# CHAPTER 7: KEY FINDINGS AND FUTURE ANALYSIS

## Key points

Australia's economy is well placed to respond to market-based mitigation policies.

With efficient policy settings, Australia can achieve its emission reduction objectives and maintain robust economic growth.

Real household incomes continue to grow with emission pricing. Households will face higher prices for emission-intensive products, however, the Government is committed to helping households adjust to Australia's low-pollution future.

Strong coordinated global action reduces the economic cost of achieving environmental objectives, reduces distortions in trade-exposed sectors, and provides insurance against climate change uncertainty. Where emission pricing gradually expands across the world, there are advantages to being an early mover.

If Australia prices emissions before its competitors do, some emission-intensive trade-exposed sectors could lose some competitiveness. Allocation of some free permits, as proposed by the Government, eases their transition. Fears of carbon leakage may be overplayed.

Accurately predicting which mitigation opportunities will prove most cost effective is impossible. Instead, broadly-based market-oriented policies, such as emissions trading, allow the market to respond as new information becomes available.

Australia's economy will respond to the emission price by restructuring. Most sectors will grow. Firms in a few industries face lower levels of output, and the consequent structural adjustment will require careful management.

This report has not found evidence that pricing emissions will compromise Australia's future energy security.

A key challenge for future economic analysis of climate change policies is to develop methods, models and capacity to allow more integrated analysis of the costs and benefits.

This report examines the macroeconomic, sectoral and distributional costs of climate change mitigation policies for the Australian economy. Economic modelling provides insights on the scale of the global effort and consequent economic transformation required to reduce the risks of dangerous climate change.

This study's rigorous analytical approach links global, national, sectoral and household models to generate consistent and integrated projections of economic activity and greenhouse gas emissions. The work done in preparing this report will improve the quality of future analysis, both within and outside government.

Some important gaps exist in Australia's current analytical tools and capacities. The Government plans to develop new tools to complement the existing suite of economic models, and strengthen Australia's analytical capacity to support ongoing international negotiations and implementation of domestic policies.

This chapter summarises the principal findings of the report and identifies priorities for future analysis.

## 7.1 PRINCIPAL FINDINGS

The world and Australia can significantly reduce the risks of dangerous climate change and maintain robust economic growth.

They can do this by introducing efficient mitigation policies which price emissions. Mitigation costs fall as the policy coverage expands. If all sources of emissions across the globe are included, mitigation costs are minimised. This involves participation by all regions and all sectors to reduce emissions of all greenhouse gases.

Stabilising greenhouse gases at low concentrations requires global action: stabilisation at any level is not possible without mitigation action across all major emitters. If the world acts now, using efficient policy frameworks, it could achieve even low stabilisation levels at relatively low cost. Early strong global action keeps open the option of pursuing more ambitious stabilisation levels in the future, if that proves desirable, and provides insurance against the risks of serious and irreversible climate change.

Delaying action increases the risks and costs of achieving any given environmental goal.

The insurance value of pursuing very low global stabilisation targets (450 ppm and below) and strong united global mitigation action warrants further analysis (Garnaut, 2008). This issue is critical to current global climate change discussions, including negotiations on the post-2012 mitigation framework.

### 7.1.1 Implications for Australia in the global context

Australia's aggregate mitigation costs (as a share of GNP) are likely to be higher than the major developed economies, due to its large share of emission- and energy-intensive industries. The global mitigation policy framework therefore will be an important factor in the costs Australia faces.

A broader and deeper international emission market will help minimise the cost of achieving Australia's emission reduction goals, by creating access to lower cost mitigation opportunities in other regions, and minimising distortions associated with trade-exposed industries.

Full participation in international emissions trading would minimise the additional costs associated with more stringent national emission trajectories; strong links between Australia's Carbon Pollution Reduction Scheme and other robust, credible emission markets are crucial.

Comparisons of national emission reduction commitments for the post-2012 period must account for differences in the cost impacts across Annex B regions.[1] Australia, Canada and Russia will likely face higher aggregate economic costs than the United States, the European Union and Japan. Differentiation of national commitments could help offset these cost differences to some extent.

Assuming that global action is eventually forthcoming, economies introducing emission pricing early gain an advantage over the long term, and those that delay face higher costs later. Early action, including by developing economies, is clearly consistent with continued economic development: even for low stabilisation levels, all regions maintain economic growth.

Early mitigation action could ensure economic development supports prospects for long-term growth. For developing economies, delaying obligations could be a costly way to differentiate responsibilities, as delays could encourage further build-up of emission-intensive capital stock that later becomes a significant liability. Early action allows individuals and firms to plan their adjustment pathways and better manage changes in skills acquisition and capital stocks.

The relative costs of different international policy frameworks are crucial to current international negotiations and warrant further analysis.

### 7.1.2 National and trade implications

Economic reforms in Australia over the past three decades have created a flexible and adaptable economy, making it well placed to respond to price-based policies, such as the Carbon Pollution Reduction Scheme, and make the transition to a low-pollution future.

With efficient policy settings, Australia can achieve its emission reduction objectives and maintain robust economic growth. Efficient policies have broad coverage of emission sources and sinks, link to international permit markets, do not limit banking of permits for future use, and provide clear signals regarding future emission reduction targets.

Trade in permits is more efficient than achieving all required emission reductions domestically, as it allows mitigation to occur wherever it is cheapest. Trade does not compromise the environmental objective because Australia's 'excess' emissions are offset by lower emissions in economies that export permits.

Australia's comparative advantage will change in a low-emission world. Australia is likely to retain or improve competitiveness in some energy- and emission-intensive sectors, such as iron and steel, coal and livestock. Australia's competitiveness is likely to decline in other sectors where Australian production is relatively more emission-intensive than its competitors. Modelling suggests this is true for sectors such as aluminium and petroleum refining.

If Australia prices emissions before its competitors do, some emission-intensive trade-exposed sectors could lose some of their competitiveness. However, the results suggest fears of carbon leakage may be overplayed. The report finds little evidence of leakage at emission prices corresponding to all but the most stringent stabilisation goal examined.

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1 Annex B of the Kyoto Protocol lists countries with quantified emission reduction commitments ('Kyoto targets'), and includes the members of the OECD and economies in transition (Russia and other eastern European nations).

The shielding arrangements proposed for emission-intensive trade-exposed sectors in the *Carbon Pollution Reduction Scheme Green Paper* could help ease the transition to a low-emission economy, and assist affected industries with the required structural adjustment.

Overall, shielding redistributes costs from shielded to unshielded sectors of the economy and amongst shielded sectors. The scale of costs will depend on the specific policy design. Maintaining clear mitigation incentives for shielded sectors is crucial. If the level of shielding is increased, or eligible sectors expanded, this would increase costs.

The costs associated with shielding highlight the importance of establishing an effective global mitigation framework. Broad participation in international emissions trading, sectoral agreements or equivalent measures could reduce competitiveness distortions stemming from national mitigation policies.

Slower growth in world demand for energy commodities, especially coal, will lower Australia's terms of trade. In response, the exchange rate (which acts as a buffer to changes in world demand) would be expected to depreciate, thereby helping to maintain the international competitiveness of many other export-oriented and import-competing industries, particularly manufacturing.

This report details possible structures of a low-emission Australian economy. The models approximate the short-term constraints in the real world economy, and cannot provide specific details of the transitional process in all sectors. Further analysis, focused on the short-term implications of mitigation policy, would complement this report.

The scenarios focus on market-based policies that price emissions. This approach helps isolate the effects of different emission reduction trajectories on the Australian economy. This report does not examine the role of policies such as support for research and development into low-emission technologies, and energy-efficiency standards. Where these policies tackle other market failures, such as the public good value of innovation, asymmetric information and split incentives, they could reduce the cost of achieving Australia's emission reduction objectives.

### 7.1.3 Other implications for sectoral activity

Opportunities to reduce greenhouse gas emissions exist in all sectors of the Australian economy.

The mix of mitigation activity (exactly how much occurs where, and when) is uncertain. An accurate prediction of what sectoral mix of changes in supply and demand will be the most cost-effective route to a low-pollution future is impossible. This underscores the importance of policies that create incentives for mitigation across all sectors without mandating where that mitigation occurs.

Pricing emissions will generate different costs and benefits across different sectors.

Firms in a few industries face lower levels of output compared with current levels. The consequent structural adjustment will require careful management of asset closures, worker retraining and regional planning. The Government is committed to providing additional support to assist affected workers and regions where required (DCC, 2008).

Electricity and transport together account for almost half of Australia's current emissions; by switching to more energy-efficient and low-emission technologies, they could reduce emissions substantially in coming decades. Further analysis of the short-term implications for the electricity supply industry is warranted. The Council of Australian Governments has asked the Ministerial Council on Energy to consider key energy sector issues raised by the Carbon Pollution Reduction Scheme.

Australia's low-emission electricity generation technology options and prospects include renewables (geothermal, wind, solar and wave) and carbon capture and storage. Consequently, the electricity generation sector should achieve large emission reductions over time, even if some technologies being explored do not prove commercially viable. This report has not found evidence that pricing emissions will compromise Australia's future energy security.

The future cost, performance and timing of carbon capture and storage will affect Australia's coal industry and coal-producing regions. Australia's aggregate mitigation costs will be lower if carbon capture and storage proves commercially viable, as this will help sustain global demand for coal, and therefore, the value of Australia's extensive coal deposits.

Strong, credible and long-term mitigation policy frameworks are likely to stimulate research, development and deployment of low-emission technologies, and help reduce future mitigation costs. Future emission price expectations, and therefore policy credibility, are crucial.

### 7.1.4 Implications for households

The initial impact on households will be through increases in electricity and gas prices. The CPRS scenarios show a one-off rise in the consumer price index (CPI) of 1-1.5 per cent. Price impacts on petrol and meat products will be deferred until later years through the effect of the fuel tax offset and initial exclusion of agriculture from the scheme. While the price impact of the scheme is estimated to be relatively larger for low-income households, these impacts will be offset by the Government's commitment to help households adjust.

Electricity and gas together account for a small proportion of household spending, and so, despite the price rise, will have only a small effect on overall household consumption. Over time, real household incomes continue to rise strongly.

## 7.2 CONCLUSION

This report brought together many of Australia's leading climate change economists to comprehensively analyse the potential effects of mitigation policies on the Australian economy. It rigorously examines and assesses the implications of policies to reduce greenhouse gas emissions for the Australian economy. The report is a key input to Government decisions regarding Australia's future emission pathway, and Australia's role in an effective global response to climate change.

This is a complex policy area, and the Government is drawing on many sources of advice and will consider the full range of costs and benefits of mitigation policy. The Government will consider public responses to this report before it makes its decision on Australia's emission targets for the medium term.

This report forms part of a much wider body of work on the economic impacts of climate change. This report looks only at the costs of mitigation, not the benefits. A critical challenge for future analysis is to develop methods, models and capacity that will allow a more integrated analysis of these costs and benefits.

Climate change analysis will remain a policy priority, informed by ongoing scientific and economic developments and the evolving international policy landscape.

## 7.3 REFERENCES

Department of Climate Change, 2008. *Carbon Pollution Reduction Scheme Green Paper*. Australian Government, Canberra.

Garnaut, R., 2008. *Garnaut Climate Change Review Final Report*, Cambridge University Press, Port Melbourne.