveal the potential and define the extent to which it is economically relevant; it does this by providing for the emergence of an offset market for land sector abatement. In time, as the world shifts towards pricing carbon in farming, the Carbon Farming Initiative can be merged with the broader carbon price and fulfil its full mitigation potential.

11. Electricity transformation

The transformation of the electricity sector has to be at the centre of Australia's transition to a low-emissions economy for this reason, and also because the lowest-cost path to reducing emissions in the transport, industrial and household sectors involves greater use of low-emissions electricity.

A carbon price will be the main driver of transformation of the electricity sector. It will alter electricity production and consumption—but it is neutral as to how this change is achieved. In some cases the carbon price may drive new investment in low-emissions generation—whether large or small scale. It

may lead to fuel switching, so that established generators with high emissions run less intensively and generators that use lower-emissions fuels run more of the time. Or it may lead to the adoption of practices that lead to lower emissions from existing plants and fuels.

There will be some reduction in demand—the overseas studies suggest a 3 per cent fall in demand in the short term after a 10 per cent increase in price, and a 7 per cent increase in the long term. The easing of demand growth as prices have risen in recent years suggests the potency of these effects. Both the electricity price increases from carbon pricing and the larger increases from other sources will pull back demand. Under a carbon price, the market, rather than the government, will be making abatement decisions, which will ensure emissions reductions are delivered at lowest cost.

Increases in electricity prices from the introduction of carbon pricing will be much smaller than the increases after 2006 resulting from distortions in price regulation of distribution networks. Moreover, the effects of increases from carbon pricing on low and middle income earners are compensated by tax cuts and other fiscal measures, while the increases from regulatory distortions are not. The discussion of carbon pricing has drawn attention to the importance of reforming electricity network price regulation as a matter of urgency. This could significantly ease households' adjustment to carbon pricing.

In the debate surrounding transformation of the electricity sector, a number of risks have been commonly cited as threats to energy security. One risk is contract market instability. While there is an active and responsive physical spot market, transactions for electricity are primarily traded on contract markets. The many participants in the National Electricity Market have opaque contractual relationships. Retailers contract for supply in the event of high demand and thereby avoid the impact of high spot prices.

There is no established mechanism within the National Electricity Market to deal with contract market instability. This is unlike regulatory arrangements in other markets, notably financial markets, in which large and negative consequences are anticipated from the failure of large firms ('too big to fail').

The enhancement of regulatory protections in this area is warranted. This should be done through an Energy Security Council with appropriate regulatory functions. In line with understanding of best practice in the aftermath of the Great Crash of 2008, it is important that being 'too big to fail' does not protect shareholders in large enterprises from the financial consequences of changes in the business environment. One possible safeguard against generator insolvency is a government-provided temporary energy security loan guarantee.

The evolution of the electricity sector under carbon pricing should not cause the community anxiety. Australia has an incomparable range of emissions-reducing options. The early stages of the transition will see expansion of gas at the expense of coal alongside the emergence of a range of renewable energy sources. The carbon price will arbitrate between the claims of different means of reducing emissions as the profitability of each is affected by many domestic and international developments. Whether or not coal has a future at home and as an export industry depends on the success of technologies for sequestration of carbon dioxide wastes. There is little reason for concern about the physical security of energy supply during the transition to a low-emissions economy, but I propose some cost-effective measures to ease anxieties in parts of the community.

12. Choosing the future

This is the fourth time that Australia has moved towards economy-wide carbon pricing. Each time, 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 the Australian standard of living.

If we are clever, we can apply mitigation policies that have relatively little effect on the rise in living standards in the years immediately ahead.

We can do so while contributing our fair share to international action that provides substantial protection for the Australian standard of living in the more distant future. The alternative is to suffer a major setback to productivity and the rise in living standards—now, from expensive mitigation policies; or later, as we face the consequences of failure of the international mitigation effort. Australians would do well to make sure that this fourth movement towards a carbon price corrects Australia's part of the great market failure.

Australians in future will have to manage the world as they find it. We may be leaving them with a difficult task. We should seek to avoid leaving them with an impossible one. We will improve their chances by encouraging an effective global mitigation effort and doing our fair share; reducing emissions in the lowest cost way through carbon pricing; replacing the great Australian complacency of the 21st century with a new era of productivity-oriented reform.

Once we put the carbon pricing incentives in place, millions of Australians will set to work finding cheaper ways of meeting their requirements and servicing markets. We don't know in advance what the successful ideas will be, but I'm pretty sure that there will be extraordinary developments in technology. That will lower the costs of our transition to a low-carbon economy. The reductions in costs will go faster and further with the support for innovation suggested in Chapter 9.

If we didn't do much we would run great risks for Australia. It would be contrary to our national interest because it would make a strong global mitigation outcome less likely. It would be against our national interest because it would lead to our political and economic isolation and eventually to action being taken against us in international trade and other areas of international cooperation.

We would be damaged in other ways, too, if we sought to do our fair share through direct action. We would rely on the ideas of a small number of politicians and their advisers and confidants. While some of these ideas might be brilliant, in sum they would not be as creative or productive as millions of Australian minds responding to the incentives provided by carbon pricing and a competitive marketplace.

That would not be the end of the costs.

The really big cost would be the entrenchment of the old political culture that has again asserted itself after the late 20th century period of reform. The big rewards in low-emissions investments would go to those who had persuaded the minister or the bureaucrat that their idea was worthy of inclusion in the direct action plan—if not under the government that introduced the direct action policies, then under the governments that followed. That would entrench the return of the influence of the old Australian political culture in other areas of economic policy.

And we would be leaving really difficult challenges to the Australians who follow us. In the best of circumstances we would be bequeathing them a climate that is far more difficult to live in than the one into which we were born. It would be even worse if we also left them a political culture that was incapable of the flexibility—through the use of effective markets—that will be essential to Australian adaptation to a world of climate change.

Annex A: Central elements of the Garnaut Climate Change Review – Update 2011

Element	Summary
Emission reduction targets	Australia should be ready to calibrate its emissions reductions proportionately to the global mitigation effort under the Cancun Agreements which aims to limit global warming to below 2 degrees above pre-industrial global average temperatures. In 2011, the conditional target to reduce Australia's carbon pollution to 25 per cent below 2000 levels by 2020 if the world agrees to an ambitious global deal consistent with stabilising levels of greenhouse gases in the atmosphere at 450 parts per million carbon dioxide-equivalent or lower still seems appropriate. The government should adjust post-2015 targets in 2014 based on advice provided by the proposed independent committee as part of its first review (to be completed in 2014). (The suggested approach to calculating Australia's fair share is on p.5 of the summary and p.64 of the book)
Emissions trading scheme	<p>To start in mid-2012, initially with a fixed price of between \$20-\$30, rising at 4 per cent in real terms per annum. Transition to a floating price in 2015, unless there are insufficient opportunities for international trade. This will be assessed in the first review (in 2014) by the proposed independent committee.</p> <p>To encourage development of a forward price curve, there should be from commencement of the scheme, some sale by auction (with immediate payment) of undated permits for use after the first three years of the fixed price period. This could amount to around 5 to 10 per cent of the current year's volume of permit sales may be appropriate.</p>
Coverage	The 2008 Review recommended that the land sector be provided with incentives to reduce emissions through offsets. This is the intent of the Australian Government's Carbon Farming Initiative. The Review also proposed that the land sector be covered in the emissions trading scheme once issues regarding emissions measurement, estimation and administration are resolved. The proposed date for inclusion of New Zealand agriculture under the NZ scheme is a good time for a review of whether circumstances have changed enough for Australia to have full coverage of the land sector in its own scheme.
Land sector - purchase of offset credits	<p>The land sector offsets may interact with the emissions trading scheme in the following way:</p> <ul style="list-style-type: none"> • liable entities could purchase Kyoto offset credits directly, to meet all or part of their liability; and • non-Kyoto offset credits could be purchased by the regulatory authority, to a certain volume or value, using some revenue from the sale of emissions permits. <p>A limit to both interactions, especially in the fixed price period is desirable for budget neutrality purposes and to ease anxieties about the undermining of the abatement effort. Up to 14 per cent of the revenue value of permits by 2020 should be allocated to Government purchase of non-Kyoto compliant abatement and liable entities' purchase of Kyoto-compliant abatement.</p> <p>A limit of 4 per cent in 2012, rising by 0.75 percentage points per cent a year to 10 percent in 2020 is suggested for permits used by liable entities to acquit their responsibilities through the use of Kyoto-compliant offsets. A limit of 2 per cent in 2012, rising by 0.25 percentage points per cent each year to 4 per cent in 2020 of the total permit revenue is suggested for purchase of non-Kyoto credits by the regulatory authority.</p> <p>Any offset mechanisms in the land sector, including the Carbon Farming Initiative, should be seen as transitional to full inclusion of the sector in a comprehensive carbon pricing scheme.</p>

Element	Summary
<i>Scheme governance</i>	<p>The emissions trading scheme should be administered by an independent authority (i.e. Carbon Bank), taking important decisions on advice from independent expert bodies.</p> <p>An independent agency such as the Productivity Commission should be responsible for developing the principled approach to assistance for emissions-intensive trade-exposed industries, and providing advice to the independent regulator. The proposed independent committee would advise on future targets, progress towards meeting targets, the switch to a floating price and expanding coverage of the scheme. The first review by this committee would be due in 2014, that is two years after commencement of the scheme.</p> <p>Refer to Annex C for further detail.</p>
<i>Household assistance</i>	<p>Income tax and social security reform should be the central pillar of household assistance. This would be a highly efficient approach for returning revenue to many of those most affected, while sustaining the price signal from a carbon price.</p> <p>The Review Update also recommends targeted energy-efficiency assistance for low-income households that would receive little support from efficiency-raising tax reforms.</p> <p>Refer to Annex B for further detail.</p>
<i>Emissions-intensive, trade-exposed industry assistance</i>	<p>Assistance for emissions-intensive trade-exposed industries to be determined for three years based on a modified version of the former Carbon Pollution Reduction Scheme, followed by a shift, in 2015, to a principled approach based on expert advice to the Government from an independent agency.</p> <p>Refer to Annexes B and C for further detail.</p>
<i>Additional industry assistance</i>	<p>There is a case for structural adjustment assistance for regions in which economic activity and employment were hit heavily by carbon pricing. The Review Update recommends provision of \$1 billion over the first four years of the scheme.</p>
<i>Support for innovation</i>	<p>A package of short- to medium-term measures for innovation in low-emissions technologies, including a Low-Emissions Technology Commitment with a funding pledge that increases over time to \$2 to \$3 billion per year. This includes establishing a Low Emissions Innovation Council as the overarching governing body. In the short term, the administration of policies and programs for supporting demonstration and commercialisation should be strengthened by increasing the Australian Centre for Renewable Energy's independence and expanding the Centre's remit to include all low-emissions energy technologies.</p> <p>Refer to Annexes B and C for further detail.</p>
<i>The electricity sector and measures to ensure energy market stability</i>	<p>An Energy Security Council to implement measures to counter energy market instability, regardless of the source, and the judicious provision of loan guarantees to high-emissions generators through the transition to carbon pricing.</p> <p>The Review Update further recommends a review of the regulatory framework of electricity pricing in light of the apparent bias towards overinvestment in networks and unnecessarily high prices for consumers.</p> <p>Refer to Annex C for further detail.</p>

Annex B

A 10-year plan for carbon pricing revenue - supplementary note

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1. The fair and efficient use of carbon price revenue

An emissions trading scheme will be introduced at a time of great prosperity for Australia, a time of near full-employment, but also a time of emerging inflationary pressures with a major structural realignment of the economy underway. With Australia's exchange rate now at its highest level in over 25 years, we are witnessing the most significant re-allocation of resources within the Australian economy for over 100 years. Chinese and Indian, accompanied and followed by accelerated global industrial development will drive and re-structure the Australian economy in the years ahead. While there will be many bumps along the road, many features of global growth—including the predominance of growth being delivered by developing countries—and their implications for Australia are likely to persist for some time.

It makes no sense to resist this change through protectionist or similarly backward looking policies. On the other hand, it does make sense to ensure that all economic policy is optimal in the face of what will be a period of great opportunity but one that brings many challenges. To meet future challenges, economic policy should continue to be directed at building the resilience of the Australian economy, at lifting work force participation and productivity, and encouraging flexibility. The effects on living standards of sagging productivity in the years so far of the twenty first century have been masked at first by an inherently unsustainable housing and consumption boom that lasted until about 2005, and then by extraordinary income growth arising from the resources boom. But even with developing countries set to grow strongly, we cannot rely on this source of income growth in the years ahead. Expansion of supply capacity in many countries, and increasingly in developing countries in which investment had initially been difficult, will eventually reverse the improvement in the terms of trade and end the strong growth in investment in resources development. Ultimately, our ability to lift productivity growth will determine our future living standards.

In introducing an emissions trading scheme we should be mindful of these challenges. A major advantage of an economy-wide carbon pricing approach to reducing emissions compared with regulation is that, not only does it minimise the costs of emissions reductions, it also generates revenues which can be used both to ease the transition to carbon pricing for those most affected and to fund economic reform to promote growth and opportunity.

For example, an emissions trading scheme will enable a tax mix switch, an opportunity to cut inefficient and distorting labour taxes and replace them with a more efficient revenue source – the revenue from an economy wide carbon price.¹ In Update paper six, *Carbon pricing and reducing Australia's emissions*, I outlined a package of measures for the fair and efficient use of revenues from carbon pricing arrangements. In doing so I adopted the principle of fiscal neutrality accepted by the Multi-Party Climate Change Committee, which in this context means the full recycling of carbon price revenues. In this note, I outline how this package of measures might evolve over the first decade of emissions trading.

¹ Analysis by Steve Hatfield-Dodds has found that using carbon price revenues to fund targeted tax reform could halve the GDP impact of achieving the CPRS-5 and -15 emissions reductions in the period to 2020, reducing the projected GDP impact from 1.1-1.5% down to 0.5-0.8% in 2020 (Hatfield-Dodds 2011). Existing taxes (including income tax, savings tax and indirect taxes) reduce incentives for some people to participate in the workforce. Low-income earners are typically more sensitive to tax rates than high-income earners and research suggests that partnered mothers and single parents are particularly sensitive to the impact of their effective tax rate in deciding whether to undertake paid work. A carbon price—and even more for regulatory measures that reduce emissions by a comparable amount—without a reduction in other taxes, would result in less growth in real wages, thereby reducing work incentives further. Using the revenue from a carbon price to reduce existing distortionary taxes would offset and possibly reverse this compounding effect.

The carbon pricing arrangements I recommended were a fixed price emissions trading scheme for 3 years, starting in the range of \$20 to \$30 per tonne carbon dioxide equivalent, rising at 4 per cent in real terms and then moving to a flexible price scheme that was internationally linked—one that allowed the import of abatement.

From the commencement of the scheme there should be some sale by auction of permits for use after the first three years (the years of the certain fixed price). Permits should be offered assuming a move to a floating price in 2015-16. In 2012-13, 10 per cent of the estimated number of permits to be issued in 2015-16 should be sold for use in or after 2015-16; in 2013-14 the same number of permits should be sold for use in or after 2016-17; and in 2014-15 the same number of permits should be sold for use in or after 2017-18. Immediate payment would be required. To provide certainty for investors, the legislation should specify that should the carbon price be repealed, buyers of the forward auctioned permits will receive full compensation for the cost of their permits. In the case that the fixed price period is extended, permit holders would be able to utilise them at the fixed price.

Treasury's 2009 CPRS-5 modelling (modelling a 5 per cent reduction in emissions on 2000 levels by 2020) provides an indication of the revenue likely to be associated with my recommendations. Using the assumptions underpinning Treasury's modelling suggests that revenues from the scheme would start around \$12 billion in 2012-13 rising to around \$16 billion by 2022-23. Of course, this profile of revenue is predicted on a particular emission target. Tighter targets would see fewer permits issued and hence less revenue, keeping in mind that in an internationally linked scheme the price of permits will equal the global price of permits and be unaffected by Australia's ambition.

Revenue from an emissions trading scheme can be directed to three groups of recipients: Australian households; businesses; and other countries. The debate over carbon pricing and the allocation of revenues often focuses on the initial incidence of the carbon price burden and the initial allocation of revenues among these groups. While important, the extent to which the allocation of revenues among groups and purposes changes over time is perhaps a more important consideration and the focus of this note.

Australian households will ultimately bear the full cost of a carbon price. Returns to capital are determined in international markets and any reduction in them by domestic policy measures is temporary, except to the extent that the policy measures fall on rents from natural resources, monopoly or technology. It makes sense from equity and efficiency perspectives for households to ultimately receive the vast majority of the carbon pricing revenue. From both perspectives there is a great opportunity to improve workforce incentives among low income groups by delivering assistance to them through cuts in labour income taxes.

Moreover, and despite the unfortunate myth to the contrary, providing tax cuts for low and middle income households will not blunt the incentive to lower emissions and achieve our targets. Instead, it will assist household to re-orientate their expenditures toward goods and services that embody low emissions and at the same time the carbon price will set in train a supply side adjustment that enables emissions reductions to be achieved at lowest cost.

While over the longer term Australian households should receive most of the carbon price revenue, there is a short to medium term case for providing assistance to businesses and a particular case for focusing on innovation.

In Update papers six, seven (*Low emissions technology and the innovation challenge*) and eight (*Transforming the electricity sector*), I made the case for transitional assistance for business in four respects. First, to deal with the economic and environmental inefficiencies that might accompany the effects of a carbon price on emissions-intensive, trade-exposed industries who are unable to pass on the carbon price in the same way as businesses competing in domestic markets; second, to lower the cost of transition to a low-emissions economy by addressing market failures in innovation; third, through structural adjustment assistance for regions most affected by a carbon price; and fourth, to support energy security through the transition to a low emissions electricity sector. Farm and rural businesses would receive a large boost from the linking of the carbon farming initiative to the carbon pricing scheme.

The structural adjustment being forced through the economy by the resources boom is an important additional consideration in designing business assistance. It strengthens the case for 'generous' assistance for parts of the manufacturing sector while also strengthening the case for a 'highly disciplined' approach to resources industries such as liquefied natural gas (LNG) and coal whose rapid expansion is placing pressure on manufacturing, tourism, education, agriculture and all other industries producing goods and services in competition with international suppliers. The proposed assistance arrangements for the first three years may involve a degree of over-compensation or subsidy. This means that any industry reviewed for principled assistance later, rather than earlier, will be advantaged. Therefore, the first priority for review should be given to the industries which are the largest beneficiaries of the contemporary resources boom.

There is a strong case for the Carbon Farming Initiative to be linked to an emissions trading scheme. This case is built upon the significant potential for abatement in the land sectors which initially would not be covered by the scheme and the support it would offer to regional economies. This will have the effect of reducing revenues, though more in the first three years before international linking than in later years. Update paper four, *Transforming rural land use*, suggested that limits be placed on the total amount of offsets, rising to 14 per cent of the scarcity value of permits by 2020. These limits would be removed with full coverage of agriculture under the emissions trading scheme.

Complementary revenue-neutral reforms could accompany an emissions trading scheme, which were designed to be consistent with the principles that underlie the use of the carbon price revenue. An example is the announced reforms to Fringe Benefits Tax arrangements. Revenue from these sources then could be used towards funding a one-off reduction in petrol excise. Further, I recommend in Update paper two, *Progress towards effective global action on climate change*, directing toward global climate change objectives some of the significant step up in foreign aid in coming years associated with Australia's commitment to increase spending on aid to 0.5 per cent of GDP by 2015-16.

2. Revenue from an emissions trading scheme

A carbon price of \$26 per tonne of carbon dioxide equivalent would generate around \$11.5 billion in potential revenue from the value of permits in 2012–13.

Once the shift to the flexible price emissions trading scheme takes place, tighter emissions reduction targets lead to less revenue. It may be that the shift to a floating price occurs when the exchange rate is much lower than today and the price of carbon correspondingly higher, so that any reduction of revenue from a tighter target would be from a higher base. Some expect tighter domestic targets to lead to a higher carbon price. However in a flexible price, international linked emissions trading scheme this is not the case except to the extent that a stronger Australian

target is adopted in the context of a more ambitious global target. The Treasury modelling captures this feature by assuming that Australia is a price taker—so regardless of the level of Australia’s (net) emissions ambition, the global price is unchanged.

For example, a minus 15 per cent target in 2020 would reduce revenue by around \$3.0 billion in 2020 compared to a minus 5 per cent target and by around \$14 billion over the decade.

Any package of reform needs to be mindful of these potential limitations on future revenues from a carbon price should targets change, as would be necessary to fulfil Australia’s international commitments and for Australia to contribute its fair share of the more ambitious global effort that is in Australia’s national interest.

Table 1 brings together the recommended uses of the carbon revenue over the next decade in a budget-neutral framework.

Table 1: Reducing emissions and economic reform – an illustration of a package (expenditure as a proportion of revenue)^a

	Fixed	Floating	2021-22	Total
Total Permit Revenue^b	100%	100%	100%	100%
Household assistance	55%	60%	60-65%	60%
<i>Tax reform</i>	40%	45%	50%	45%
<i>Benefits payments^c</i>	15%	15%	10-15%	15%
<i>Energy efficiency</i>	1%	0%	0%	<1%
Business assistance	35%	25%	20%	25-30%
<i>Industry assistance^d</i>	30%	25%	20%	26%
<i>Electricity transition</i>	3%	0%	0%	<1%
<i>Structural adjustment</i>	2%	0%	0%	<1%
Innovation^e	10%	15-20%	20%	15%
Carbon Farming^f	5-10%	10-15%	15%	10%
Gross Expenditure	105%	110-15%	115%	110%
<i>Less market offsets and Existing innovation expenditure</i>	5 -10%	10-15%	15%	10%
Net Budget Impact	0%	0%	0%	0%

Note: This is Table 6.1 in *The Garnaut Review 2011: Australia in the Global Response to Climate Change*, p.87.

^a Fuel reform and aid monies are not drawn from permit revenue and are therefore not shown.

^b Includes the increase in revenues for the first three years from auctioning of permits for use at later dates. The sum of percentages may not add to 100% due to rounding.

^c Half the welfare payments under the CPRS package.

^d Proportion of assistance paid to EITEs assumed to fall by 1.5 percentage points each year after year 3.

^e This percentage includes existing innovation funding as outlined in section 3.2.

^f This percentage includes Kyoto Protocol offsets sold to liable entities (which do not represent a cost to the Government) as outlined in section 3.3.

3. Uses of revenue from an emissions trading scheme

3.1 Household assistance and tax reform

Tax cut for low and middle income households

Revenue from an emissions trading scheme presents an opportunity to improve the efficiency of the tax system while compensating those most affected by the introduction of a carbon price. In Update paper six, *Carbon pricing and reducing Australia's emissions*, I recommended that initially around half the emissions trading scheme revenue could be used to fund tax reform for low to middle income households as a mechanism for compensating them for price increases associated with the carbon price.

Over time, as the transitional assistance to business declines, there will be a further opportunity to provide more assistance to these households through a second round of tax cuts. Our analysis suggests that 3 to 5 years into the scheme, more revenue would become available to fund further tax cuts and innovation spending. By year 10, 60-65 per cent of the permit revenue could be taken up with assistance to households. In addition to this, the recommended one-off cut to the fuel excise (discussed below) will provide households with significant assistance for cost of living pressures flowing from increased petrol prices.

This tax cut could take many forms but should have the following characteristics. It should be targeted at low and middle income households. It should improve incentives to participate in the workforce. And it should generate a net improvement in the overall efficiency of the tax system.

In line with these principles, an amended version of the income tax reform proposed by the Australia's Future Tax System review (Australian Government 2009) could be implemented. In particular, the raising of the tax free threshold to \$25,000, the removal of the low income tax offset and potentially the seniors' tax offset but not at this stage proceeding with the other changes to thresholds and rates. According to the Australia's Future Tax System review, raising the tax free threshold to this level would see more than 1.2 million people paying no tax.

Moreover, because raising the tax free threshold would have the effect of cutting tax for all taxpayers including high income taxpayers, it significantly increases the cost of the tax cut compared with making cash payments or increasing the benefits to low income households. I therefore propose simultaneously adjusting thresholds and or rates to effectively net off the value of the cut in tax for higher income earners (say, for example, those earning more than \$80,000). These changes should be designed to leave higher income earners no worse off as a result of tax changes. There may be a small negative impact on the work incentives for higher income earners by these changes depending on the extent to which effective marginal tax rates are changed, though these effects should be small compared with the improved incentives for lower income earners.

Benefit payments

The Government's Carbon Pollution Reduction Scheme package provided substantial assistance to beneficiaries including pensioners, seniors, carers, and people with a disability. Assistance was also provided to self-funded retirees through increases in the seniors' concession allowance, recipients of allowance benefits, and family tax benefits A and B.

The 2009 Treasury modelling of the Carbon Pollution Reduction Scheme estimated that the effect of a \$25 carbon price on the consumer price index (CPI) was 1.1 per cent. Those beneficiaries whose benefits are linked to the CPI would have seen their benefits increase once the carbon price effect had flowed through to the CPI. In recognition of the lag between prices rising and indexation leading to higher benefits, the Government brought forward the increase in benefits.

Also, in recognition of the price impacts on some groups such as age pensioners being more than the (average) CPI effect, in this case 1.3 per cent rather than 1.1 per cent, an additional permanent increase in benefits was paid in the order of 1.4 per cent. Together this took the initial increase in benefits to 2.5 per cent.

While I accept that the same beneficiaries should be compensated through indexation that is brought forward and through an additional permanent increase to account for the relatively high proportion of expenditure that these groups use on emission intensive goods, I suggest that this be commensurate with the additional cost rather than the total 2.5 per cent offered under the original Carbon Pollution Reduction Scheme arrangements. It is relevant that since the CPRS, pensioners, especially single pensioners have received substantial increases in their benefits in recognition of ongoing cost of living increases.

These changes would have the effect of roughly halving the amount of assistance given to beneficiaries. Beneficiaries received a little over half of the assistance provided to households under the Government's CPRS suggesting a saving of around \$1 to \$1.5 billion per year. The savings from this smaller increase to beneficiaries could be directed toward the tax cut for low income households.

Energy efficiency

There is a case as I outlined in Update paper six, *Carbon pricing and reducing Australia's emissions*, to provide additional assistance to low income households that are exceptionally dependent on expenditure on electricity and gas. I suggest that \$400 million over four years be set aside to enhance existing state energy efficiency programs that have proven to be effective. It should also be recognised that a small proportion of low income households which are receiving pensions and benefits have disabilities or health issues that generate exceptional energy requirements. It is important that the public and private systems which assist households in these circumstances are asked to identify them, and that they receive specifically targeted lump sum payments to compensate for higher costs of energy—which may be reduced following assistance through the targeted energy efficiency measures that would be delivered on an ongoing basis through existing state programs. Over time there should be funding reform in this area to encourage a nationally consistent approach.

3.2 Transitional assistance for business

Assistance for emissions-intensive, trade-exposed industries

In Update paper six, *Carbon pricing and reducing Australia's emissions*, I outlined an approach and a set of principles for assisting emissions-intensive trade-exposed industries in the early years of a price on carbon. This involved accepting a modified version (removing the global financial crisis buffer) of the Government's Carbon Pollution Reduction Scheme approach to assistance for the first three years, while arrangements are put in place to implement an approach that builds on the principles I articulated in the 2008 Review. See Update paper six for a detailed discussion of my approach.

I expect that three years from the start of the scheme—four years from now—is ample time for a well resourced professional organisation to come to grips with the analytic and data requirements of a principled approach to setting levels of assistance for trade-exposed industries. Benchmarking of some industries would commence as soon as possible, to provide guidance on emerging shapes of future assistance and to provide a basis for assessment of techniques and data. Industries receiving the largest shares of the assistance, such as aluminium, alumina, petroleum and LNG, would be the first industries to be covered by benchmarking. To cover all possibilities, if it were not possible for a well-resourced, independent professional body to complete reviews of assistance to all industries on the basis of economic efficiency principles in four years from now, the priorities for review would be determined by the scale of initial assistance to the industry. The default position for industries awaiting review would be continuation of the arrangements that had been put in place at the beginning.

There are different opinions about the implications for levels of assistance in particular industries of the disciplined application of economic efficiency principles. My own assessment is that the CPRS arrangements, even without the global financial crisis buffer, over-compensated many industries when the effects of what other countries were actually doing to reduce emissions were brought to account in an objective and informed way within a principled approach to assistance. Many business leaders have a different view about the empirical implications of application of the same economic principles. While the outcome would have substantial implications for the net revenues available for other purposes, it is important to allow the facts to determine the outcome. The assistance scheme would be administered by an independent regulatory authority with the powers to make payments out of the carbon revenues. My assessment of future assistance for trade-exposed and emissions intensive industries embodied in Table 1 are conservative; some business leaders at present would have different assessments. Outcomes would depend amongst other things on actual costs of emissions-reducing measures by other countries from time to time.

Nevertheless, my assessment is that these changes should see, after year's three to five, the proportion of carbon price revenue allocated to emissions-intensive trade-exposed industry stabilising and beginning to decline. This outcome differs from that under the 2009 CPRS-5 package where the proportion of permit revenue to emissions-intensive trade-exposed industry steadily increased over time.

A declining proportion of revenue to emissions-intensive trade-exposed industry will in later years open up the opportunity to fund further household tax reform and innovation spending.

Innovation

Update paper seven, *Low emissions technology and the innovation challenge*, provides a detailed discussion of my recommendations for innovation measures to lower the cost of the transformation to a low emissions economy.

I proposed a package of measures including increasing support for public and private basic research; market-led support for private demonstration and commercialisation; the Low-Emissions Technology Commitment on total funding, and strong and independent governance arrangements.

This would lead to expenditure on research, development and commercialisation of low emissions technologies rising to \$2-3 billion per annum. There are already a number of Government budget expenditures in these areas. For the period when these are being implemented, these revenues should be counted towards the Low Emissions Technology Commitment, without funding being drawn from the carbon revenue. My recommendations on innovation are based on the expectation that current levels of expenditure on low-emissions technology innovation during the forward estimates period—around three quarters of a billion dollars per annum—would be continued beyond the forward estimates throughout the ten year carbon revenue budget period, without drawing on carbon revenues. Existing arrangements include the Australian Government's \$5.1 billion Clean Energy Initiative and other programs (see Update paper seven for more information). The capacity to make good use of innovation expenditure would rise over time so budgetary provision is phased up towards \$2.5 billion per annum. Over the first five years of the carbon pricing arrangements, funding committed under these programmes would meet a substantial part of the fiscal support for innovation, although it may be re-deployed in the light of experience. In later years the majority of the innovation support would be funded from carbon price revenue.

Structural assistance

There is also a case for structural adjustment assistance for the workers and communities of for example coal-based emission intensive power generation regions. For a case to be made for public support on those grounds, it must be shown also that such measures can cost-effectively improve the efficiency of the adjustment process.

I recommend making a provision of \$1 billion over the first four years of the scheme for this assistance.

Transforming the electricity sector

There have been some concerns that the carbon price will affect energy security through its impact on emissions intensive generators, including through the instability that this might prompt in electricity contract markets.

The introduction of a carbon price is highly unlikely to threaten physical energy security. Nevertheless, it may be prudent to implement cost effective policy measures to assuage concerns about energy security and to improve the regulatory functions of the energy market. These measures include: the introduction of an Energy Security Council to implement measures to counter energy market instability regardless of the source; and the judicious provision of loan guarantees to high-emissions generators through the transition to carbon pricing.

In Update paper eight, *Transforming the electricity sector*, I discuss the parameters of such a guarantee including the main constraint that there should be a limit on the maximum proportion of loans covered by the guarantee. For the purposes of this exercise, I suggest a provision of around \$1 billion for circumstances in which the loan guarantee is called by a financially distressed generator. This is likely to be a more than adequate provision.

3.3 Carbon Farming

In Update papers four, *Transforming rural land use*, and six, *Carbon pricing and reducing Australia's emissions*, I noted the strong case for allowing businesses covered by the emissions trading scheme to meet part of their liabilities by purchasing Kyoto-compliant Carbon Farming Initiative offsets.

There is also a case for the purchase of non-Kyoto land sector offset credits by the regulatory authority, using some carbon price revenue. The case is strongest in the early years, ahead of a floating price and coverage of the land sector, and ahead of broader international recognition of land sector abatement activities.

As discussed earlier in Update paper six, a limit of 4 per cent in 2012, rising by 0.75 percentage points a year to 10 per cent in 2020 is suggested for permits used by liable entities to acquit their responsibilities.

A limit of 2 per cent in 2012, rising by 0.25 percentage points each year to 4 per cent in 2020 of the total permit revenue is suggested for purchase of non-Kyoto credits by the regulatory authority.

Further, once the emissions trading scheme moves to the flexible price and is internationally linked, the limits on Kyoto carbon farming credits will no longer affect permit revenue. However, payments for non-Kyoto abatement will continue to be paid out of the permit revenue.

3.4 Complementary reforms

Fringe Benefits Tax reform and fuel excise

In Update paper six, *Carbon pricing and reducing Australia's emissions*, I note the considerable concerns about the distributional effects of increases in petrol prices associated with carbon pricing, particularly for those living in outer-suburban and regional areas.

I have suggested an expedient that has efficiency, equity and environmental advantages over the simple passing on to petrol users of the initial carbon price impact. The expedient was that the increase in petrol prices following the introduction of a carbon price would be offset through a one-off reduction in petrol excise. I suggest that the cut in fuel excise—that component that affects households—be permanent but that the increase in fuel offset credits be only for the first year of the emissions trading scheme.

The cost of this could be covered by reform of other fiscal arrangements that promote the use of fossil fuels, and which would have as large or larger beneficial effects on emissions than the excise on fuel. I suggested focussing on the fringe benefits tax arrangements related to private vehicle use. The fringe benefits arrangements were identified as being highly distortionary by the Australia's Future Tax System review (Australian Government 2009). Removing the incentive for overuse of motor vehicles in the Fringe Benefits Tax arrangements will have a small, favourable effect on reducing emissions. I note that the Government introduced a reform of fringe benefits

tax on cars in the 2011 budget. In Update paper six I had proposed that revenue from reform of the fringe benefits tax be credited towards the once-for-all adjustment in excise.

The fringe benefits tax reform generates significant revenue, but not enough to pay for the one-off reduction in petrol and diesel excise. I recommend paying for the cut in excise in full with cuts in fossil fuel-related tax concessions. An option includes cutting FBT on cars and parking altogether which would generate most of the revenue to pay for the fuel excise cut. The FBT reform could be accompanied by other measures to cut distortionary subsidies that encourage fossil fuel consumption. I would not recommend the cut in excise in the absence of other emissions-reducing fiscal changes.

Foreign aid and international climate financing obligations

In Update paper two, *Progress towards effective global action on climate change*, I discussed the 2008 Review's recognition of the limited extent of global public funding for mitigation, technology support and adaptation in developing countries and this being a weakness in the world's response to climate change.

In June 2010, Australia announced it would commit \$599 million to support fast-start efforts in developing countries, through the aid budget. While countries' pledges are based on various measures, Australia's fast-start contribution constitutes around 1.8 per cent of the global commitment. This amount is roughly consistent with Australia's contribution to the International Development Assistance arm of the World Bank and the Global Environment Facility.

Assuming Australia were to provide 1.8 per cent of the global effort agreed at Copenhagen to mobilise USD \$100 billion per year in 2020 (to support developing country action on mitigation, adaptation, technology development and transfer and capacity building) which is above its current contribution share to global fast-start climate finance, this would amount to \$1.8 billion per year by 2020, or around \$0.7 billion per year at 2015 assuming a steady increase to the maximum level.

Many countries will fulfil part of their financing commitments from aid budgets. This makes sense in the light of the synergies between climate change adaptation and broader development objectives. In this context, it would be reasonable for the Australian Government to allocate a portion of its increasing Overseas Development Aid to meet its commitment for international climate change contributions.

This could be done without serious concerns about diversion away from other purposes. If three quarters of a \$0.7 billion financing commitment at 2015 were to be met through public sources, this would amount to a \$0.51 billion draw on the foreign aid budget, representing around one-eighth of the increase in aid spending by 2015, and only around one-sixteenth of the total aid budget. This does suppose that other financing sources, both public and private, are harnessed to support climate change action in developing countries. To facilitate private investment, some of the increased innovation expenditure allocated to Australian firms could be spent by them in developing countries. This could become important within a regional climate change agreement with neighbouring developing countries.

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Annex C

Governance arrangements for Australia's carbon pricing scheme - supplementary note

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1. Introduction

This note consolidates and expands upon the Update's recommendations regarding the governance of an Australian emission trading scheme and complementary policies.

It discusses the role of the Parliament, Government and the responsible Minister as well as three independent bodies: the Independent Authority or Carbon Bank; an Independent Agency to advise on assistance rates for emissions-intensive trade-exposed industries; and an Independent Committee to advise on future emissions reduction targets and revisions to Australia's emissions cap.

The note also discusses governance arrangements designed to address energy security concerns and those surrounding the Update's recommended Low Emissions Technology Commitment to accelerate innovation and lower the cost of the transformation to a low emissions economy.

2. Governing Australia's emissions trading scheme

There will be no success in mitigation, at a national or international level, without good governance. The policies that will mitigate climate change cut across strong interests of many kinds. These are circumstances in which it is easy, indeed natural, for vested interests to capture policy, and for the ultimate reasons for policy to be forgotten. Good governance is an antidote to these tendencies: the articulation of clear and soundly based principles as a foundation for policy, and the establishment of strong, effective and well-resourced institutions to implement the principles.

Scheme governance has implications for the efficiency, stability, and credibility of the emissions trading scheme. New institutions will be required to advise Government on, and to operate and regulate, the emissions trading scheme. As I outlined in 2008, some of the governance functions related to the scheme, are by their nature, the prerogative of Government. These include decisions about establishing the scheme, setting the medium and long-term emissions reduction targets, deciding which sectors should be covered by the scheme; the broad principles for providing transitional assistance to emissions intensive, trade exposed industries, and the principles governing the point at which the scheme should switch from a fixed to a floating price.

As was the case under the governance arrangements proposed for the Government's Carbon Pollution Reduction Scheme, the more substantial governance functions related to the scheme would be subject to parliamentary scrutiny through legislation. Legislating for all the main features of the scheme through an authorising Act of Parliament strengthens the long-term stability of the scheme. The ongoing administration of the scheme would also be provided by an authorising Act of Parliament. Moreover, some of the decisions to be taken as the scheme matures will require substantial input and direction from independent bodies. The relationship between these bodies would be specified in an authorising Act of Parliament which would also identify the appropriate use of delegated legislation.

I have recommended that three independent bodies be established to implement and administer Australia's carbon price arrangements. One entity would advise on future targets and scheme caps. One would advise on the transition and administration of a more disciplined approach to assistance to emission intensive trade exposed industries. Finally, the scheme regulator or carbon bank would administer the emissions trading scheme.

2.1 An independent committee to advise on future targets and other matters

I recommend the establishment of an Independent Committee, similar to the United Kingdom Committee on Climate Change, to provide advice to the Government on: national targets and scheme caps; progress towards meeting targets; the switch to a floating price; and expanding coverage of the scheme. This would be done through regular reviews of the emission trading scheme, with the first review to occur no more than two years after commencement of the scheme so that its advice is available to the Government to consider prior to the switch to a floating price for emissions and with subsequent reviews no longer than five years after the preceding review. As is the case in the UK, the Committee would provide recommendations to Government. The Government would have 60 days to decide to accept or reject the recommendations from the review and amend legislation or regulations as required. The regulator or “carbon bank” would then give effect to the Government’s decision on the cap by issuing permits. The functions of the Independent Committee would expand upon those of the Expert Advisory Committee proposed under the former Carbon Pollution Reduction Scheme (see Appendix 1).

Should the Government wish to take an approach that differs from the Independent Committee’s recommendations, it would be required by legislation to present to Parliament the reasons for its alternative decision. This approach is similar to the arrangements for setting carbon budgets, or national emissions reduction targets, in the UK.

The Independent Committee should also be subject to accountability arrangements whereby the chair of the Committee periodically appears before a parliamentary committee such as the Standing Committee on Climate Change, Environment and the Arts and publishes each year an assessment of the Australian emissions trading scheme and progress toward targets. The committee could also advise on the progress on international action on climate change.

2.2 An independent agency to advise on assistance to emissions intensive, trade exposed industry assistance

The broad principles for providing transitional assistance to emissions intensive, trade exposed industries would be covered by the Act of Parliament required to establish the emissions trading scheme. The principle objective is to provide assistance to Australian industries which has the effect of ensuring economic efficiency and maximising Australian economic welfare in the light of costs imposed by other countries on trade-exposed and emissions-intensive industries in the course of those countries reducing greenhouse gas emissions. I recommend the establishment of an independent agency to provide advice on this assistance. The agency would have features similar to the Productivity Commission and could be the Productivity Commission. The agency would be transparent in its work, independent of government direction and have strong professional capacities. The agency would develop a principled approach to emissions-intensive, trade-exposed industry assistance beyond the interim period. The agency would be recognised as performing a major task of national economic administration and would be provided with the resources to do its job well. As set out in Update paper six—*Carbon pricing and reducing Australia’s emissions*, in developing further detail of this approach, the Independent Agency should be supported by a technical advisory committee staffed by relevant experts, with strong links to industry.

As per the recommended arrangements for the Independent Committee, the Government would have 60 days to act on the recommendations regarding the principled approach to emissions-intensive, trade-exposed industry assistance by the Independent Agency. Similarly, should the

Government wish to take an approach that differs from that recommended by the Independent Agency, it would be required by legislation to present to Parliament the reasons for its alternative decision.

2.3 An independent authority to administer the emissions trading scheme – The Carbon Bank

As in the 2008 Review, the Update suggests that the administration of the emissions trading scheme be made the responsibility of an Independent Authority or Carbon Bank. The Carbon Bank should be established such that it has a high degree of independence in the exercise of its responsibilities. Accountable to the responsible Minister and Parliament, the overarching objective of the Carbon Bank would be the implementation of the scheme as established in legislation. The Carbon Bank would also administer the assistance to emission intensive trade exposed industries.

Figure 1 and Table 1 set out the broad governance arrangements for these three independent bodies. For comparison, Appendix 1 provides a summary of the governance arrangements proposed for the Government’s Carbon Pollution Reduction Scheme.

Figure 1: Governance arrangements for Australia’s emission trading scheme

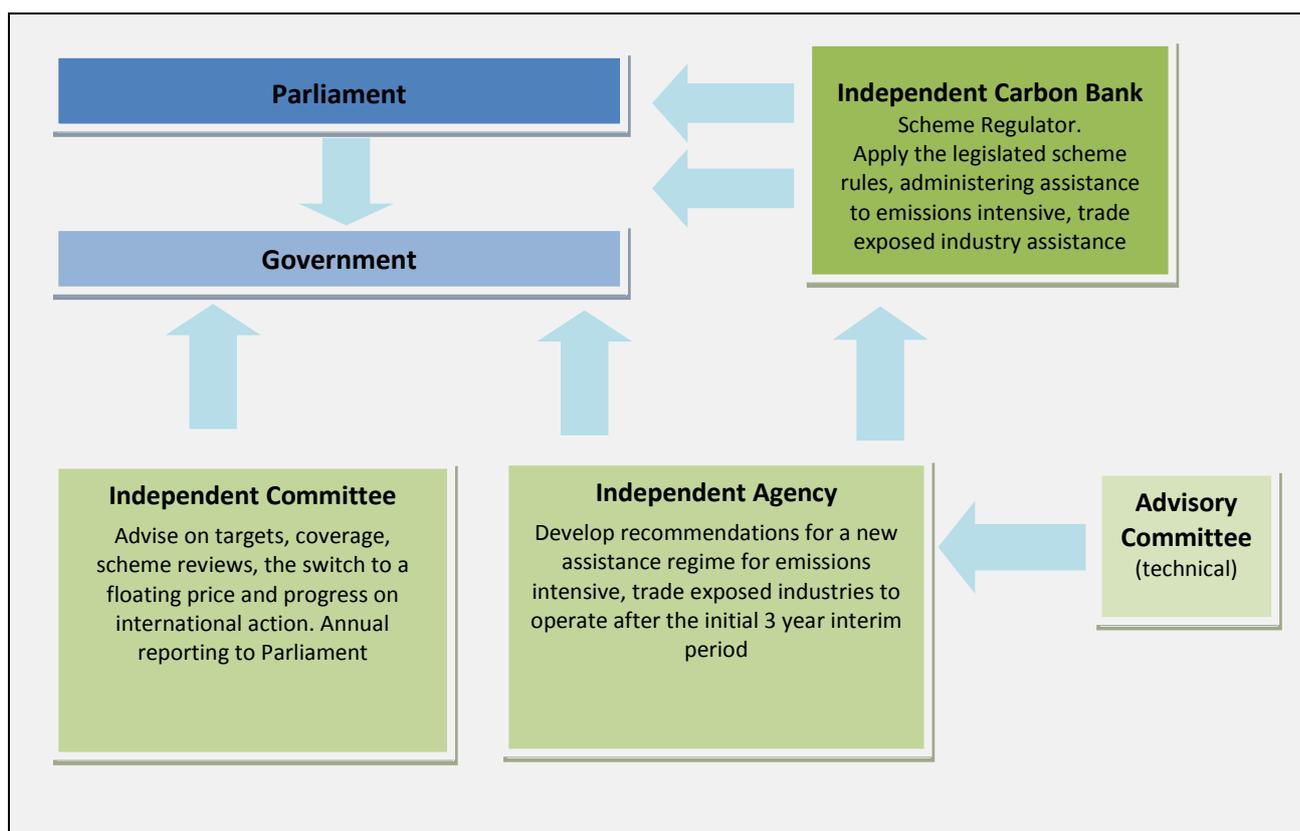


Table 1: Recommended governance arrangements for Australia's emissions trading scheme

Functions of scheme governance	Government	Independent entities
Emissions trading scheme rules	<p>All rules established in legislation and regulations, including coverage, point of obligation, acquittal, offset rules and standards (domestic and foreign), accounting rules, and the compliance regime.</p> <p>Initiate reviews by the Independent Committee of scheme rules, performance and governance. First review to occur three years after commencement with subsequent reviews every five years.</p>	<p><i>Independent Committee:</i></p> <ul style="list-style-type: none"> Provide advice on coverage of land sectors (in 2015); and reviews of scheme rules, performance and governance (first review in 2014 i.e. prior to shift from floating to fixed permit price and from interim to principled approach to assistance for emissions intensive trade exposed industry). <p><i>Independent Carbon Bank:</i></p> <ul style="list-style-type: none"> Apply the legislated scheme rules. Manage monitoring, reporting and verification systems Enforce compliance Determine liable entities' obligations to surrender permits Manage Australia's National Registry of Emissions Units Provide education on the scheme
Setting emissions limit	<p>Decide, based on advice from the Independent Committee:</p> <ul style="list-style-type: none"> Emission reduction targets and scheme caps; conditions for changing targets and scheme caps; and the nature, extent and timing (with five years' notice) of changes to the targets and scheme caps. 	<p><i>Independent Committee:</i></p> <ul style="list-style-type: none"> Provide advice on future targets and scheme caps. <p><i>Independent Carbon Bank:</i></p> <ul style="list-style-type: none"> Administer new caps legislated by Government.
Assessment of switch from fixed to floating permit price	<p>Decide if conditions for switch from fixed to floating permit price have been met.</p>	<p><i>Independent Committee:</i></p> <ul style="list-style-type: none"> Advise on whether opportunities for international trade in entitlements are sufficient to support a liquid and stable permit market; if not sufficiently mature in 2015, review the situation every year until sufficient opportunities for international trade have emerged.
Emissions intensive, trade exposed industry assistance	<p>Respond to recommendations regarding a more disciplined approach to the emissions-intensive, trade-exposed industry assistance program.</p>	<p><i>Independent Agency</i> (supported by technical advisory committee):</p> <ul style="list-style-type: none"> Develop and recommend approach to emissions-intensive, trade-exposed industry assistance beyond 3 year interim period Undertake regular benchmarking and other assessments to determine appropriate rates of assistance The shift from interim approach to principled approach to emissions-intensive, trade-exposed industry assistance to occur in mid-2015. If data requirements are not met in 2015 for some industries, the Independent Agency should provide advice on any modifications to the interim approach for those industries and undertake a review of data requirements on a yearly basis until they are met. <p><i>Independent Carbon Bank:</i></p> <ul style="list-style-type: none"> Administer the assistance to emission intensive trade exposed industry.
Trade rules (international linking)	<p>Establish international trade agreements and rules for international linking.</p> <p>Advise on any expansion or contraction of the list of eligible international units.</p> <p>Purchase international permits to reconcile domestic and international obligations (for example, to meet a 2020 target).</p>	<p><i>Independent Committee</i></p> <ul style="list-style-type: none"> Advise on opportunities to link Australia's emission trading scheme to existing and emerging international markets <p><i>Independent Carbon Bank:</i></p> <ul style="list-style-type: none"> Monitor international trade by market participants.
Scheme Stability	<p>Objectives established in legislation</p>	<p><i>Independent Carbon Bank</i></p> <ul style="list-style-type: none"> Monitor carbon markets domestically and internationally and act to ensure flexible price trading remains on a sound footing

3. Decision making and operating an emission trading scheme

This section discusses the role of the proposed independent bodies in the design, settings and operations of Australia's emissions trading scheme.

3.1 Setting targets and scheme caps

A target for the reduction of emissions will need to be established in advance of the movement to a floating permit price. Australia's current unconditional target for 2020² would be reflected in the authorising Act on establishment of the emissions trading scheme. A more ambitious target³ could be legislated in the future when judged to be appropriate or negotiated in establishing a regional market. The first opportunity to revise the target would be provided by the Independent committee's first review report no more than 2 years after the establishment of the scheme. The minus 5 per cent unconditional target would remain as the minimum emissions reduction target.

In general, new targets or scheme caps should be recommended to Government through independent reviews with processes and governance similar to that employed by the UK's Committee on Climate Change (see Box 1). Reviews of Australia's emission reduction targets should be conducted to ensure that Australia plays its proportionate part in global efforts, within principles set out in the legislation. In particular, the Independent Committee should provide recommendations to the Government on Australia's future emissions reduction targets and scheme caps, with the resultant decisions to be embodied in legislation and regulations to guide the activities of the Carbon Bank in the issuance of emission permits.

Australia's targets should be reviewed by the Independent Committee no later than two years after the scheme's commencement, with subsequent reviews as required by developments in circumstances but no later than five years from the previous review. Should the Government, on recommendation from the Independent Committee, wish to change Australia's emissions reduction targets and therefore scheme caps, it would provide the market with five years' notice. This would provide the market with five years of firm scheme caps at all times.

Once there is a floating permit price and international trade in entitlements, business leaders will look to domestic and international futures markets rather than to domestic targets for guidance on future prices.

3.2 The switch to a floating price and international linking

In Update paper six, *Carbon pricing and reducing Australia's emissions*, I proposed that Australia's emissions trading scheme shift from a fixed to a floating price in 2015, unless it is judged by the Independent Committee, and agreed by the Government, that there are insufficient opportunities for international trade in entitlements to support a liquid and stable market for emissions permits. The Independent Committee's consideration of whether the scheme should

² Australia has had an unconditional target to reduce emissions by at least 5 per cent by 2020 (relative to 2000 levels) since 2008. This target has bipartisan support. It became a commitment to the international community in Copenhagen in December 2009, and became part of a set of international agreements made in Cancun in December 2010.

³ Under the 2009 Copenhagen Accord and reflected in the 2010 Cancun agreements, Australia's international commitments also include a 25 per cent reduction of greenhouse gas emissions by 2020 relative to 2000 if there is an ambitious global deal consistent with stabilising levels of greenhouse gases in the atmosphere at 450 parts per million CO₂-equivalent or lower. The 2008 Review assessed and the Australian Government (with support of the Opposition) accepted that it was in Australia's national interest for the international community to agree on an objective of holding emissions concentrations to 450 parts per million, which roughly corresponds to the 2 degree temperature increase on pre-industrial levels that was agreed at Cancun. The 2008 Review assessed that Australia's proportionate contribution to an effective global agreement on 450ppm would be to reduce emissions from 2000 levels by 25 percent by 2020 and 90 percent by 2050. The various emissions reduction commitments at Cancun do not yet add up to what is required to achieve the 450 ppm objective.

shift from a fixed to a floating price should be made in conjunction with the Committee's advice on emissions reduction targets for Australia post-2015. Should the emissions trading scheme continue to operate with a fixed price after 2015 due to insufficient international trade opportunities, the Committee should review every year whether sufficient opportunities for international trade have emerged.

The Independent Committee will be well placed to advise on opportunities to link Australia's emission trading scheme to existing and emerging international markets. The Government should work towards establishing relevant international trade agreements, with high priority being given to an international climate change agreement among western Pacific countries.

Box 1: The UK Committee on Climate Change - a model for Australia

The UK's Committee on Climate Change provides a model on which Australia could base the design of its Independent Committee.

As discussed in Update paper six *Carbon pricing and reducing Australia's emissions*, the case for an open, dynamic and adaptive approach to domestic mitigation decisions is recognised in other jurisdictions. For instance, in developing recommendations for its country's short- and medium-term carbon budgets, the UK's Committee on Climate Change considers implications of the 2050 target and appropriate contributions by the UK to required global emissions reductions in 2020, European Union targets for emissions reductions to which the UK is already committed, and a bottom-up sectoral analysis of feasible emissions reductions and likely costs (UK Climate Change Committee 2008).

Considering a number of conditions, including projected prices for offsets and European Union emissions trading scheme allowances, the UK Committee forecasts a carbon price of £40 (\$A64.05) per tonne carbon dioxide equivalent in 2020 in their central case for analysis of carbon budgets.

UK Committee on Climate Change

The Committee on Climate Change was appointed as a statutory committee under the UK Climate Change Act 2008 (UK Government 2008). The primary function of the Committee is to provide independent advice to the UK Government and Devolved Administrations on setting and meeting carbon budgets, or national emissions reduction targets. Another key role of the Committee is to provide advice on setting a framework for adapting to climate change in the UK. The Committee also performs broader roles, including engaging relevant parties to share evidence and analysis, conducting independent research and analysis into climate change science, economics and policy as these relate to the UK's carbon budgets, and responding to ad hoc requests for advice from the UK Government and Devolved Administrations (UK Committee on Climate Change 2009a).

In appointing a member, the UK Climate Change Act 2008 legislates that the Government must have regard to the desirability of securing that the Committee (taken as a whole) has experience in or knowledge of the following—

- (a) business competitiveness;
- (b) climate change policy at national and international level, and in particular the social impacts of such policy;
- (c) climate science, and other branches of environmental science;

(d) differences in circumstances between England, Wales, Scotland and Northern Ireland and the capacity of national authorities to take action in relation to climate change;

(e) economic analysis and forecasting;

(f) emissions trading;

(g) energy production and supply;

(h) financial investment;

(i) technology development and diffusion.

Recommending carbon budgets and reporting on progress

The UK Climate Change Act 2008 mandates an emissions reduction target for 2050, and the processes for setting interim carbon budgets. The Act requires the Government (through its Secretary of State) to take into account the advice of the Committee on Climate Change, along with any representations made by other national authorities. The Committee's input includes advice on whether the 2050 target should be amended, and on the level for interim carbon budgets. The legislation requires that if the Government sets the carbon budget at a different level from that recommended by the Committee, the Secretary of State must also publish a statement setting out the reasons for that decision (UK Government 2008, section 9).

The UK Committee on Climate Change is required to report annually to Parliament on the UK's progress towards meeting its carbon budgets. To date, the Committee has published two progress reports (in October 2009 and June 2010) and will publish its third report in June 2011.

In May 2011, the UK Government announced that it proposed to set an ambitious target in law to reduce greenhouse gas emissions in line with advice from the independent Committee on Climate Change. The UK's Fourth Carbon Budget of 1950 million tonnes of carbon dioxide equivalent (net emissions) puts it on a course to cut emissions by at least 80 per cent by 2050. In setting this level in law (by end June 2011), the government intends to achieve a 50 per cent reduction from 1990 levels over the five year period from 2023 to 2027.

Assessing progress on adapting to climate change

An Adaptation Sub-Committee was established in the UK Committee on Climate Change in April 2009. The Sub-Committee supports the Committee in its analysis of how the UK is adapting to climate change. The Sub-Committee provided its first report to the Government in September 2010 (UK Adaptation Sub-Committee, 2010) and will provide formal advice on the UK's Climate Change Risk Assessment (as required by the Climate Change Act 2008) in mid-2011. Adaptation policy is coordinated through the UK's cross-government Adapting to Climate Change Programme, which is currently undertaking the groundwork for the government's first statutory Adaptation Programme to be put in place by 2012 as set out in the UK's Climate Change Act (2008).

3.3 Coverage and reviews for extending coverage of the scheme

Coverage of Australia's emissions trading scheme should be as broad as possible. However, because of unresolved issues relating to emissions measurement, estimation and administration, full coverage of the land sectors from the beginning of a scheme is not recommended. In Update paper four, *Transforming rural land use*, I recommended that emissions reductions from the land sectors under the Carbon Farming Initiative be linked to the emissions trading scheme from

scheme commencement and that the inclusion of agriculture and land sectors in the scheme be reviewed in 2015 to coincide with the possible inclusion of agriculture in New Zealand.

The Independent Committee should undertake this review in 2015 and examine the barriers to full coverage of the land sectors in the emissions trading scheme. The review should examine experience with measuring and administering offsets for land-based emissions within the Carbon Farming Initiative. It should also consider the extent of participation in sale of offsets within the Carbon Farming Initiative, and developments in New Zealand and other producers of temperate and tropical farm products.

3.4 Ongoing review of the emissions trading scheme

The emissions trading scheme should be swiftly revised in response to the recommendations of regular, transparent and independent reviews. Reviews should be conducted regularly by the Independent Committee, with the first review concluded before the planned move from a fixed to a floating price in mid-2015. Subsequent reviews should take place every five years, although the Independent Committee should report annually on the operations of the scheme in conjunction with ongoing reporting by the Independent Carbon Bank.

3.5 Assistance to emissions-intensive, trade-exposed industry

As noted earlier, the Independent Agency should be responsible for developing the approach to emissions-intensive, trade-exposed industry assistance beyond the first three years of the scheme. During the first three years assistance would be based on the Government's 2009 arrangements, adjusted for the removal of the global financial crisis buffer (see Update paper six, *Carbon pricing and reducing Australia's emissions*).

The Independent Agency should develop a suitable work program to ensure priority sectors are considered early in anticipation of the switch to the new approach. Priority should be given to data collection and analysis on emissions-intensive, trade-exposed industries which are receiving the largest amount of assistance: aluminium, alumina refining, petroleum refining, cement, and iron and steel. These industries and activities together account for about 70 per cent of emissions-intensive, trade-exposed industry assistance under the Government's proposed Carbon Pollution Reduction Scheme.

The Independent Agency should be supported by an advisory group that includes technical specialists who are accustomed to working on global pricing models within the main emission intensive, trade exposed global companies, including major multi-nationals, advising on methodology and data sources.

The shift from the interim to a principled approach to emissions-intensive, trade-exposed industry assistance should occur in mid-2015, unless the Independent Agency finds that the data requirements for the new approach have not been met for some industries. If such a decision is taken, the interim arrangements for the first three years should be continued for industries for which detailed assessments within the principled approach have not yet been made. For these industries, the Independent Agency should review on a yearly basis whether the requirements to move to the new approach have been met and provide recommendations to Government. Should the interim approach be extended beyond 2015 for any industry or industries, the Independent Agency should provide a set of recommendations on any required modifications to the interim approach.

Once a move from the interim to the principled approach has been made, the Independent Agency should continue to provide advice on the operation of the assistance regime, including advice on when global carbon pricing has progressed to the point where there is no longer an economic justification for emissions-intensive, trade-exposed industry assistance for Australian firms.

Once the new arrangements for assistance are in place, the assistance program would be operated and administered by the Carbon Bank. The Independent Agency would undertake regular benchmarking and other assessments to determine appropriate rates of assistance which the Carbon Bank would administer after the 3-year interim period as established by the authorising Act of Parliament. The Independent Agency should also regularly review the effectiveness of the assistance program and review whether such assistance continues to be in the national interest.

3.6 Ongoing integrity and regulation of the scheme

The Carbon Bank would be responsible for the ongoing regulation of the emissions trading scheme. Its roles would include overseeing:

- permit issuance through auction or sale under the fixed price period,
- the compliance regime;
- firm-level assistance for emissions-intensive trade-exposed industry;
- stability of the scheme by monitoring carbon markets domestically and internationally and acting to ensure flexible price trading remains on a sound footing; and
- Australia's National Registry of Emissions Units.

Most but not all of these responsibilities correspond to responsibilities proposed for the Regulator of the Carbon Pollution Reduction Scheme in 2009 (refer Appendix 1). Providing the Carbon Bank with policy flexibility to ensure the ongoing stability of the scheme is similar to the role the Australian Prudential Regulation Authority plays in ensuring the stability of Australia's financial services industry (see Box 2).

Box 2: Governance of Australia's financial services industry

The role of regulator of the Australian financial services industry is undertaken by the Australian Prudential Regulation Authority (APRA), a Commonwealth statutory authority established under the *Australian Prudential Regulation Authority Act 1998*. Operating under laws determined by the Australian Parliament, APRA's high-level powers for the prudential supervision of institutions are derived from this Act and from specific industry legislation.

APRA's functions include:

- (a) regulating bodies in the financial sector in accordance with other laws of the Commonwealth that provide for prudential regulation or for retirement income standards
- (b) administering the financial claims schemes provided for in the *Banking Act 1959*, and the *Insurance Act 1973*
- (c) developing the administrative practices and procedures to be applied in performing that regulatory role and administration.

APRA establishes and enforces prudential standards and practices designed to ensure that, under all reasonable circumstances, financial promises made by institutions they supervise are met within a stable, efficient and competitive financial system. It acts as the national statistical agency for the Australian financial sector and plays a role in preserving the integrity of Australia's retirement incomes policy.

In performing and exercising its functions and powers, APRA is to balance the objectives of financial safety and efficiency, competition, contestability and competitive neutrality and, in balancing these objectives, is to promote financial system stability in Australia. APRA's prudential standards set out minimum capital and risk management requirements, which are legally binding. APRA also has responsibility for administering the Government's Financial Claims Scheme. APRA also has a role in explaining to the financial sector and the wider public that rationale for prudential regulation, the role of the regulator and the outcomes that can be reasonably expected from the prudential regulatory framework.

APRA, with the Australian Securities and Investments Commission and the Reserve Bank of Australia, work to ensure a coordinated approach to the resolution of issues relating to the stability of the financial system. Together with the Commonwealth Treasury, these agencies form the Council of Financial Regulators, which provides advice to the Australian Government on the adequacy of Australia's financial regulatory arrangements.

Under section 12 of the APRA Act, the Minister is able to give APRA a written direction about policies it should pursue or priorities it should follow, but must not give direction about a particular case. Thus APRA has complete independence in relation to the performance of its functions and exercise of its powers in relation to a specific matter.

Extracts from APRA Brochure "Protecting Australia's depositors, insurance policy holders and superannuation fund members" and "Governments Statement of Expectations" available at <http://www.apra.gov.au>.

4. Complementary governance recommendations

4.1 Enhancing energy security – The Energy Security Council

The Government proposed in 2009 to introduce an Energy Security Assurance Mechanism (DCC 2009) in the context of the then proposed Carbon Pollution Reduction Scheme. In Update paper eight, *Transforming the electricity sector*, I proposed the introduction of an Energy Security Council with the role of governing a mechanism that is analogous to the Energy Security Assurance Mechanism. This should be a general regulatory enhancement of the National Electricity Market. The case for this mechanism does not depend on the introduction of a carbon price, as it is designed to deal with contagion risks that may arise from several causes.

The establishment of an Energy Security Council could enhance existing regulatory arrangements and provide governments with a mechanism to respond to financial and contract market instability and contagion risks. Consistent with the proposal in 2009, the Energy Security Council would include experts from fields of business, public finance, insolvency and the energy market (DCC 2009).

The Council's terms of reference would require it to act only as a last resort to avert contagion. The Energy Security Council will not remove risk from individual participants, directly protect customers or provide compensation to equity holders. This avoids moral hazard influencing the behaviour of market participants.

The Council would respond when approached by a participant, Government or customers concerned about its own or another's financial situation. The distressed party could be any market participant (generator, retailer, or trader). There would be a strong incentive for a distressed party or its counterparty to voluntarily approach the Energy Security Council about an apparent financial weakness, in advance of its manifestation as incapacity to meet financial obligations. Retailer counterparties would have an interest in alerting the Council if a generator dishonours or is in danger of dishonouring a contract.

The Energy Security Council would be authorised by Government to undertake rapid interventions to stabilise the market. It would have a number of instruments at its disposal, including short-term loan guarantees. As speed is required, the provider of the financial response would need to be the Commonwealth Government. However, as the distressed participant is likely to have its business in mainly one or two states, there is a rationale for the state governments to participate in any longer-term arrangement.

I also proposed in Update paper eight, *Transforming the electricity sector*, a temporary Energy Security Loan Guarantee to address the transitional risk in a focused and cost-effective manner. The loan guarantee would be directed to the most emissions-intensive generators. It would be limited in scale and duration. It would be designed so have as close as possible to zero influence on the production decisions of owners and lenders.

The Energy Security Loan Guarantee should be available to the small number of the most emissions-intensive incumbents.

4.2 Governing the Low Emissions Technology Commitment – The Low Emissions Innovation Council

As discussed in Update paper seven, *Low emissions technology and the innovation challenge*, a Low-Emissions Innovation Council should be established as an overarching governing body to oversee and direct Australia's research, development and commercialisation effort in low-emissions technologies and to administer the Low Emissions Technology Commitment. In establishing the Council, it would be important to ensure appropriate linkages with existing initiatives in the innovation and resources and energy portfolios such as the Australian Research Council Linkage Grants program, Commercialisation Australia and the Australian Centre for Renewable Energy.

At the basic research phase of the innovation chain, the Council would be charged with:

- applying the dual criteria of comparative advantage in research and national interest to target funding at appropriate areas for research and development and ensuring that basic research in Australia is connected to relevant activities overseas;
- supporting the delivery of new skills relevant to Australia's transition to a low-emissions economy; and
- determining the parameters of the premium to the proposed Research and Development Tax Incentive (in conjunction with the Australian Tax Office and AusIndustry).

With regard to the demonstration and commercialisation phase of the innovation chain, in the longer term, I recommend that the Australian Centre for Renewable Energy, the body currently charged with administering demonstration and commercialisation of renewable energy initiatives, be moved into the overarching governing arrangements of the Low-Emissions Innovation Council. This will put in place a comprehensive governing body.

In the short term, the administration of policies and programs for supporting demonstration and commercialisation should be strengthened by increasing the Australian Centre for Renewable Energy's independence and expanding the Centre's remit to include all low-emission energy technologies.

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Appendix 1: Governance arrangements under the formerly proposed Carbon Pollution Reduction Scheme (December 2009)

Parliament:

- Setting the medium- and long-term national emissions reduction targets
- Determining which sectors should be covered initially and on what terms
- Determining which additional sectors should be covered as the scheme develops and on what terms
- Deciding general principles for the banking and borrowing of permits
- Deciding the nature and extent of linking between Australia's Carbon Pollution Reduction Scheme and other schemes operating internationally
- Setting the overall quantum of assistance under the Electricity Sector Adjustment Scheme and the Coal Sector Adjustment Scheme

Government (through responsible Minister):

- Setting the scheme caps and gateways (regulations)
- Determining the framework for assistance to emissions-intensive trade-exposed industries (Parliament and the Government, acting through the responsible minister)
- Determining administrative and technical matters related to the Electricity Sector Adjustment Scheme and the Coal Sector Adjustment Scheme
- Withholding further assistance to generators if windfall gains are likely (Minister, but only in relation to generators where the Regulator has assessed that a windfall gain is likely)
- Deciding which methods should be allowed for measuring and reporting emissions
- Managing Australia's assigned amount under the Kyoto Protocol and the Government's registry account
- Determining the range of eligible international units that could be used for compliance purposes
- Providing education on the scheme
- Reviewing the performance of the scheme and the effectiveness of the scheme settings

Expert advisory committee:

To provide advice on:

- The medium- and long-term national emissions reduction targets
- Which additional sectors should be covered as the scheme develops and on what terms
- The framework for assistance to emissions-intensive trade-exposed industries
- General principles for the banking and borrowing of permits
- Allocating carbon pollution permits, including handling auction proceedings
- The nature and extent of linking between Australia's Carbon Pollution Reduction Scheme and other schemes operating internationally
- The performance of the scheme and the effectiveness of the scheme settings

Regulator:

- Deciding whether particular entities are eligible for assistance in the form of permits to be allocated administratively, and the number of other permits to be allocated
- Assessing emissions data to determine each liable entity's obligation to surrender eligible compliance permits
- Monitoring, facilitating and enforcing compliance with the scheme
- Operating a registry to track issues, holdings and transfers of eligible compliance permits
- Providing education on the scheme

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