

# Introduction

I WAS EXPLAINING to the Multi-Party Climate Change Committee early in 2011 how I had worked out the costs and benefits of reducing emissions for the 2008 Review. The costs of reducing emissions will come straightaway. The benefits of reducing damage from climate change will come later—many of them to later generations of Australians. In fact there will be more and more benefits for later and later generations. So I needed a way of comparing the value of income to Australians who are alive right now with incomes of young Australians later in their lives and Australians who are not yet born.

‘So we had to choose the right discount rate’, I said. ‘We can’t use the discount rates that determine values in the share market, because they take into account risks of a kind that are not relevant here.’

I got the feeling that the mention of discount rates had set Prime Minister Gillard’s mind towards what she would say to Hillary Clinton about Afghanistan, Bob Brown’s to the grandeur of the Styx Valley, and Tony Windsor’s to the good rain that was falling on the Northern Tablelands.

But then I said something that brought back the prime minister’s attention.

‘If we used the share market’s discount rate to value the lives of future Australians’, I said, ‘and if we knew that doing something would give lots of benefits now but would cause the extinction of our species in half a century, the calculations would tell us to do it.’

The beginnings of a smile on her face became a hearty laugh.

‘You’ve got us there, Ross’, she said, as the others were infected by the lift in spirits and joined the laughter. ‘That’s a unanimous decision of the committee. We’re all against the extinction of the human species.’

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 model 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 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 calamitous change, strong mitigation was clearly in the national interest.

## **New developments**

And so we come to today. The purpose of this book is to examine how developments in science, diplomacy, political culture and the economy have affected the national interest case for Australian climate change action.

Since the 2008 Review, the science of climate change has been subjected to intense scrutiny and has come through with its credibility intact. The findings continue to be sobering. 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.

Global average temperatures have continued to track a warming trend. The year 2010 ranked with 2005 and 1998 as the warmest on record, with global average temperatures 0.53°C above the 1961–90 mean. For Australia, 2009 was the second-warmest year on record and the decade ending in 2010 has easily been Australia's warmest since record keeping began.

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 temperatures, 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.

New observations of a changing climate include an increase in extreme weather events. The Black Saturday fires in Victoria in 2009 and recent major cyclones in Queensland are both consistent with expected outcomes in a warming world, although we cannot draw conclusions about direct cause and effect.

Other studies since 2008 have confirmed that Australia is also seeing historically unprecedented periods of wet and of dry in different areas of the continent.

Globally, rising sea levels continue to track the upper levels of modelling. Considerable debate is under way about the causes and potential extent of sea-level rise. The latest research suggests that, beyond the effects of thermal expansion, the melting of the great icesheets of Greenland and West Antarctica may contribute much more than was previously thought to sea-level rise. The debate is unresolved but oriented towards higher not lower outcomes.

New research has also contributed to our understanding of ‘tipping points’ in the climate system. These are points at which warming of the climate triggers irreversible damage and a feedback loop for further warming. The new research has focused on identifying and testing potential early warning indicators of an approaching tipping point.

Progress has also been made on ruling out other possible causes of warming, such as changes in the amount of solar radiation reaching the earth. Scientists have identified ‘fingerprints’ of warming that confirm human influence. A primary example is the pattern of warming in the layers of the atmosphere. Under increased greenhouse gas scenarios, climate models predict that the lowest layer of the atmosphere (the troposphere) should warm, while the next layer up (the stratosphere) should cool. This has been confirmed by recent observation. If increased output from the sun were the cause, both layers could be expected to warm. These developments and more are examined in Chapter 1.

Since 2008, advances in climate change science have therefore 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. This has led me to shift my judgment about the reputable science from being right ‘on a balance of probabilities’ to ‘beyond reasonable doubt’.

Chapter 2 focuses on 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.

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 share of emissions growth attributed to large developing nations like China and India has grown as developed countries’ growth has shrunk.

Australia is an exception among the developed countries. Following the Great Crash, Australia’s rich endowment of natural resources has helped fuel the outstanding growth in the large developing countries. The resulting high terms of trade project a strong growth performance based around high levels of investment in mines, including for coal and gas. 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.

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. By 2030, the average income in developing economies will be slightly more than a quarter of that of the United States. The potential for further catch-up growth in incomes and emissions is stark.

However, there has been a major positive development. The world has already moved considerably beyond the business-as-usual case described above. 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.

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 Copenhagen agreement had its weaknesses. The new targets were voluntary, not ruled by legal obligation and delayed the prospect of the trading of carbon permits between countries. But they did establish a new ‘pledge and review’ system that included new mechanisms for measuring and tracking emissions.

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

The pledged targets of all countries that play substantial roles in global emissions are evaluated in Chapter 4. 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.

For developing countries, targets are measured not in absolute reductions but in reductions in emissions intensity. The modified contraction and convergence framework described in the 2008 Review implied a targeted reduction in China’s emissions intensity of 35 per cent between 2005 and 2020 if global concentrations of carbon dioxide were to be limited to 450 ppm. At Copenhagen and Cancun, China pledged to reduce its carbon intensity by 40 to 45 per cent between 2005 and 2020.

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.

## Solutions

So, 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.

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. This exercise was undertaken in detail and with great care for the 2008 Review. 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. The Chinese Government's direct action includes issuing instructions for factories with high emissions to close, subsidising consumers who buy low-emissions products like solar electricity panels and electric cars, and restricting new investment in industries judged to have undesirably high emissions.

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.

One distinct advantage of addressing climate change mitigation 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 for Australian households on low and middle incomes, as well as to offer security to the most vulnerable low-income households.

A carbon price of \$26 will raise approximately \$11.5 billion in the first year and rise over time. Efficiency and equity objectives would be best served by allocating the majority of this revenue to households, perhaps modelled on the kind of tax and social security reforms envisioned in the Henry review.

At the same time, slices of this revenue should also be used to support innovation in low-emissions industries, provide incentives for biosequestration in rural Australia and prevent export industries from being placed at a disadvantage against international competitors that are not yet subject to comparable carbon constraints. Chapter 6 is a national interest analysis of how compensation should be deployed to each of these groups.

Of course, under a direct action or regulatory approach, costs are imposed on households and businesses but none of these benefits are available to balance them.

### **National versus vested interests**

Yet, 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.

It is salutary to recall that Australia, with New Zealand, had the poorest productivity performance of all the countries that are now developed through the 20th century to the mid-1980s. The long period of underperformance had its origins in the domination of policy by business and union vested interests. Political leaders responded to democratic pressures with protection and regulation. There was little competition to prompt firms to seek new, more productive ways of doing business.

We managed to break out of that from 1983 onwards, and entered a remarkable period of productivity-raising reform. After a while, suggestions for policy reform were not taken seriously by anyone unless they were placed in a sound national interest context. The leadership of the Australian Council of Trade Unions responded quickly to the circumstances offered by a new approach to government. To remain relevant to the policy process, the old, protectionist business lobbies were reformed as the Business Council of Australia.

Protective and regulatory constraints on higher productivity were progressively reduced.

The period of policy reform oriented to the national interest lasted until the turn of the century. Productivity responded to the new political culture and the policies that it supported. Australian productivity growth in the 1990s after the recession at the start of the decade was the highest in the developed world.

The end of the era of reform can be dated fairly precisely. No major market-based productivity-raising reform has survived the political process since the tax reform package of 2001. That package was itself deeply compromised by the increased distortions in federal–state financial relations that had been introduced as the political price for reform. And it was bought with ‘overcompensation’ amounting to about a percentage point of Australian national income.

From the beginning of the 21st century, Australian policy making has reverted to type. Business and union organisations refocused on securing sectional gains. Governments responded. There could be no policy change if there were any losers, so there could be no productivity-raising change at all. There has been little increase in the productivity with which resources (capital and labour together) are used in Australia so far in the 21st century, and none at all since 2003.

The absence of total productivity growth over the last decade was covered up for a few years at the beginning of the century by an extraordinary boom in housing and consumption, mainly funded by unsustainable foreign borrowing by our banks. That boom would have ended quickly in tears had we not been rescued by a resources boom—much higher export prices and, after a while, investment in resources—of historic dimensions. Now it will end in tears after a longer period.

This is the problematic political context of the climate change policy discussion.

Some business leaders have recently drawn attention to the need for long views and hard decisions in policy making. They say that the minority Labor government elected by the Australian people in 2010 is weak and lacks long time horizons.

A more accurate accounting would recognise that the current government has taken on the most difficult and long-dated policy reform that has ever been attempted. It has taken on a reform in the national interest that must overcome stronger pressures from sectional interests than any since the contests over protection in the 1980s and early 1990s. That part of big business that is

active in the debate has taken on the role of spoiler. 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.

The same calculation applies to adapting to the degree of climate change that is already locked in regardless of mitigation efforts from this time forth. Chapter 8 looks at the likely adaptation measures that will be required. The key to success and greatest efficiency will be maintaining a productive, flexible, market-oriented economy.

### **The independent centre**

I noted in the 2008 Review that the diabolical policy issue of climate change had a ‘saving grace’ that may make all the difference—that climate change is an issue in which a high proportion of Australians are deeply interested. This provided an opportunity for the exercise of authority by an independent centre, against the claims of interests that see themselves as being negatively affected by mitigation. My consultations and community engagement through the update of the Review have confirmed the continued presence of the saving grace, although it has been tested by the bizarre quality of the public discussion of recent times.

In confronting the spoiling voices, we must remember that rejection of current proposals for carbon pricing would not end the debate over climate change policy. It might, however, end the possibility of action at relatively low cost.

The increasing impact of climate change as well as policy developments abroad would prompt continued pressure for new policy in Australia. Inaction by Australia, with the highest emissions per person in the developed world, would invite retaliation in trade and other areas of international cooperation. If current efforts on carbon pricing failed, debate would continue over how much Australia should do and how we should do it. This would continue to raise the supply price of investment in businesses that might be affected by restrictions on emissions. The political system would respond to continued community interest in and pressure for action on climate change by myriad costly interventions. The failure of current efforts to place a price on carbon through much of the economy would open the way to a long period of policy incoherence and instability.

There is no reason why carbon pricing should continue to be a matter of partisan political division in Australia. In much of the world—perhaps everywhere except Australia and the United States—concern for global warming is a conservative as much as a social democratic issue. The conservative governments of Germany, the United Kingdom, France and the Republic of Korea are playing important global leadership roles. Even in the United States, the most effective political leadership on climate change has come from a Republican governor of California and a Republican mayor of New York.

A concern to avoid dangerous climate change fits naturally within the conservative tradition. It may be rational for the radical to risk the institutions of human civilisation in a throw of the climate change dice, just as Lenin saw merit in inflation in the capitalist countries. The radical may hope that the outcome will open the social and political order to new shapes. It is strange for the conservative to embrace such risk.

Nor do the characteristic divisions between the conservative and social democrat argue for conservative opposition to carbon pricing. Market-based approaches to mitigation sit as easily with a conservative party that is self-described as liberal, as they do with social democratic parties.

It would be open to current or future leaders of the conservative side of Australian politics to take over ownership of carbon pricing arrangements once they are in place. The interests of their future governments, as well as those of Australia, would be served well by the continuation of carbon pricing.

## **Transformations**

The Member for New England in the House of Representatives, Tony Windsor, has commented that if the whole world really were doing nothing, there would be no point in Australia seeking to reduce greenhouse gas emissions. We might as well join the other lemmings as they rush over the high bluff.

Fortunately for humanity—and in particular for Australians as residents of the country in the developed world that is most vulnerable to climate change—much of the rest of the world is not behaving like lemmings.

Despite the raucous disputation and associated inaction in Australia, other countries have kept alive the possibility of effective global action. There is substantial action in many countries to constrain greenhouse gas emissions, but the future shape of international action could evolve in a number of different ways. Australian policy should seek to shape that evolution in line

with our national interest in effective mitigation of climate change, while calibrating Australian policy to what others are doing.

Both the Australian Government and the Opposition have committed themselves to a minimum reduction of emissions of 5 per cent by 2020. This book defines a process through which we would adjust that share over time in light of what others were doing.

If we commit ourselves to doing our fair share, and maintain that level of commitment through the governance mechanisms recommended in this book, there can be a smooth adjustment to increased international effort. 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.

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 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 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.

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.

This 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.