

CHARTING THE COURSE TOWARDS A LOW CARBON ECONOMY¹

Dr Martin Parkinson, Secretary, Department of Climate Change

Trevor Swan Distinguished Lecture in Economics

Canberra, 27 November 2008

Introduction

It is a great honour to be invited to speak on climate change policy as part of the series of Trevor Swan Distinguished Lectures in Economics.

Professor Trevor Swan was one of the giants of the economics profession in Australia, making profound contributions to theoretical and applied research, and to policy-making, which have been recognised globally.²

Trevor Swan developed the first macroeconomic model of the Australian economy – the second in the world after Tinbergen’s pioneering effort. He identified the importance of aligning policy instruments and targets with his work on internal and external balance. And he was a pioneer of our profession’s modern work on the sources of economic growth. His focus on the sources of growth are reflected in our concern to design policy that delivers both reductions in emissions and sustained economic growth.

While climate change was not perceived as a problem during Trevor Swan’s life, I suspect it is just the sort of issue that would have attracted his attention were he alive today. As Butlin and Gregory have noted, Swan imposed the constraint of reality and social purpose on his work.

Indeed, those of us grappling with understanding the economic consequences of climate change and with developing policy responses are using tools and frameworks that have some of their antecedents in his work. To take one example, his pioneering work on macro-economic modelling paved the way for us to be able to have reasonable confidence that we understand the macroeconomic consequences of major shifts in economic policy, such as introducing a price on carbon.

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Recent years have seen a significant accumulation in our understanding of climate change, its sources and impacts.

The weight of the science makes a compelling case that human-induced climate change is a reality. Notwithstanding this, the complexity of the climate system means

¹ I would like to thank David Gruen, Barry Sterland, Jan Adams, Steve Hatfield-Dodds, Kath Rowley and Julie Gilfelt for their assistance in preparing this address.

² *Trevor Winchester Swan, 1918-1989*, by Noel Butlin and Bob Gregory (Economic Record, 1989) and the introduction to the ANU Inaugural Trevor Swan Distinguished Lecture, given by Peter Swan, provide comprehensive elaborations of Trevor Swan’s contribution to academic economics and public policy.

that many aspects of climate change and climate policy are characterised by uncertainty.

This is not unusual, or unique to climate change. Uncertainty is a fact of life. The task is to manage these risks and position ourselves to prosper in an uncertain future.

It is this uncertainty that prompted me to call today's presentation 'charting the course towards a low carbon economy'. In a sense, my subtitle is that economics provides a good framework for managing the multiple uncertainties involved in responding to climate change.

Unfortunately, the complexity and uncertainty associated with the issues is used by some as an excuse to do nothing. But even were one to harbour some doubts about whether climate change was real, the rational agnostic should wish to take some action now. For the agnostic, action today can be thought of as being analogous to taking out insurance or hedging one's position. It involves incurring a cost now, with the prospect (but not the certainty) of gaining in the future. And as the Treasury modelling³ and the Garnaut Report⁴ have illustrated, the cost is moderate and the likely benefits very significant.

To cut to the chase, I consider decisive action on climate change is the only prudent and rational response to the global risk management problem we face. The Garnaut report provides a comprehensive analysis of both the science and the case for action. This case is overwhelming. In this address I will, therefore, focus on more relevant policy issues of how and when to reduce greenhouse emissions.

In particular, I will focus on three core questions that shape the work of governments around the world as they consider their responses to climate change.

The first question concerns the nature and scale of the costs of responding to climate change. Here I will be drawing on insights from the Treasury's economic modelling of the impacts of introducing the Carbon Pollution Reduction Scheme (CPRS). Understanding the underlying causes of these potential impacts, and their implications for policy design, will frequently be more important than judgements about the precise scale of these impacts.

The next two sections follow from this. The Treasury work models the impact of an efficient policy framework – one that relies on market forces to drive efficient abatement over time. However, for some this policy framework is not accepted. The second section of the presentation focuses on defining the desirable role of government and the set of policies that it should employ as a part of a comprehensive and efficient response to climate change. In particular the focus is on the notion of 'complementarity' – that policies outside the market mechanism should complement that mechanism so as not to risk increasing compliance and other costs without contributing to the desired policy outcome.

³ Australia's Low Pollution Future, The Economics of Climate Change Mitigation, The Treasury, October 2008.

⁴ The Garnaut Climate Change Review, Final Report, September 2008.

The third and final section considers the political economy of international action, and the prospects for achieving a robust and worthwhile agreement. This question is relevant for understanding the costs and benefits of domestic action, and the issue has come up in the context of the Treasury modelling of the international environment. More broadly, economic theory and analysis – in conjunction with insights from other disciplines – has an important role in helping policy makers understand the consequences of different emissions pathways for the prosperity and security of nations, with implications for the underlying prospects of achieving an agreement.

2. Understanding the causes and scale of climate policy impacts

Economic modelling of emissions reductions provides valuable insights into the costs and benefits of taking action to mitigate climate change, and the economic impacts of different levels of action.

The Garnaut Climate Change Review drew on modelling by the Department of the Treasury and others to compare the long-term costs to Australia of two scenarios where action is taken to stabilise global concentrations of atmospheric greenhouse gases, relative to a scenario with no mitigation of Australian or global emissions.

The first key finding of the Garnaut Final Report was that the long term economic costs of inaction are greater than the costs of action. This judgement rests on a detailed assessment of the benefits to Australia of global mitigation, including a range of benefits which were not able to be modelled.

The second key finding was that, of the three scenarios examined, an effective global agreement delivering stabilisation of global atmospheric concentrations of greenhouse gases at 450 parts per million of carbon dioxide equivalent (ppm CO₂e) would provide the most benefit to Australia, largely because stabilisation at higher levels would result in significant costs and residual risks to Australia and our region. These findings are broadly consistent with other assessments, such as the UK's Stern Review (2006) and analysis by the USA's Centre for Strategic and International Studies (2008). Professor Garnaut also concluded, however, that the prospects were poor at this point for achieving a 450ppm outcome in the current round of negotiations: and he suggested that Australia set its 2020 targets consistent with a 550ppm outcome to assist in generating the momentum required to achieve more ambitious action over time. I will return to this issue later.

In parallel with its work for Professor Garnaut, the Treasury modelled the costs of achieving emissions reductions in scenarios incorporating the design features of the scheme as outlined in the July Green Paper. The two 'CPRS' scenarios deliberately incorporate a more realistic representation of global action, where different groups of nations begin emissions reductions or restraint at different times. Advanced countries, such as Australia, take action from 2010, while China and high-income developing nations take action from 2015, India and medium-income developing nations from 2020 and low-income developing nations from 2025.

It is difficult to characterise these scenarios as over optimistic, as some have suggested. Action by developing nations initially involves reductions in emission growth, not reductions in emissions levels – for China, emissions allocations peak around 2030 and for India around 2040. Emissions reductions within each group are benchmarked as a common level of effort relative to the reference case projected for

each nation. This means, for example, that effort by all advanced economies is commensurate with the Australian targets for 2020 and 2050 in the CPRS scenarios.

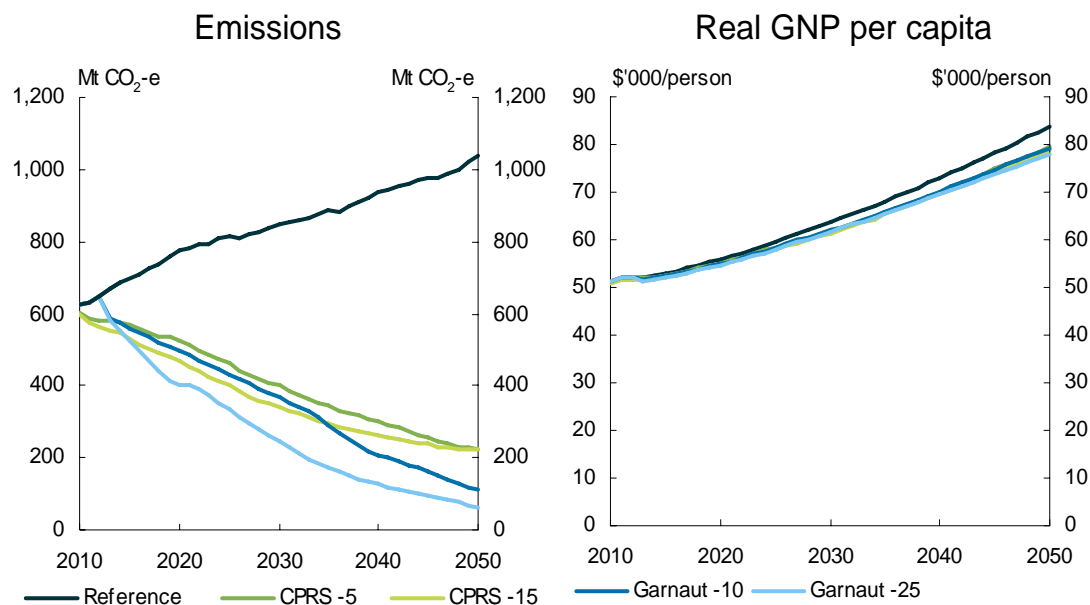
The important issue here is not the individual year in which different groups of countries commence action, but that it is an attempt to model the political reality – that action will be staged.

The work represents one of the most comprehensive modelling exercises ever undertaken in Australia, and I commend the Treasury report to you as containing a wealth of information and analysis.

Given that, I would like to highlight three major insights,

First, reducing Australia's emissions is consistent with maintaining strong trend economic growth (with trend GDP growth of 2.2-2.3 per cent per annum across different scenarios to 2050, rather than 2.4 per cent without policy action).

Chart 1: Australia's emissions reductions under four scenarios and corresponding GNP per capita



Source: Treasury(2008) *Australia's Low Pollution Future*

Second, deferring action to reduce emissions risks higher long term costs, both for individual nations, and for the world as a whole. Countries that move ahead of eventual global action gain because gradual action is less disruptive and costly than achieving more rapid reductions from a higher level of emissions – that is, the longer we wait the larger the investment in emissions-intensive assets and infrastructure that we ultimately need to replace. This is reflected in higher returns on investment in the nations that take early but gradual action. Similar logic holds true for the world as a whole. Modelling a seven-year delay in global action finds that achieving the same level of abatement over a shorter timeframe increases global costs by 10 per cent in 2050 with the costs remaining higher for the rest of the century. This is a powerful

argument against procrastination, even before including the additional direct costs of climate change that would be expected under a delayed action scenario.

Third, many of the economic impacts on Australia are driven by the actions taken by other countries and the features of global agreements, rather than by the level of domestic action to reduce Australian emissions. This is consistent with the view I have put elsewhere that Australia has twin vulnerabilities to the impacts of climate change and to the impacts of poorly designed policy responses elsewhere.

Modelling of two scenarios based on the CPRS with emissions reductions targets of 5 and 15 per cent below 2000 levels by 2020 found that GNP grows by around 23 per cent from 2010 to 2020 with policy action, rather than 24 per cent without climate policy action. This is equivalent to foregone an increase of up to 1.7 per cent in GNP in 2020, or a delay of around four months in achieving the same level of GNP.

This points us to a more fundamental insight from economics. Over the long run, with an open approach to international linkages, the degree of structural adjustment in Australia, and the economic cost we bear, will be largely driven by international factors, rather than by our national target. This point is not well understood in the Australian debate where the focus to date has been entirely on the domestic trajectory as an indicator of economic cost.

There are two major routes for this impact. The first is that stronger action by major economies to reduce emissions will impact on Australia through its energy intensive exports, and hence its terms of trade. The second key driver is that the international carbon price will be higher the more ambitious international action is – this flows from the greater demand for abatement from major emitters. Of course, the dividends in terms of avoiding dangerous climate change will also be greater: hence such an outcome is clearly in Australia's national interests.

In this world, investment decisions will be shaped by Australia's competitive advantages in a low carbon world. These advantages will reflect the carbon price, and the emissions intensity of different activities relative to those activities in other nations.⁵ Our target will reflect our contribution to global action, but most directly through affecting the flows of permits required, rather than the underlying structure of our economy. Targets will therefore have an important impact on the divergence of GNP from GDP. But in the long run, it will be the international carbon price that shapes the pattern of emissions intensive activities, here and abroad. As is the case with Australia's key commodity markets, domestic players will need to focus far more on the likely course of international events in judging the impact of the carbon market on their business.

As an aside, for those of you who remain unconvinced of the relative moderate impact on growth projected in the modelling, I would encourage you to read David Gruen's recent CEDA presentation⁶ where he highlighted the economic cost of each of the

⁵ This impact will be muted by the fact that competitors (countries/industries) will face similar conditions meaning the impact will reflect changes in global demand.

⁶ "The Economic Costs of Reducing Greenhouse Gas Emissions: Understanding the Treasury Modelling" CEDA National Forum, 11 November 2008.

modelled scenarios is around one-fifth of the impact on Australia's growth rate arising from the aging of our population!

3. Establishing the policy framework

While the Treasury modelling was not predicated on a perfect world of international cooperation emerging instantaneously, it is positive about the direction, assuming we will get the policy framework basically right. It also assumes that Australia introduces a robust, broad based and market based approach to emissions reduction. That is what the Carbon Pollution Reduction Scheme is all about.

Most of us agree that it is good to understand a problem before prescribing a solution, though experience suggests that policy debates in Australia sometimes more accurately constitute solutions in search of a problem!

Understanding the problem before attempting to fix it is the basis for the theory of market failure, the foundation of economic approaches to 'structural policy' and, increasingly, the governance and regulatory dimensions of macroeconomic policy.

The essence of the theory of market failure is that policy-makers should seek to understand why something is not working – why the market fails to deliver what we want – before intervening or tinkering with the system. This is sound advice, so let's start with a few of the attributes of the climate change problem.

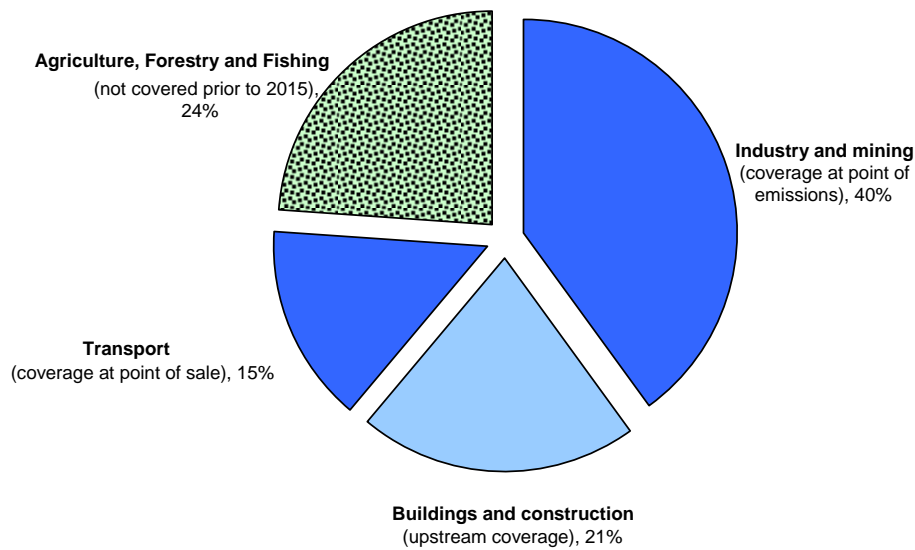
Human activities over the last 100 or more years have resulted in significant increases in global emissions of greenhouse gasses. The accumulation of these gases will cause harm to human well-being and natural systems – this is a classic negative externality, that is more than usually complicated by its essential global nature.

It is clear that the accumulation these gasses is already changing the dynamics of our climate system, resulting in trend increases in temperature; changes in rainfall patterns, including changes in the frequency and intensity of storms; sea level rise due to thermal expansion of the oceans; and other impacts.

These basic dimensions of climate change give rise to the two fundamental arms of climate policy: mitigation, which refers to reductions in greenhouse emissions, and adaptation, which includes all the processes of learning to live with an altered climate. While these policy areas are not entirely separable, tonight I will focus primarily on issues in reducing emissions.

Australian emissions can be divided into four broad sectors, or types of activities, to which we can attribute both their direct emissions and their indirect emissions, including those from electricity. The bulk of Australia's emissions come from two of these: heavy industry (which includes mining) and transport. Together they account for more than half of total emissions by end use, with heavy industry and mining accounting for around 40 per cent and transport accounting for around 15 per cent. The building and construction sector accounted for around 20 per cent of emissions in 2006, primarily through their use of electricity. The last broad sector is agriculture, forestry and fishing (which includes land use change) which accounted for 24 per cent of emissions in 2006 when we count both their direct emissions associated with livestock and their inputs like fuel.

Chart 2: Australian emissions by major sector, 2006



Sources: *Department of Climate Change and National Greenhouse Gas Inventory by Economic Sector, 2006*

Let me make a few observations about this simple chart as a way of outlining the approach the government is taking to reducing Australian emissions.

The first is that the bulk of our emissions come from the sectors shown in blue: heavy industry, mining, and transport fuels, including electricity use. The emissions associated with these activities typically derive from large businesses and are the principle focus of the CPRS.

The CPRS proposes the development of a financial market – the emissions trading scheme – designed to deliver an environmental objective by placing an explicit price on the emissions of greenhouse gases.

The ultimate objective is not, however, the creation of a trading scheme – that is simply a tool. Rather, the policy objective is to help the world avoid dangerous climate change. The CPRS aims to do this by demonstrating that it is possible to deliver significant emissions reductions while delivering sustained prosperity, positioning Australia to reap the opportunities flowing from the move to a low-carbon world in the process.

Placing a price on greenhouse gas emissions – carbon pollution – is key to ensuring that strong economic growth can be sustained. The creation of a robust carbon market will provide information on the carbon price now and into the future – it will provide a powerful incentive for consumers and business to switch to lower carbon products and production techniques, change investment patterns, and encourage greater efforts in new and innovative areas of research and development.

While the pattern of abatement will not be even across sectors – reflecting the marginal cost of the different sets of abatement opportunities open to different industries – it will ensure that the abatement target is delivered at least cost to the economy.

It is worth reflecting on this for a moment.

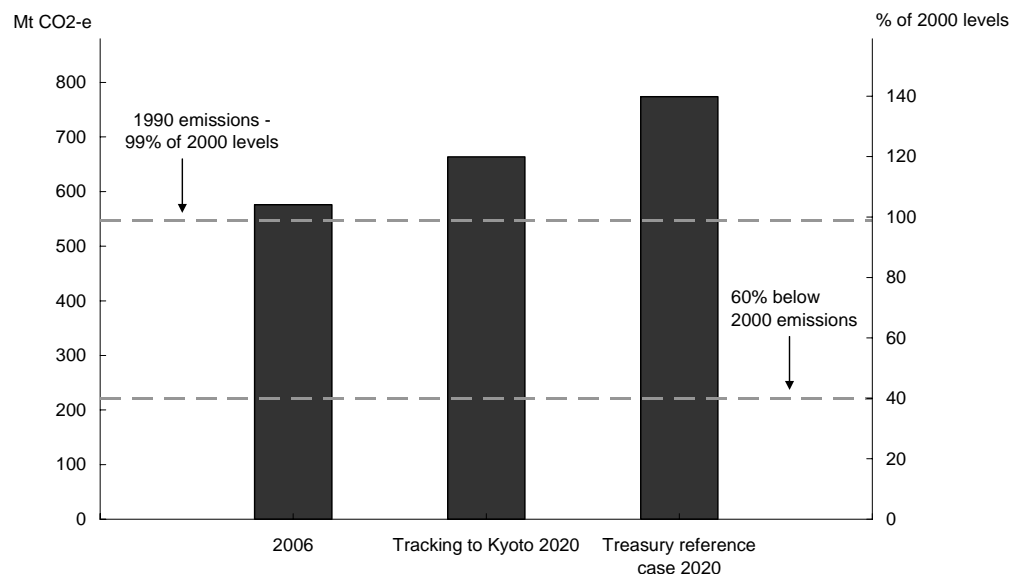
To achieve the same outcome using a regulatory approach, the Government would need to know the whereabouts and cost of every existing and future abatement opportunity, which is clearly impossible. A regulatory approach would therefore certainly impose a greater cost on the economy than a market-based approach.

A more fundamental point is that the magnitude of the emissions reductions required to avoid dangerous climate change cannot be achieved through regulatory approaches.

Let me repeat that: we can only protect the planet through harnessing the market. Emissions trading, or an equivalent market-based policy, must be central.

Let me illustrate this. In Australia, net emissions grew very little between 1990 and 2000 due to one-off reductions in land clearing that offset trend growth in energy related emissions.

Chart 3: Australian emissions 2006 and 2020



Sources: DCC data and *Australia's Low Pollution Future*

As shown in Chart 2, by 2020 emissions are projected to be around 20 per cent above 2000 levels with current policy measures, before taking account of the CPRS. In contrast, the Treasury reference case projects that emissions would be around 40 per cent above 2000 levels in a world without either climate change or new climate policies such as the expanded Renewable Energy Target.

Putting Australia on track to reduce emissions by 60 per cent from 2000 levels by 2050 is, therefore, an enormous challenge - perhaps the greatest structural reform ever undertaken in our country.

Returning to the four main types of activities that drive our emissions profile shown in Chart 2, the second observation is that the Government proposes to bring these emissions into the scheme in different ways.

Heavy industry is, in general, liable at the point where emissions occur, with the scheme imposing liabilities on around 1,000 businesses. As this 1,000 includes electricity generators, downstream use of electricity is covered indirectly, reducing transaction costs but serving the purposes of the scheme by including the carbon price in the price of electricity. Transport fuels are included at the point of sale, rather than the point of combustion, again achieving the desired price signal with low transaction costs. Overall this achieves broad coverage with low compliance and transaction costs.

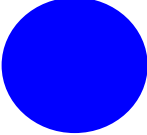


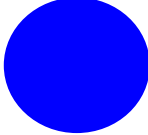

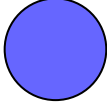
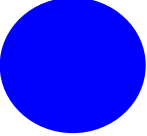

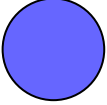


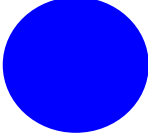

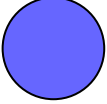
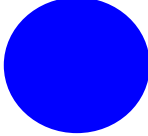
The Green Paper proposed that direct agricultural emissions should not be included in the scheme at commencement in 2010. Australia has over 150,000 farm businesses, including 89,000 livestock operations. While emissions from these operations – typically fertiliser and livestock related – are generally well below the scheme threshold, the sector as a whole is such a large emitter that the Government has indicated a preference for the eventual inclusion of agriculture in the emissions trading scheme, with decisions to be made in 2013. Before that can be done, considerable effort is needed to see whether it is practical to impose liability for livestock emissions on-farm or at some stage after the farm gate. The use of fuel and electricity will, however, be captured by the decision to place the liability on the upstream supplier.

A third observation that can be drawn from Chart 2 is that buildings and ‘non-heavy industry’ account for a significant share of indirect emissions, because of their energy use. Such entities are not, however, directly included in the scheme as the liability falls on the upstream supplier of energy, the electricity generator.

I would now like to return to a more explicit discussion of the role of government in addressing climate change through encouraging emissions reductions.

The Garnaut Review, Productivity Commission, and other economic literature identify a range of market failures relevant to greenhouse emissions and energy use. Indeed, Nicholas Stern describes climate change risks as “a consequence of the greatest example of market failure we have ever seen” (Stern 2007).

Chart 4: Significance of climate change related market failures

	Pollution <i>Climate damage</i>	Information <i>Bounded rationality</i>	Investment <i>Split incentives</i>	Infrastructure <i>Economies of scale</i>	Innovation
Industry and mining					
Buildings and construction					
Transport					
Agriculture					

Source: Department of Climate Change

The first and most important market failure is the negative externality associated with greenhouse pollution. In textbook language, the release of greenhouse gases imposes an uncompensated cost on people or firms who are not parties to the transaction or economic activity generating these gases. As a result, decision-making takes little account of these costs, and the result is a socially sub-optimal level of pollution. As Professor Garnaut notes: “The failure to price these gases has led to over-utilisation of a scarce resource: the atmosphere’s capacity to absorb emissions without risks of dangerous climate change” (Garnaut 2008, Chapter 13).

This market failure will be substantially addressed through the introduction of the CPRS, which limits access to this scarce resource by Australian emitters, and allows a price to emerge through establishing a market in emissions permits. The ‘cap and trade’ approach is only one approach to introducing a carbon price. Of necessity, given the absence of a benign single world government, the introduction of emissions pricing must be done by and through national governments. This gives rise to a number of important coordination issues, particularly the treatment of trade-exposed emission-intensive goods.

But the crucial point is that the pollution externality is not the only market failure associated with climate change, and so the introduction of emissions trading alone will not constitute a sufficient response to the challenge of climate change.

Other market failures interact with the major pollution externality. Any list of relevant market failures will involve some judgement, but four that seem particularly important for Australia provide the headings for Chart 4.

- Information failures associated with bounded rationality mean that economic agents do not seek out information even though the expected benefits of information search exceed the costs. This implies that there is a case for government to alert people to the potential benefits of energy efficiency options – and sometimes intervene through well targeted regulations (e.g. minimum energy efficiency standards), so that the costs and benefits of these options are properly considered.
- Split incentives can block worthwhile investment, such as where landlords are not able to recover the capital cost of energy efficiency improvements and tenants are left paying higher than necessary costs.
- Market failures in the provision of infrastructure, such as economies of scale that give rise to monopoly power or – at the other end of the scale – non-excludability issues that require direct public funding or provision. The first of these is relevant to the supply of network infrastructure for electricity generation where establishing the network provides broad benefits to society but costs must be borne disproportionately by pioneering investors. The second is relevant to transport infrastructure, where market signals can only arise in relation to existing services or options. You can vote with your feet or your wheels, for example, when choosing between driving a car to work or using existing public transport. But it is very difficult to use your wallet to signal your desire to use a train if the line has not been built. Government policy choices about network provision thus frame the options available to individuals and businesses, and so can constrain or empower action to address climate change. This means that it will be increasingly important for the planning and funding of infrastructure to take account of climate change policy issues
- Barriers to innovation. It is well known that the benefits of successful innovation are difficult to capture due to imperfect intellectual property rights. This results in under-investment across the innovation spectrum, from basic research through to applied innovation in work and operational practices. These innovation barriers are exacerbated by the basic pollution externality, and the fact that future returns to successful innovations will be strongly influenced by the government policy settings that will together determine future carbon prices. While I would not be too definitive, it strikes me that this sovereign risk issue may be more significant in the areas of energy than in other areas of research. For Australia agricultural research will always have very specific applications and so will be particularly relevant.

It is this set of interacting market failures that give substance to the notion of complementary policy measures.

The lack of a carbon price signal is fundamental, and no long term policy solution is possible without the creation of incentives to protect the integrity of our climate system and reduce the risks of dangerous climate change.

But it needs to be complemented by other measures. These include support for the development of new low-emissions energy technologies, integration of climate considerations into transport planning, provision of general energy efficiency information, and addressing split incentives in rental markets. In some cases, the

merits of complementary action need to be explored in more detail, such as whether Australia should introduce ambitious mandatory fuel efficiency standards. At the same time, these other policies make little sense without an overarching price signal.

Equally, though, it will be important that existing policies are effectively assessed to ensure they are truly complementary. There is a plethora of policies across all levels of government in Australia that need to be revisited:

- some should be removed because they were designed to substitute for the absence of an explicit carbon price;
- others have a transitional role to play but should be phased out as the emissions trading scheme matures; while
- still others have no emissions abatement rationale at all but were introduced for other, often industry policy, reasons under the guise of climate action.

Truly complementary measures should be targeted to areas of real market failure. In all cases, policies need to be well designed and implemented, and need to demonstrate that the benefits of government action outweigh the costs.

If we do not rise to this task then the costs of mitigation will indeed be higher than they need to be. This risks policy action being less than required, and perhaps even that it is politically unsustainable. With a sound approach, however, we will be able to reduce emissions while protecting our growth prospects.

4. Economic insights into the prospects for a worthwhile international agreement

The last issue that I would like to explore relates to the prospects for achieving global commitment to making deep cuts in emissions.

Economics is often described as the dismal science. I think that honour has now passed to the climate science community, particularly those who project the impacts of unmitigated climate change. But some economists continue to vie for the title, particularly with pronouncements about the disposition of nations to free ride, and the difficulties associated with achieving a global agreement on costly emission reductions.

I do not want to understate the challenge of crafting a worthwhile agreement. But neither do I want to understate the potential for nations to act in their collective long-run interest.

Essentially, we face a classic game theory problem.

Everyone accepts the need for action, but some need to make the first move – to build confidence that cuts in emissions are not excessively costly with the right mechanisms – before others will commit. And the first movers need comfort that they will not be isolated – that is, that they will not do damage to their economies with no environmental benefit because others then refuse to act. Of course, those who move first have the option of punitive sanctions on those who fail to contribute over time, but we would all prefer a win-win to a lose-lose outcome.

The result is that no action is likely before a group commits to move first, but that group will, of necessity, want to limit the extent of their long-term commitment till they are confident others will also join the effort. Only through staged confidence building will we encourage countries to commit to the achievement of more ambitious action.

So let me make a few observations on this dilemma in practice.

First, it is inevitable that an effective global response to climate change will be strongly influenced by the actions of a relatively small group of nations, in particular the major developed and developing country emitters.

Australia is one of a group of around 15 nations which account for around 80 per cent of the world's emissions, as well as a very large share of the global population and economic activity. If we are able to craft a way forward that satisfies this group, it is very likely that this approach would also satisfy most other nations.

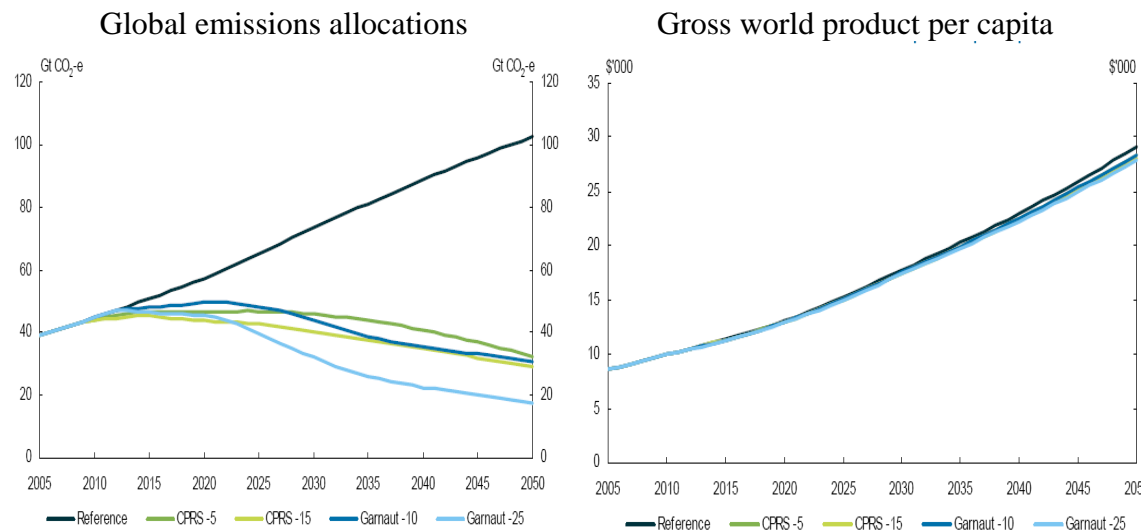
In addition, if some within this group can demonstrate there are low cost ways of dealing with the pollution problem, this can reduce the reluctance of others to enter this cooperative game. Hence, introduction of emissions trading domestically should not be seen as distinct from the international cooperation problem – and international trade in permits facilitated by domestic schemes is another way to build cooperation.

This makes the challenge of reaching an agreement much more tractable, although still challenging.

Second, some of the pessimism expressed appears to reflect a view that climate change is only an environmental issue. In high-income nations environmental issues are often seen as luxury goods, something that you only begin to worry about as income rises. This ignores the fact that many countries are recognising that climate change will impose economic costs and lead to security challenges. Indeed, for many nations, climate change is about security: food security; water security; energy security; and – for some nations – a potential threat to internal and external political security.

Framing climate change as a luxury good also misses the more fundamental point that emissions restraint is consistent with maintaining strong rates of economic growth for both developing and developed countries – a result borne out in the Treasury modelling.

Chart 5: Global emissions allocations and GWP per capita



Note: In the CPRS scenarios, global emissions are not restricted until 2025. Before 2025, global emission allocations are the sum of the allocations to participants and the reference scenario emissions of non-participants.

Source: Treasury estimates from GTEM.

Note: Values are US\$ trillion, 2005 PPP weights

Source: Treasury estimates from GTEM

Third, Australia's commitment to addressing climate change in no way implies we are smarter, more altruistic, or more long-sighted than the people of other nations.

Rather, I believe it reflects the emerging recognition of our vulnerability.

Australia's highly variable climate and recent years of drought have made it easier for us to understand our vulnerability to the impacts of climate change, which are expected to be more severe for us than for most other developed nations. And our industrial structure, built on easy access to cheap and plentiful fossil fuels, makes us vulnerable to poorly considered policy responses elsewhere aimed at reducing use of emissions intensive energy sources, goods and services.

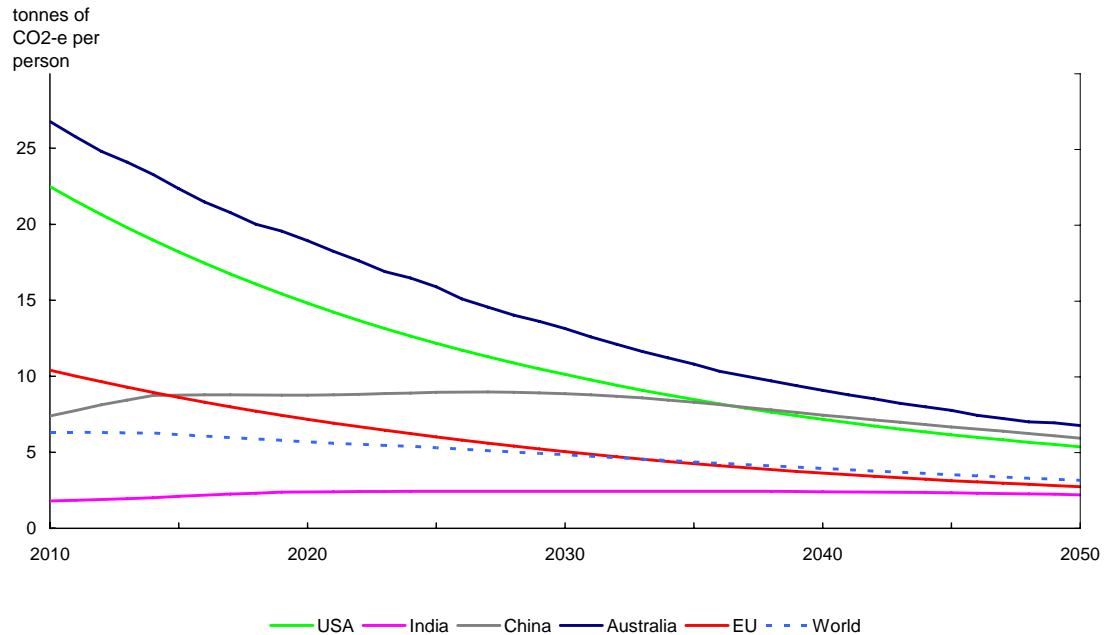
As noted earlier, the Garnaut Report concluded that a fair and effective global agreement leading to stabilisation of atmospheric concentrations at 450 ppm CO₂e or below would be in Australia's interests. Such an objective constitutes a profound challenge to the current tenor of international discussion. The logic and findings of the Garnaut Final Report strongly suggest that global action towards this goal would provide substantial global benefits. This is not a contest between Australia's interests and those of other nations. We all have a shared interest in a sustainable future.

Reflecting the disjunction between these findings and the current state of negotiations, the Garnaut Review also found that it appears unlikely that global commitment to an agreement centred around emissions reductions of this magnitude can be quickly achieved, and the focus should be on action that reduces the risks of dangerous climate change and builds confidence.

So how can Australia contribute to confidence building?

Global agreement will initially require stronger action by the developed nations. This is based on the principle of equity and is reflected in the international treaties Australia has ratified.

Chart 6: Per capita emissions allocations in selected countries under the CPRS-15 scenario

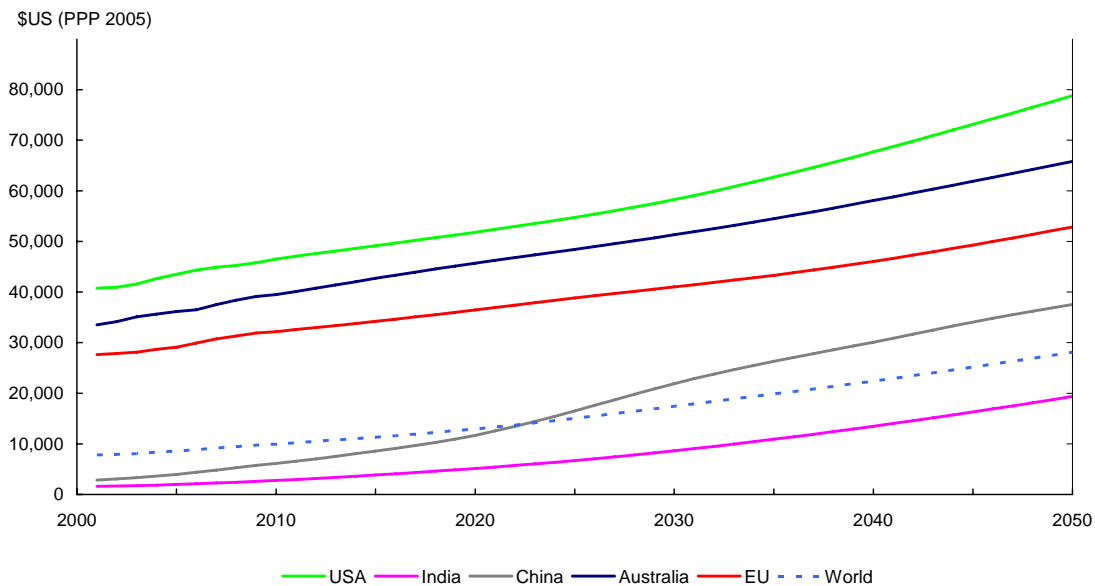


Source: Treasury estimates

Early action by developed countries also recognises the significant divergences in income levels between developed and developing economies. Relatively higher income levels in developed countries imply that these countries will be in a stronger position to implement emissions reductions policies, as they will have relatively more resources at their disposal. Any viable global solution to climate change must support the aspirations of developing countries to continue to raise their standards of living towards those of our own.

Not only do we need to take early action to contribute to confidence building, it plays into our national interest if it helps us to shape the emerging carbon market. While we have to be realistic about our influence on the big decisions such as global emissions reduction targets, a middle power can play a key role in designing the mechanics of the international system. The more you are actively engaged in designing and successfully operating these mechanisms, the more you will have to offer in these discussions.

Chart 7: Per capita income in selected countries under the CPRS-15 scenario



Source: Treasury estimates

Taken together, these strike me as strong reasons for Australia to take on balanced emissions reduction targets now and to introduce an emissions trading scheme capable of delivering these targets at least cost to the Australian economy.

Some claim, however, that it is irrational for Australia to move first.

The Treasury modelling provides compelling evidence that if the world is eventually going to act, there are real benefits to acting early.

Arguing Australia should not act is therefore tantamount to saying the world will not act in its long-term collective interest. That is a counsel of despair, not a basis on which to craft rational Australian public policy.

And in fact, that response is already underway.

Some 27 countries in Europe – both in the European Union and non-EU countries such as Iceland and Norway – are already engaged in emissions trading. Japan is discussing the introduction of a full-scale domestic scheme, following earlier trials of voluntary schemes. Similar discussions are underway in Korea and Taiwan. The Canadian Federal Government and around 27 US states and Canadian provinces are also working to introduce emissions trading schemes. Even China, while not adopting emissions trading, is making efforts to reduce emissions in some sectors.

Only last week, President-elect Obama reaffirmed his commitment to introduce a cap and trade scheme, to cut US emissions to 1990 levels by 2020 – a cut of around 25 per cent on a per capita basis over this period. He also promised to engage vigorously in international negotiations and to lead the world in a new era of global cooperation on climate change.

Some have also pointed to the current EU debate around the distribution of targets and the extent of auctioning as signs of a weakening commitment to reducing emissions.

Our expectation is that the EU will deliver on its targets. The current debate is important, though, in terms of the future evolution of the EU ETS and in particular how responsibility for action is shared across member states.

Interestingly, the UK has just legislated for a target of 80 per cent below 1990 levels by 2050, with a strong target receiving bipartisan support. The new New Zealand Government indicated it was committed to proceeding with a scheme following review in 2009.

To sum up, while no-one can guarantee the emergence of a global agreement, arguing that Australia should wait to see what emerges before committing to action will reduce the probability of an effective global response, risks leaving us to play catch-up.

* * *

In conclusion, Australian action now to implement a CPRS provides a prudent contribution to the achievement of a global response and would assist in addressing our twin vulnerabilities to the impacts of climate change and to poorly conceived policy elsewhere.

The challenge is to get the design right, to set an appropriate trajectory and to use our domestic actions to enhance, not reduce, the prospects for effective global action.