STRATEGIC REVIEW OF

Australian Government Climate Change Programs

31 JULY 2008

MR ROGER WILKINS AO

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ISBN 1 921182 93 8

Department of Finance and Deregulation
Financial Management Group

The Hon Lindsay Tanner MP
Minister for Finance and Deregulation
Parliament House
CANBERRA ACT 2600

Dear Minister

Strategic Review of Australian Government Climate Change Programs

I present you with the report of the Strategic Review of Australian Government Climate Change Programs. Thank you for the opportunity to lead this review.

The issue of how to frame future policies to complement an emissions trading scheme is a crucial one. Bad policy could undermine the efficiency and credibility of the scheme, and be very costly to the Budget and the Australian economy.

The Report makes findings and recommendations not only about existing programs and policies but also future policies. It suggests a framework for formulating and assessing future policy. I hope the Government will find this useful.

In preparing the report, we took into account the views of a variety of stakeholders, including 56 written submissions from interested parties. These ranged from industry groups, small and large companies and individual citizens. We also had a large number of face-to-face meetings and discussions.

The directions, findings and recommendations of the report are my responsibility. But, I would also like to acknowledge the professionalism, diligence, analytical and entrepreneurial skills of the officials who have assisted me in researching and writing this report. I have greatly benefited from their hard work and frank advice; and I have enjoyed working with them.

Thank you again for the opportunity.

Yours sincerely

Roger Wilkins AO

31 July 2008

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EXECUTIVE SUMMARY

If there were a broad-based perfectly functioning emissions trading scheme in Australia, there would be no need for any complementary policies. The trading scheme would deliver the most efficient outcome for Australia.

But markets do not work perfectly. There are issues that need to be addressed during the transitional period of setting up a market. And, most importantly, markets do not deliver equity. They deliver efficiency.

Government should only retain or adopt policies to reduce carbon emissions if it can be demonstrated that they address some inefficiency in the way the emissions trading scheme is working

Chapter 1 of the Report sets out principles that should govern the Government's deliberations about what complementary policies to adopt. The main idea is that the Government should only retain or adopt policies to reduce carbon emissions if it can be demonstrated that they address some inefficiency in the way the emissions trading scheme is working.

We also recommend that the Government develop and use a method of looking to the price of carbon implicit in a policy measure or regulation and asking 'Is this implicit price of carbon for this proposal lower than the price carbon is trading for in the market?'

Only if the price of the policy is lower than or equal to the market price is there a case for proceeding. This is a key discipline for framing future policy in this area.

Indeed, the main complementary policy in our view is having a sensible set of principles to enable Government to decide on complementary policies for the future. That is very important in order to indicate to the market that the Government will not interfere with or intrude into the market by framing policies that distort prices or change or amend the rules, except in circumstances and in a manner clearly set out at the inception of the market.

This sort of discipline is necessary to create the confidence and certainty that will enable the market to work efficiently.

Suite of 62 programs should be transitioned to 8 programs that are more strategic, better aligned and with sufficient funding to achieve their objectives

Chapter 2 reviews existing government programs. We tested the programs against the principles and classified them into those that are complementary, those that are not, those that are transitional and those that could be changed or reconfigured.

Our fundamental conclusions were that there are too many programs. Many are ad hoc or badly targeted. There is no framework or logic that could be said to organise or render these a coherent set of policies.

They are pretty clearly the result of multiple decisions made in an environment where there was no clear strategic approach to policy. Certainly no clear commitment to least cost mitigation or a commitment to use markets to arrive at the most efficient outcome.

Use the 2009–10 Budget process to start streamlining programs and reallocate funding

But we do not recommend a simple 'cleaning of the slate'. Rather, we recommend that the Government use the next few budgets to transition this rather disorganised set of programs, most of which it has inherited. They should be transitioned from 62 to eight programs that are more strategic, better aligned with the emissions trading scheme and government priorities, and with sufficient funding to achieve their objectives.

Most importantly the eight programs are genuinely complementary to the emissions trading scheme.

The eight programs we have suggested are as follows:

- education and information – Australia's Low Carbon Future Program;
- technology – Carbon Technology Trust;
- transition for business – Climate Change Action Fund;
- industry development – Electricity Sector Adjustment Scheme;
- energy efficiency – National Energy Efficiency Program;
- international – Climate Change International Program;
- adaptation – Climate Change Adaptation Program; and
- science – Climate Change Science Program.

They are set out in greater detail in Appendix 4 of Chapter 2.

Chapters 3 to 10 discuss the types of policies that could improve the efficiency of an emissions trading scheme. Chapters 4 and 5 deal with areas on the 'demand side' of the carbon market where there may be a need for complementary policies – information and energy efficiency. Chapter 6 deals with the 'supply side' of the market and possible market failures in research and development (R&D) and getting innovative technologies into the market. Chapters 7 and 8 deal with other markets such as the energy market and the transport market, where there are inefficiencies that are likely to prevent the emissions trading scheme from delivering least cost greenhouse gas emission reductions.

Single level of government and single department should be responsible for greenhouse gas mitigation policy

Chapter 3 recommends institutional changes that are important to ensure that into the future the emissions trading scheme continues to work efficiently, and governments (including State and Territory governments) do not interfere deliberately or inadvertently with the market.

Currently, there are in excess of 200 relevant programs around Australia in the States and Territories. Many have the potential to interfere with an emissions trading scheme. The States and Territories, over a decade, filled the policy vacuum left by the Commonwealth Government.

There is now a need for the Commonwealth to resume leadership over this area of policy (which it is doing) and the States and Territories to withdraw from it (which they are doing). But we think this needs to be accelerated and formalised. Why? Because a formal compact between all levels of government

Need for formal high level agreement between governments on roles and responsibilities. Commonwealth should lead on mitigation and the States on adaptation

(that is, COAG) will send the right message to the markets that no government is going to interfere with or distort the market. This is important for confidence in and the credibility of the market.

Within the Commonwealth, responsibility for climate change programs are split between a number of departments. Given the prominence and the importance of the issue of climate change, we are recommending that a single department, the Department of Climate Change, take responsibility for existing and new climate change programs.

We also recommend that the Government impose the discipline on itself and its officials of assessing its policy proposals for their carbon impacts. It is not always going to be obvious where and what impacts there might be. For instance, in infrastructure planning, building a dedicated freight track through Sydney could reduce carbon emissions by enabling greater carriage of freight by train.

We have also suggested institutional arrangements to ensure that the Ministers and the Department for Climate Change are 'at the table' when policies that might impact on carbon reduction or adaptation are developed or discussed. It is not that carbon considerations should always be 'trumps'. But they do need to be heard and considered in the policy process.

Need well-informed community and market participants if the emissions trading scheme is to work efficiently

Chapter 4 deals with the very important topic of information. It is impossible to underestimate the importance of a well-informed community and market participants if the emissions trading scheme is to work efficiently.

People want to know and need to know what this new market is, how it will affect them, and what they can do about it. There are many ways in which they will get information – the media, education institutions, professionals of various sorts, producers of goods and services. The Government too needs to be a provider of information. But this needs to be done strategically, at different levels, for different groups, and for different purposes.

Government also needs to ensure that people are not misled. Institutions such as Australian Competition and Consumer Commission and State and Territory consumer protection agencies need to be vigilant and resourced.

Setting standards, mandatory or voluntary, and the disclosure of performance for goods and services is vital to a well functioning market. Governments already do this for some goods such as cars, white goods and new houses. This use of standards and disclosure can be a useful way of complementing the market and overcoming high transaction costs. But Governments need to be careful to properly assess the costs and benefits of prescribing standards and proscribing goods. This could simply raise economic costs and remove choice without adding to the reduction of carbon.

Coordinated national approach to energy efficiency

Chapter 5 deals with energy efficiency. Energy efficiency saves both carbon emissions and money. As the price of carbon rises there will be greater incentives for households and businesses to take up energy efficiency opportunities. Very often energy costs are a relatively small component of

overall budgets and households and businesses tend to be slow in taking them up because it is a 'hassle'. And because most often you will need to invest capital up front to make savings over time and capital is not always available.

Governments can help this process by providing and encouraging the provision of better information. We think the Government should also consider using the tax system to assist businesses and households make targeted capital investments and changes to their way of doing business that would reduce emissions. This would fit with the Government's stated intention to recycle revenue from auctioning carbon permits.

But we should always bear in mind that there are savings to be made here. And there are signs that retailers of energy, financiers, producers of goods and services, energy services companies, are beginning to develop cost effective ways of retrofitting buildings, businesses and factories. Governments need to be careful not to force households and businesses to do things that may ultimately prove to be inefficient or high cost.

All levels of government, and governments overseas as well, are becoming active and interventionist in this area of policy. There is a real danger of duplication, overlap and high costs through unavoidable and uncoordinated intervention. We think that it is very important for COAG to initiate a coordinated national approach to energy efficiency.

For lower income households, there is likely to be a more severe impact from higher energy prices and less capacity to do something about it. A properly coordinated approach across the Commonwealth, States and probably local government and non-government organisations to deal with this issue is important and legitimate. We make some suggestions about how this might be done.

Need for more streamlined and commercial approach to technology development

Chapter 6 deals with technology. We think there is a need for complementary policies to do two things. One is to support R&D into new low emissions technology. The other is to assist new technology to get into the market. Not to 'pick winners' or widely deploy technology, but to help overcome the difficulties and barriers that 'first movers' often encounter. We do not think that Government should mandate or subsidise the wide deployment of technology. That would undermine the carbon market and would either be more costly mitigation or unnecessary expenditure.

- A strong and credible carbon price signal will decrease the need over time for support for technology development.

We think the Government should consider setting up a Carbon Technology Trust to use the various funds the Government has identified to bring new technology to market.

The advantages of such a vehicle would include:

- it would not be overly bureaucratic and would be operated by people who understand finance and venture capital;

- it would be able to take a disciplined look at developing a portfolio of technologies across all sectors of the economy. It would consider where Australia is leading the way and where international cooperation might make sense;
- it would operate within broad directions given by the Government, but relieve Ministers of the need to decide where and what funds should be used for;
- it could advise Government in a very specific and practical way of any market failures or market barriers that need to be addressed; and
- it would have the capacity to leverage private sector finance and to enter into arrangements about how intellectual property might be deployed. This is not to say it should 'own' intellectual property, but the Government does have an interest in wider use of successful technologies and arrangements need to ensure that that interest is safeguarded.

Carbon capture and storage is important for Australia's exports

The coal industry is very important for Australia's economy. ABARE modelling shows that an international agreement to reduce carbon would have a significant effect on Australia's economy by curtailing coal exports[1]. Carbon capture and storage (CCS) technology is, therefore, very important to Australia's economy.

Commercial scale CCS is likely to be an expensive project, and we argue that the Government should commit serious and substantial funding to demonstrating CCS (preferably with black coal given that this is Australia's major export.) So too should the coal industry. The current funds are nowhere near enough for the sort of commercial scale demonstration required.

Chapters 7 and 8 deal with energy markets and other markets that are likely to have a significant impact on the effectiveness of the emissions trading regime. We think that tax policy is very important. First, because there are a variety of perverse incentives that actually encourage the emission of carbon; and, second, because tax rebates or concessions represent a more generic, efficient and technology-neutral manner of recycling revenue obtained through auctioning permits. We think these issues need to be considered by the Australia's Future Tax System Review.

Energy and transport market reform are critical for carbon reduction

We also recommend that COAG accelerate microeconomic reform in energy and transport markets. The deployment of low emissions generation and modes of transport are going to be highly dependent on features of those markets. Especially price and how transparently price reflects the costs of transmission, road usage for example. Reforms in these areas of the economy could have as great an effect on the reduction of emissions as a emissions trading scheme. As well as that, they will improve productivity and efficiency of the economy. A 'win-win.'

1 ABARE, 2006

Because of the sheer complexity and variety of issues in the areas of adaptation and science, having well designed systems for coordination, cooperation, and exchange of information is critical

Chapter 9 deals with adaptation to the impacts of climate change and science. What we know from the state of the science is that it is likely that Australia will need to adapt to impacts of climate change. Notwithstanding action to mitigate or reduce carbon, some climate change impacts are occurring or a very likely to occur. Changes in weather and rainfall patterns, more severe storm events, for example.

The issue (or issues) of adaptation are likely to be more difficult to identify and work out than the problem of reduction. Adaptation issues will not necessarily neatly present themselves with a label 'adaptation' written on them. Arguably, the recent Murray–Darling Agreement is the best example of good adaptation policy. And this was a very complex arrangement that dealt with a whole range of issues.

An objective observer would say that currently governments are spending too much time, energy and resources on reduction and not enough on adaptation. There is an argument that the Commonwealth, by and large, should deal with the issue of carbon reduction. The centrepiece of that is the emissions trading scheme. States and local government, should turn more attention to issues of adaptation – many of these climate change impacts are going to be local and regional in character.

We recommend that COAG continue work already underway under the National Adaptation Framework with two suggested improvements.

First, there should be a better coordinated agenda for scientific research. This comes out of a review that the Commonwealth commissioned by Dr Susan Solomon and Professor Will Steffan.

Second, COAG needs a panel or group of experts that can give it, and the community, a view of what the important problems of adaptation are and what options might be sensible to deal with those problems. This requires the sort of skills and expertise that insurers use in identifying and costing risks and assessing the impact on the costs of various possible solutions and interventions. The danger for governments is that they might end up spending large amounts of money adapting on account of a low cost risk. Or they might not be dealing with the highest cost risks.

There are a huge variety of challenges and opportunities that may be issues of adaptation – anything from water to health to insurance to infrastructure. There is also likely to be a lot of local variations: different geography, vegetation, demography, and weather patterns.

Because of the sheer complexity and variety of issues in this area, having well designed systems for coordination, cooperation, and exchange of information is critical. A grand detailed plan for adaptation policy in Australia is probably neither possible nor desirable, except at the most general and schematic level.

It is also critical that government and the community not assume that adaptation will always be something government will fix up. In some cases,

funds may be necessary. In other cases, government intervention may be more minimal, such as adjusting building standards, for example or zoning of land. In other cases, it may simply be a matter of ensuring that people are well informed and make their own choices.

What happens at an international level is critical to the solution of climate change. The wider and deeper the market, the more efficient it will be

Chapter 10 deals with international issues. What happens at an international level is critical to resolving climate change. Without international action, there will not be a sustainable global solution to the problem of climate change.

The shape of international efforts or agreements to combat climate change will have a significant impact on the costs of reduction for Australia. If other countries and regions embrace market solutions, this could significantly lower the costs of reduction. The wider and deeper the market, the more efficient it will be.

Emissions trading is potentially a vehicle for bringing developing countries into a climate change agreement and for enabling them to develop more rapidly with low carbon technology. The Clean Development Mechanism is an example of how that could work.

Australia's capacity to prosecute the case through multilateral and bilateral negotiations is, therefore, very important to the efficiency of Australia's emissions trading scheme.

It is also evident that there are low cost options for carbon reduction in developing countries. In many cases, these options also open up the opportunity to assist development in those countries and to promote Australia's relationship with those countries for other purposes.

Confidence and certainty about the carbon market is the key to efficient carbon reduction

Chapter 11 sums up by pointing to important future directions. The two single most important things to come out of our review are these:

First, dealing with climate change is a long term issue, it is a long haul. The programs we have in place will shift and change over time. But central to sorting out the problem is not allowing those policies and programs to undermine, interfere or distort the carbon market. Confidence and certainty about that market is the key to efficient carbon reduction.

The point of emissions trading scheme is not to raise revenue but to change relative prices and create an incentive for that transformation to occur

Second, over time climate change will require a transformation of the Australian economy, indeed the world economy. It is really a change to a more sustainable way of living and doing business. But this transformation will require capital investment over time.

We think that the Government needs to consider recycling revenue from auctioning in such a way as to encourage that transformation to occur. After all, as the Government has made clear, the point of an emissions trading scheme is not to raise revenue but to change relative prices and create an incentive for that transformation to occur.

An overview of the Review's recommendations follows.

Strategic Review of Climate Change Programs
July 2008

RECOMMENDATIONS

The Review has made 30 recommendations, as follows.

Recommendation 1

The Government should adopt the 'principles for complementary policies' as its framework for deciding whether its policies (either existing or proposed in the future) will help or hinder the work of an emissions trading scheme (ETS).

- ***Principle 1**: The Government should rely on the ETS to achieve least cost abatement and only take action in addition to the scheme where there is a demonstrable and compelling case that the market is not working efficiently and that government action will not distort or undermine the scheme.*
- ***Principle 2**: The Government's key role in adaptation should be to facilitate informed decision making across the economy.*
- ***Principle 3**: The Government should take into account the potential for its non-climate change policies to compromise or enhance the ability of the ETS to achieve least cost abatement.*
- ***Principle 4**: The Commonwealth should be primarily responsible for mitigation policy and all jurisdictions should contribute to a nationally coordinated approach to adaptation.*
- ***Principle 5**: As in all areas of policy, climate change measures should conform to best practice policy design, including the need for an evidence-based assessment of options and rigorous evaluation.*

Recommendation 2.1

The Government should use the 2009–10 Budget process (or earlier if inclined) to begin to rationalise and streamline its existing suite of climate change programs, including its recent government commitments, by adopting the Review's findings and recommendations as outlined at Appendix 4 to the Report.

These findings and actions can be summarised as requiring the Government to:

- *terminate or phase out programs assessed as not complementary to an ETS (16 programs);*
- *continue (including amend) transitional programs until the ETS is fully functional (15 programs);*
- *amend programs that could be redesigned to be complementary to an ETS (22 programs); and*
- *continue programs that are considered complementary to an ETS (9 programs).*

Recommendation 2.2

In rationalising and streamlining its existing suite of climate change programs in accordance with the Review's findings and recommendations, the Government should also seek to:

- *consolidate its expenditure to focus on fewer, better targeted, programs; and*
- *ensure that all programs and sub-programs have clear and measureable performance management information and risk management strategies.*

Recommendation 2.3

The Government should commit to a further Review of its climate change programs in 2011 with its recommendations to be considered in the 2012-13 Budget process.

Recommendation 3.1

The Commonwealth Government should seek the agreement of State and Territory governments to a National Climate Change Compact to clarify roles and responsibilities that would include:

- *a statement acknowledging the challenge that climate change represents for Australia and the world and the importance of a nationally coordinated approach;*
- *agreement that the Commonwealth will be responsible for:*
  - *establishing and maintaining the ETS and any associated schemes, including the national expanded Renewable Energy Target;*
  - *establishing any complementary mitigation measures and ensuring such measures conform, in general terms, with the principles for complementary policies; and*
  - *a single, national scheme for the reporting of emissions.*
- *a commitment by States and Territories to withdraw from policies or programs with the potential to undermine the ETS.*
- *a renewed commitment by all jurisdictions to progress the Council of Australian Government (COAG) National Adaptation Framework and develop a national science agenda.*
- *a national approach to energy efficiency and low emissions technology development.*
- *a commitment to expedite progress on national reform priorities which are necessary to underpin the effectiveness of the ETS, such as the reform of national energy, transport and water markets.*

Attachment 3.B outlines a suggested approach to the Compact.

Recommendation 3.2

The Government should consider centralising responsibility for developing, coordinating and implementing its climate change policies and programs and advising the Government on the climate change implications of other policy decisions in one department – the Department of Climate Change.

Recommendation 3.3

The Departments of Prime Minister and Cabinet and Climate Change should develop a mechanism for ensuring that Cabinet is informed of the potential for policy proposals to impact on the ETS, and that any such impacts are sufficiently taken into account in the policy development and decision making process.

Recommendation 3.4

The Department of Climate Change should develop a methodology for estimating the carbon abatement cost implicit in new climate change policy proposals, to inform consideration of their relative merits.

Recommendation 3.5

The Commonwealth should apply the Energy Efficiency Opportunities framework to its own operations, and encourage State and Territory governments to adopt a similar approach.

Recommendation 4.1

The Government should undertake a range of strategic actions to inform different sections of the public and the markets about climate change and the ETS. This would support:

- *managing expectations about the nature of the challenge which climate change represents for Australia, and about the impact of an ETS on the economy and community;*
- *build greater understanding of the roles and responsibilities of different levels of government;*
- *explain what individuals can do to meet the challenge; and*
- *ensure information is provided to ETS participants and others on what to expect from it.*

Recommendation 4.2

The Government should ensure that existing consumer protection infrastructure is ready to manage any issues that may arise from the ETS, such as false or misleading advertising or price gouging.

Recommendation 4.3

The Government will continue to have a role in setting and disclosing performance standards in relation to:

- *buildings (outcome standards);*
- *fuel and vehicle standards (minimum performance); and*
- *energy use in appliances and other products (minimum performance);*

but should only do so where a robust cost benefit analysis indicates that there is a net benefit to the economy from doing so. The presumption should be to adopt international standards in the first instance unless there are compelling reasons not to do so.

Recommendation 5.1

The Commonwealth Government must take a leadership role through COAG to develop and implement a national approach to energy efficiency. This would include cooperation and agreement to:

- *coordinate Commonwealth, State and Territory payments to low income households;*
- *improve the energy efficiency of existing and new public housing and community buildings; and*
- *energy market reforms as outlined in Recommendation 7.1.*

Recommendation 5.2

The Commonwealth Government should:

- *continue to require business to comply with the requirements of the Energy Efficiency Opportunities program; and*

- *develop a voluntary energy efficiency program targeted at small and medium size businesses that combines relevant elements of Energy Efficiency Opportunities and Greenhouse Challenge Plus to assist these businesses to improve their energy efficiency.*

Recommendation 5.3

To improve the ability of energy users to better manage their energy consumption following the introduction of the ETS, the Government should consider measures that include:

- *broad-based assistance to facilitate investments by households, in particular low income households, and businesses in energy efficiency improvements;*
- *provision of information and tools to assist households and businesses in identifying energy efficiency opportunities which may include support for widespread energy audits and customised consultations in-situ; and*
- *incorporating and expanding the consideration of energy efficiency into the training and development of professionals in engineering and industrial design as well as ensuring that there is sufficient investment in the training of auditors and professional standards (in partnership with industry associations).*

However, it is important that any such measures would need to be subject to a rigorous cost-benefit analysis of the merits of different approaches and would be instead of, rather than in addition to, existing programs.

Recommendation 6.1

The Government should continue to provide support for early stage research and development into low emissions technologies as part of its general support for a well functioning national innovation system.

Recommendation 6.2

The Government should consider establishing an independent investment vehicle – to be called the Carbon Technology Trust – with an overarching mandate to accelerate Australia's transition to a low carbon economy, by investing in the development and demonstration of a portfolio of technologies across the economy. The Trust would:

- *be subject to high level directions from the Government from time to time (similar to the Future Fund);*
- *be administered by an independent board that comprises experts in the fields of venture capital, finance, technology and public policy;*
- *have flexibility in its approach to contributing to different technology projects and leveraging private sector investment, potentially subject to some benchmarks, in building its technology portfolio;*
- *achieve an appropriate rate of return across its technology portfolio over time;*
- *have sufficient scope to participate in international projects in pursuit of its mandate;*
- *be time limited through a sunset provision; and*
- *act as a source of advice to Government on where there are structural or regulatory barriers to the development and demonstration (and even the deployment) of new technologies.*

Recommendation 6.3

To facilitate the deployment of carbon capture and storage technology, the Commonwealth Government should work through COAG to establish a nationally consistent regulatory system to govern the transport and geological storage of carbon dioxide which should cover, among other things:

- *access and property rights;*
- *arrangements for assigning long-term liability for geological storage of carbon dioxide; and*
- *arrangements to cover the allocation of risk.*

Recommendation 6.4

Given the strategic importance of Australian coal exports, the Government should ensure that commercial scale carbon capture and storage demonstration projects are in operation as soon as possible. This may require a significant increase in funding and work to streamline regulatory approvals.

Recommendation 7.1

The Commonwealth Government, through COAG, should seek the agreement of all States and Territories, as soon as possible, to:

- *transfer all regulatory responsibilities for Australia's energy markets to the Australian Energy Regulator;*
- *accelerate the deregulation of retail electricity pricing to ensure that the price signal provided by the ETS is passed through to electricity consumers;*
- *begin the full rollout of smart meters to electricity consumers in all jurisdictions;*
- *accelerate the reform of electricity network connection and transmission pricing to ensure that they do not form a barrier to the entry into the market of new electricity generation; and*
- *accelerate the reform of the planning and pricing arrangements for distributed generation to recognise the benefits of distributed and embedded generation as an alternative to network augmentation.*

Recommendation 7.2

In proceeding with the implementation of an expanded national Renewable Energy Target, the Government should phase out superseded subsidy and rebate measures that support the renewables industry.

Recommendation 8.1

The Government should recognise that pricing distortions in other markets may prevent least cost mitigation (that is, impede the effective operation of the ETS). Continued pursuit of structural reform and improved efficiency in the economy (including in energy, transport and water markets) will support the achievement of least cost emissions reductions.

Recommendation 8.2

The Government's Australia's Future Tax System Review should consider:

- *options for reforming those aspects of the tax system that act as disincentives for individuals and companies to reduce their greenhouse gas emissions; and*
- *the potential merit of using the tax system to support the investment in new capital, by both businesses and households, that will be incurred over an extended period of time as Australia transitions to a low carbon economy.*

Recommendation 8.3

The Government should recognise that pricing distortions in transport markets may prevent least cost mitigation. Continued pursuit of improved efficiency in the transport sector will assist to achieve least cost emissions reductions.

The Commonwealth should continue to work with the States and Territories through COAG to establish a national approach to regulation, planning and public investment in:

- *freight transport – which should include reforms to road user charges, to facilitate clearer price signals between different modes of transport, and to infrastructure planning and investment to better integrate different modes of transport; and*
- *passenger transport – focussing particularly on the need for investment in public transport infrastructure in urban areas and integrated transport planning.*

Recommendation 8.4

In the lead up to the agriculture sector being covered by the ETS, the Commonwealth should, in cooperation with States and Territories:

- *develop and improve techniques for the measurement and analysis of greenhouse gas emissions; and*
- *undertake a stocktake of rural assistance measures that support greenhouse gas mitigation and adaptation (the National Review of Drought Policy may assist in this regard).*

Recommendation 8.5

Governments should continue the development of a national building code that encompasses nationally consistent standards to improve energy efficiency of buildings, supplemented by rating tools. Building energy efficiency ratings should include disclosure at point of sale or commercial lease.

Recommendation 8.6

Environmental protection and planning laws across all jurisdictions should not require anything more than compliance with the ETS in respect of the emissions associated with projects in sectors covered by the scheme. However, such requirements may be appropriate in respect of uncovered sectors or where entities receive free permits under the scheme.

Recommendation 9.1

The Commonwealth Government should continue to support climate change science and should consider developing and implementing, through COAG, a comprehensive national climate change science agenda.

Recommendation 9.2

To ensure that there is sufficient risk analysis and costing of risks when considering adaptation action, the Commonwealth Government should work through COAG to establish a National Adaptation Advisory Board, to advise COAG on:

- *priorities for adaptation in Australia;*
- *what types of adaptive measures might be cost effective; and*
- *what role, if any, governments need to play in relation to adaptation.*

Recommendation 10.1

The Government must have strong and effective international engagement, which is appropriately resourced, to influence and support international least cost abatement of greenhouse gas emissions.

INTRODUCTION

Summary

The Strategic Review of Australian Government Climate Change Programs (the Review) was commissioned as a source of independent advice to the Australian Government on what measures might complement an emissions trading scheme (ETS) and whether existing climate change programs will have a role once the scheme is in place.

This introduction provides an overview of the background to the Review and its governance arrangements, the context in which it was undertaken and the issues covered in this report.

Background

The Rudd Government has articulated three clear climate change policy priorities:

- reducing Australia's greenhouse gas emissions at least cost (mitigation at least cost);
- adapting to unavoidable climate change (adaptation); and
- helping to shape a global solution (international).

The Government has announced its intention to implement a comprehensive emissions trading scheme (ETS) by 2010 to reduce Australia's greenhouse emissions. The introduction of a national ETS as the principal emissions reduction measure represents a fundamental shift in the way greenhouse gas emissions are managed in Australia.

- On 16 July 2008, the Government released the *Carbon Pollution Reduction Scheme Green Paper* (the Green Paper) that outlines its preferred approach to the design and implementation of the ETS and associated measures.

The ETS will expand both the scope and scale of Australia's abatement task and allow the market to choose where and how reductions in emissions can be most efficiently achieved. This creates both an opportunity, and an imperative, to consider whether existing climate change programs will complement the scheme or undermine it.

Terms of reference

In February 2008, the Australian Government commissioned a strategic review of all existing climate change programs to:

- ensure they are complementary to the ETS;
- phase out less efficient abatement programs and initiatives that will compromise the abatement incentives arising from the carbon price signal provided by the ETS; and
- rationalise duplicative and overlapping programs.

The strategic review process is part of the Government's broader performance and accountability framework. It aims to ensure that programs remain aligned with the Government's policy priorities and that changing priorities can be addressed through reallocating resources.

The Review was tasked with developing a set of principles to assist in assessing whether existing programs are complementary to an ETS, and looking forward, to use in the development and implementation of future climate change measures that are complementary to the scheme.

- It was expected that these principles would include concepts such as whether programs address clear market failures that are likely after the introduction of emissions trading, or which may be necessary to prepare for emissions trading.
- Further, complementary programs were to be considered in their broadest possible context and were also expected to address aspects of Australia's climate change response that are not covered by emissions trading, including equity considerations.

In developing recommendations in respect of existing climate change programs, the Review has also been asked to assess the appropriateness, effectiveness and efficiency of the existing suite of climate change programs. Accordingly, the Review's recommendations will meet the requirements of the second stage of the Review of Government Expenditure, being undertaken within the Department of Finance and Deregulation (Finance).

The Review's full terms of reference are at Appendix 1 to the Report.

Scope

The Review has considered a set of 62 programs, which include programs in place prior to the 2007 federal election and Government commitments implemented in the 2008–09 Budget (Government commitments cover 32 of the 62 programs).

- As at 13 May 2008, climate change programs accounted for $3.75 billion over the forward estimates (2008–09 to 2011–12) and of this amount, just under two thirds, $2.3 billion, was committed in the 2008–09 Budget. A full list of programs is at Appendix 2 of this Report.

At present, at the Commonwealth level, climate change related programs are delivered by at least six departments – the Departments of Resources, Energy and Tourism (DRET), Climate Change (DCC), the Environment, Water, Heritage and the Arts (DEWHA), Innovation, Industry, Science and Research (DIISR), Agriculture, Forestry and Fishing (DAFF), and the Treasury – and four research and other institutions (the CSIRO, Bureau of Meteorology, Australian Research Council (ARC) and one Rural Research and Development Corporation (RDCs)).

Every State and Territory government implements various 'climate change' programs.

Governance

Mr Roger Wilkins AO, Head of Government and Public Sector Group, Australia and New Zealand at Citi, conducted the Review. He was assisted by a team of six officials drawn from Finance, the Treasury, DCC and DRET. The Review Team was located within Finance for the duration of its deliberations.

The Review engaged key agencies through a consultative group of officials chaired by Finance and comprising representatives from the Department of the Prime Minister and Cabinet (PM&C), Treasury, DCC, DEWHA, DIISR, DAFF and DRET. It was also assisted by the Departments of Foreign Affairs and Trade, and Infrastructure, Transport, Regional Development and Local Government.

The Review would like to thank all the above departments for their constructive contribution to the process.

Public consultation

The Review sought public submissions to inform its deliberations. Over 50 submissions were received and considered by the Review. A list of submissions is at Appendix 3.

Key themes from the submissions included the following:

- There was broad support to streamline existing climate change programs across jurisdictions, particularly among businesses that are subject to similar schemes at a Commonwealth and State level.
- The area most frequently cited as requiring support in addition to an ETS was research, development and demonstration activities associated with climate change science and low emissions technology.
- There was general support for the need to assist households on low or fixed incomes in adjusting to the impact of an ETS – both in terms of monetary compensation through the tax and social security system and targeted assistance in relation to energy efficiency.

Where possible, Mr Wilkins and the Review Team also sought to make themselves available for meetings with stakeholders in relation to the Review. Through these meetings and the submissions process, the Review was able to access a wide range of views and perspectives which have provided valuable input to its deliberations.

The Review would like to thank all those individuals, businesses and representative groups who took the time to participate in this process.

Other reviews

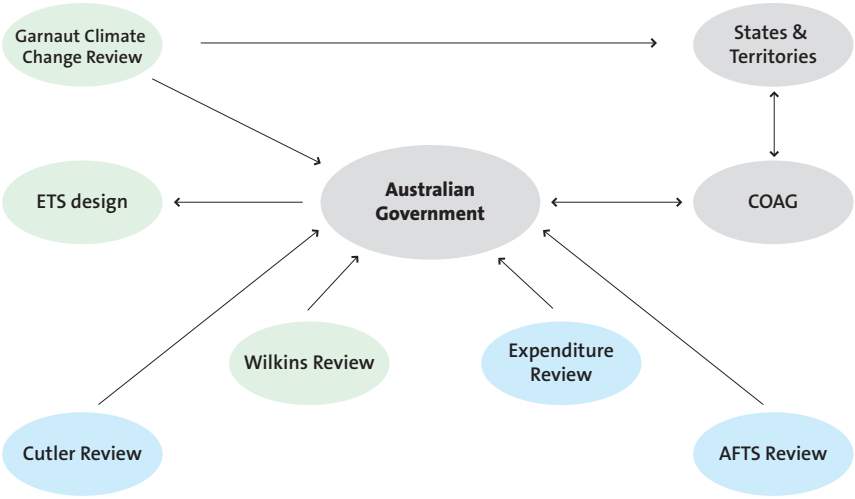
There are a range of other reviews and policy development processes that are relevant to the issues considered by this Review. The significant ones are:

- the work being undertaken by the Garnaut Climate Change Review;
- the ETS design process being led by DCC; and
- the work of the Council of Australian Governments (COAG) Working Group on Climate Change and Water on streamlining climate change programs across jurisdictions.

In addition, recommendations from the Review of the National Innovation System (the Cutler Review), the Government's Australia's Future Tax System (the AFTS Review) and the National Review of Drought Policy (Drought Review) will have implications for government programs in the climate change area.

Figure 1 below attempts to demonstrate where the Review fits within these other activities.

Figure 1: Concurrent reviews and policy development processes



As part of its work, the COAG Working Group's Sub-Group on Complementary Measures is developing a set of principles for complementary measures. While those principles are yet to be formally approved by COAG and made public, the Review understands that they are broadly consistent with the principles it has developed.

- Both sets of principles are primarily concerned with market failures that may impinge on the effectiveness of the ETS and how they might appropriately be addressed through Government intervention.

Context

Professor Garnaut has described climate change as a 'diabolical' problem for governments – it has global and intertemporal dimensions which mean that it cannot be solved by short-term action taken by any one country. While there is an increasing consensus around the scientific evidence that supports the existence of climate change, predictions of future impacts, and an evaluation of the future benefits of taking action to reduce emissions now, are characterised by high degrees of both uncertainty and risk.

Earlier this year the Rudd Government sought to reposition Australia within this international debate by ratifying the Kyoto Protocol. Australia now has a seat at the table in shaping a post-Kyoto international agreement.

Given Australia will be significantly impacted by an agreement to reduce emissions (considering its resource and emissions profile) and by the consequences of global warming (including drought), it makes sense to start as soon as possible and demonstrate leadership in reducing our own emissions to provide impetus for other countries to do the same.

The Australian Government also has the opportunity to be world-leading in its approach to mitigation. To the Review's knowledge, no other country has successfully implemented a comprehensive ETS and concurrently sought to ensure that it's existing policies and programs support, rather than undermine, that scheme.

The other aspect of the Australian Government's approach that will be heavily scrutinised is how it responds to vested interests and legitimate concerns about the potential impact on some households and businesses of the ETS. Addressing these issues without undermining the very incentives that the scheme is intended to provide will require careful judgement.

Further, in an economy close to full employment, the potential for government intervention to distort the allocation of resources away from their highest value use is arguably more significant than at other times.

The broad scheme design features and additional measures outlined for public comment in the Green Paper represent a promising start in meeting these challenges.

Structure of the Report

The Review's overall findings, conclusions and recommendations are contained in this *Report of the Strategic Review of Climate Change Programs* (the Report). It contains eleven chapters as follows:

- Chapter 1: Principles for complementary policies
- Chapter 2: Programs reviews (to be read in conjunction with Appendix 4)
- Chapter 3: Institutional and governance arrangements
- Chapter 4: Information
- Chapter 5: Energy efficiency
- Chapter 6: Support for low emissions technology
- Chapter 7: Energy markets and industry development
- Chapter 8: Other markets
- Chapter 9: Science and adaptation
- Chapter 10: International
- Chapter 11: Future directions and transition

01

CHAPTER ONE:
PRINCIPLES FOR COMPLEMENTARY POLICIES

Summary

This chapter outlines the Review's principles for determining whether programs or measures are complementary to an ETS. These 'principles for complementary policies' are grounded in an understanding of why, how and when the government should intervene and emphasise the preeminent role of an ETS in achieving cost effective reductions in Australia's greenhouse emissions.

- **Principle 1** (mitigation): The Government should rely on the ETS to achieve least cost abatement and only take action in addition to the scheme where there is a demonstrable and compelling case that the market is not working efficiently and that government action will not distort or undermine the scheme.
- **Principle 2** (adaptation): The Government's key role in adaptation should be to facilitate informed decision making across the economy.
- **Principle 3** (other policy priorities): The Government should take into account the potential for its non-climate change policies to compromise or enhance the ability of the ETS to achieve least cost abatement.
- **Principle 4** (roles and responsibilities): The Commonwealth should be primarily responsible for mitigation policy and all jurisdictions should contribute to a nationally coordinated approach to adaptation.
- **Principle 5** (good policy design): As in all areas of policy, climate change measures should conform to the best practice policy design, including the need for an evidence-based assessment of options and rigorous evaluation.

1.1. Introduction

The Government has clearly articulated three climate change policy priorities[2].

- reducing Australia's emissions at least cost (mitigation at least cost);
- adaptation to climate change that we cannot avoid (adaptation); and
- helping to shape a global solution (international).

An ETS, to be introduced by 2010, will be the primary means of addressing the first of these priorities. The aim is to achieve a national market for carbon that demonstrates Australia's business acumen and ingenuity on the problem of reducing Australia's greenhouse emissions and transforming Australia into a low-carbon economy.

The introduction of an ETS represents a fundamental shift in Australia's response to climate change and it needs to be accompanied by an equally fundamental change to the way the Government, and its advisers, approach climate change policy as a whole.

As required by its terms of reference, the Review has developed a set of principles to guide the Government's consideration of what measures may be required in addition to an ETS. The Review's principles for complementary policies are essentially the application of the standard framework for designing good public policy to a political and economic environment shaped by the price of carbon.

2 Wong, 2008

The principles also address decision making about adaptation and could be employed in considering options for Government action at an international level. This reflects that the Government's three climate change priorities cannot be considered in isolation – each of these priorities is interlinked to some degree (for example, a domestic ETS may eventually be linked to other schemes internationally as part of progress towards a 'global solution').

This chapter articulates the Review's five principles for complementary policies.

Subsequent chapters of the report apply the Review's principles to existing programs (Chapter 2), discuss institutional arrangements to support the application of the principles (Chapter 3) and use the principles as a framework for considering gaps that might exist in the Government's current approach (Chapters 4–10).

Recommendation 1

The Government should adopt the 'principles for complementary policies' as its framework for deciding whether its policies (either existing or proposed in the future) will help or hinder the work of an emissions trading scheme (ETS).

- ***Principle 1**: The Government should rely on the ETS to achieve least cost abatement and only take action in addition to the scheme where there is a demonstrable and compelling case that the market is not working efficiently and that government action will not distort or undermine the scheme.*
- ***Principle 2**: The Government's key role in adaptation should be to facilitate informed decision making across the economy.*
- ***Principle 3**: The Government should take into account the potential for its non-climate change policies to compromise or enhance the ability of the ETS to achieve least cost abatement.*
- ***Principle 4**: The Commonwealth should be primarily responsible for mitigation policy and all jurisdictions should contribute to a nationally coordinated approach to adaptation.*
- ***Principle 5**: As in all areas of policy, climate change measures should conform to the best practice policy design, including the need for an evidence-based assessment of options and rigorous evaluation.*

1.2. Principle 1: rely on the carbon market

The Review's starting point for considering measures that are complementary to an ETS is that the Government should not pursue additional measures unless there is a demonstrable and compelling case that the carbon market is not working efficiently. In the absence of such a case, additional government action is in danger of undermining the market and distorting the carbon price.

- No set of 'complementary' measures will be capable of delivering emissions reductions at a lower cost to the economy as a whole than a well-functioning and credible ETS.

Principle 1 is concerned with determining whether new policy proposals address causes of market inefficiency and proposes the use of the price of carbon, implicit in the proposed measure, as the starting point for a broader inquiry into their merits.

Proponents of a measure in addition to the ETS must demonstrate that the measure will deliver additional abatement at a cost lower than the market price. That is, they bear the burden of proof in relation to the need for additional measures and making the case that their proposal will not distort or undermine the market.

Principle 1

The Government should rely on the ETS to achieve least cost abatement and only take action in addition to the scheme where there is a demonstrable and compelling case that the market is not working efficiently and that government action will not distort or undermine the scheme.

- *For new policy proposals which have as an objective abatement in a sector covered by the ETS, establishing such a case starts with comparing the proposal's implicit carbon price to the market price set by the ETS.*
- *To the extent that the proposed abatement measure ought to be viable but is not being taken up, the underlying reason for this needs to be diagnosed.*
- *Where the underlying source of the inefficiency in the ETS is a significant market failure there may be a case for the government to intervene, subject to principles 4 and 5.*
- *If the proposal has an implicit carbon price higher than the market price, the Government may still decide to proceed for reasons other than abatement but should be guided by principles 3, 4 and 5.*
- *In relation to sectors not covered by the scheme:*
  - *measures which facilitate the sector's eventual coverage in the scheme are preferable to attempting to impose an equivalent carbon price on the sector in the short-term; and*
  - *if it is not anticipated that the sector could ever be covered by the scheme, then, in principle, imposing a broadly equivalent carbon price on the sector should be pursued.*

1.2.1. The carbon market

The Government's recently released Green Paper affirmed the key design elements of the ETS, announced at the start of 2008 (outlined in Box 1.1 below).

The scheme to be implemented by 2010 will be a 'cap and trade' scheme. Under the model outlined in the Green Paper, the Government will set a budget for total emissions over a period of time that will limit the emissions from activities or sectors covered by the scheme – expressed as short-term emissions caps and longer-term targets. The Government has committed to a long-term target of reducing Australia's emissions by 60 per cent (from 2000 levels) by 2050. Short-term caps will be set in due course following the modelling exercise being undertaken by the Treasury and the Garnaut Review, and after final decision are made on scheme design.

Box 1.1: Australian ETS – key design features

- The ETS will be a 'cap and trade' scheme – scheme caps will be designed to place Australia on a low emissions path, in a way that best manages the economic costs of transition. The scheme will be designed to facilitate international linkages in the future.
- The scheme will have maximum coverage of greenhouse gas emissions and industry sectors, to the extent that this is practicable.
- The scheme will address the competitive challenges facing emissions-intensive, trade exposed industries in Australia and will also address the impact of emissions trading on strongly affected industries.
- Measures will be developed to assist households, particularly low income households, to adjust to the impact of climate change.

Tradeable emissions units will be issued equivalent to the scheme's emissions budget. By setting that budget below what would occur under a business as usual scenario, the units have scarcity value. Companies in sectors covered by the scheme choose whether it is more costly to reduce their emissions or to purchase units that cover their emissions.

As the emissions budget applies to the scheme as a whole, and is not divided up between specific sectors, the ETS allows emissions to be reduced at least cost to the economy. To the extent that a lot of abatement is available relatively inexpensively in one sector, an ETS ensures that these opportunities are taken up before progressively more expensive abatement opportunities in the same and other sectors of the economy. That is, the ETS achieves emissions reductions at least cost to the economy because it will facilitate emissions units going to their highest value use. Another important consequence of this model is that the broader the coverage of sectors, the lower the overall economic cost of the scheme will be (as there are more abatement opportunities to be exploited).

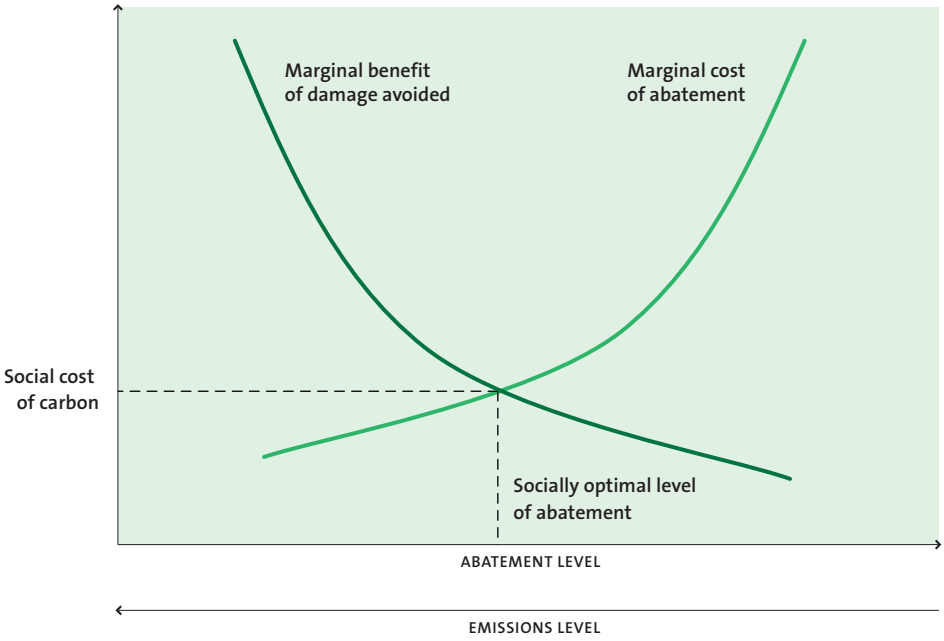
A model of sectoral burden sharing would impose a higher cost on the economy since each sector would have to achieve a particular level of abatement, regardless of whether that abatement could be more inexpensively achieved elsewhere. Importantly, it is highly unlikely that any other measure will be able to deliver abatement as cheaply as the ETS.

1.2.2. The cost of carbon

The ETS is essentially an intervention to address a market failure – the *negative externality* associated with greenhouse emissions. Because the full cost of these emissions is not reflected in the prices faced by producers and consumers, a more than socially optimal amount of emissions is generated. However, there are also costs associated with reducing emissions. The social cost of carbon is effectively the point at which the marginal cost of reducing emissions equals the marginal cost of the damage avoided (see Figure 1.1 below).

- Policies such as an ETS or carbon tax will perfectly correct for the negative externality associated with greenhouse emissions if they produce a carbon price equal to the social cost of carbon.

Figure 1.1: Deriving the social cost of carbon



Source: Lehman Brothers, 2007

However, this is the problem in its simplest form. Greenhouse emissions are also a negative externality with global and intertemporal dimensions – an individual country's emissions are not directly related to the impact of climate change they may experience in the future. It is also a 'stock' rather than a 'flow' problem – what matters is the build up of emissions in the atmosphere over time rather than emissions in a single year (although they too contribute to the stock). It is these problematic aspects of emissions (among others) which led to climate change being described as 'the greatest market failure the world has ever seen'[3]. These characteristics make any derivation of the true social cost of carbon a very difficult and highly complex exercise.

With an effective ETS, it will always be possible to purchase abatement in the market at a known price. The market price of emissions units under the ETS reflects the point at which, given current technology and a given emissions budget under the scheme, it becomes cheaper to emit rather than abate – the 'carbon price'. The scheme will also establish a forward price curve which will provide an important signal to investors – particularly those with long-lived assets.

While the market price set through the ETS may not equal the 'social cost of carbon', the Review considers that it will be a legitimate proxy for it in policy making. The ETS may not perfectly correct the negative externality of greenhouse emissions – particularly a domestic scheme operating in the absence of a global solution. However, the aim is to set an emissions budget – that is the amount of abatement to be achieved – such that Australia achieves a 'socially optimal' result.

3 Stern, 2007

There are a range of reasons why the Government may decide to adopt a less than socially optimal emissions budget. In such a situation, to the extent that the Government wants to achieve more abatement, in order to get closer to a socially optimal amount, it would be more efficient to do so through adjustments to the scheme than through other policies.

There may also be issues beyond the abatement task actually set by the ETS such as market expectations of changes in government decisions, the scope for market manipulation etc. that result in the market price under the ETS being less than the social cost of carbon.

This reinforces the importance of getting the institutional framework of the market 'right' and in the Government giving clear signals about how it will make decisions about the scheme (and complementary measures) in the future.

That is, the Government decisions and decision making processes must be credible and consistent in order to provide investors with the level of certainty needed to underpin business expectations and investment.

1.2.3. Using the carbon price

Just as there is a carbon price established by the ETS, all other policies that purport to reduce emissions have a marginal cost of abatement embedded in them – that is, the cost per tonne of carbon saved (or avoided) through the Government undertaking certain actions.

With an ETS, the implicit carbon price of a new policy proposal that purports to achieve abatement in a sector covered by the scheme should act as the starting point for a broader inquiry into its relative merits (see section 1.2.5 below for a discussion of abatement measures in sectors not covered). Practical issues associated with calculating the implicit carbon price for new policy proposals are discussed in Chapter 3.

If the implicit carbon price in the proposal is higher than the market price, then Government support for the proposal is unlikely to be justified as it would be inconsistent with the principle of achieving reductions in Australia's emissions at least cost to the economy. As discussed in relation to principle 3, it is possible that the Government may pursue policies for reasons other than abatement but it needs to take into account the potential impact this may have on the ETS and its ability to achieve least cost emissions reductions.

If the proposal's implicit carbon price is lower than the market price then the question arises why an opportunity for abatement that ought to be viable is not being taken up? There may be impediments or barriers which are causing the carbon market to operate inefficiently.

The Review is assuming that once implemented, the ETS will be credible and effective in its ability to deliver least cost reductions in Australia's emissions. However, the final design of the scheme is yet to be determined, and the final shape of the ETS will influence what could be considered complementary to it. The Review's principles are sufficiently generic to provide a framework for considering the need for complementary measures in light of the design features finally adopted.

1.2.4. Potential market failures

To the extent that there are barriers to opportunities for abatement being taken up that ought to be viable, they might justify some government intervention. The failure of markets to deliver efficient (or 'socially optimal' outcomes) can derive from a number of causes[4], including, but not limited to:

- *Externalities* (or 'spillovers') – where an individual or firm can take an action that affects others but for which it neither pays (in relation to negative externalities) nor is paid compensation (in the case of positive externalities). In the presence of externalities, a product may be oversupplied (negative externalities) or undersupplied (positive externalities).
  - Greenhouse emissions are a negative externality, as discussed above.
- *Public goods* – are an extreme case of positive externalities as no one individual or firm has the ability to exclude another from consuming such goods (the property of non excludability), and consumption by one does not subtract from another's ability to consume (that is, consumption is non-rivalrous).
- *Information failures* – for markets to operate efficiently, all market players need to have access to (or the ability to access) information about the goods or services being traded. It is sometimes the case that one party has less information than the other or that both parties have incomplete information.
- *Barriers to effective competition* including economies of scale or scope or barriers to entry or exit – may enable firms to manipulate market outcomes. This may only be a temporary phenomenon that is eventually competed away, or a more permanent feature of the market.
- *Split incentives* – where the interests of the producer or owner of a particular product diverge from the incentives facing the product's end users.

As noted recently by the Productivity Commission (2008), market failure only creates a *potential* case for government intervention, as principle 5 seeks to emphasise, the costs of correcting for the market failure may outweigh any benefits. As suggested by the Productivity Commission, what governments should be concerned with are market failures 'of sufficient significance' to justify government intervention. Climate change-related measures face an additional hurdle — namely, whether the policy objective is already met by the ETS[5].

Current policy settings may also act as a barrier to the efficient functioning of markets – for example, regulatory settings which set prices for particular goods or services below their market value, or a lack of certainty about how a new area of activity may be regulated in the future, or clarity about how such decisions may be made.

Applying these general theories to a diagnosis of why an abatement opportunity which ought to be viable is not being taken up, this could be because the opportunity:

- is not widely known by those with the ability to take it up (that is, information failure);
- requires an investment in infrastructure which no one private entity has sufficient incentive to undertake (perhaps due to economies-of-scale);

4 Stiglitz, 1997 provides a useful overview of market failure

5 Productivity Commission, 2008, p xxi

- requires a new technology to be demonstrated or trialled which no one private entity has sufficient incentive to undertake (that is, due to spillover effects); or
- requires changes in current regulatory settings (that is, past government actions are in themselves a barrier). For example, the regulation of energy prices which distort the impact of the carbon price signal (amongst other things).

Based on this diagnosis, what, if anything, can the Government do to ameliorate the source of the market inefficiency identified? Answering this question requires careful consideration, taking into account that poorly targeted Government action may actually do more harm than good.

In all policy areas, there is a real risk that government intervention could distort decision making by governments, businesses and households and direct resources from more to less productive uses, imposing a deadweight loss on the economy – a risk which is exacerbated in an economy operating at, or close to, full employment, such as Australia is now[6]. The risk and consequences of 'government failure' are as real in high priority areas such as climate change as in other policy areas.

1.2.5. Uncovered sectors

The Government has committed to a scheme with the broadest possible coverage of sectors – which is consistent with the principle of reducing Australia's emissions at least cost to the economy. However, final decisions on scheme coverage will not be made until after the Review is finalised. For completeness, the Review has included some general points about measures in sectors not covered by the ETS as part of its principles.

The main reason why a sector might not be covered by the ETS, at least initially, is difficulty in measuring and accounting for its emissions. To the extent that these difficulties are severe enough to prevent the sector from being covered, they are also likely to pose a difficulty in designing an alternative measure which seeks to impose a broadly equivalent carbon price on the sector.

If a sector is not covered by the ETS, and therefore does not directly experience the carbon price imposed on covered sectors, then in general:

- measures which facilitate the sector eventually being covered by the scheme are preferable to attempting to impose a broadly equivalent carbon price on the sector in the short-term; and
- if it is not anticipated that the sector could ever be covered by the scheme, then, in principle, imposing a broadly equivalent carbon price on the sector should be pursued.

6 Henry, 2007

1.3. Principle 2: facilitating adaptation decisions

Principle 2

The Government's key role in adaptation should be to facilitate informed decision making across the economy as individuals, households, communities, businesses and governments consider how to adjust their behaviour in response to the risk of unavoidable climate change.

As part of this role, there may be a need for the Government to help identify and build a common understanding of: the risk of unavoidable climate change; how it may impact on different parts of the Australian environment and community; and who is best placed to manage these risks.

Issues around adaptation are dealt with more fully in Chapter 9. However, the starting point for adaptation policy is: what do individuals, households, communities, businesses and governments need in order to make informed choices about how to adjust their behaviour and decision making in response to the risk of unavoidable climate change?

Answering this question will involve a common understanding of: the risk of unavoidable climate change; how it may impact on different parts of the Australian environment and community; and who is best placed to manage these risks.

As the impact of unavoidable climate change will vary across different parts of Australia, the information and actions required in response to these impacts will also vary across the nation – indicating that there will be different roles for different jurisdictions as outlined in Principle 4.

1.4. Principle 3: potential policy compromises

Principle 3

There are a range of valid reasons why the Government may wish to intervene in a particular area – for example, for reasons of social equity, industry development (where there are demonstrable barriers to growth), or in response to short-term adjustment pressures.

However, the scope for the Government's non-climate change policies to compromise or enhance the ability of the ETS to achieve least cost abatement should be taken into account.

There are a range of valid reasons why the Government may wish to intervene in the climate change arena in addition to concerns about market failure – for example, for reasons of social equity, industry development (where there are demonstrable barriers to growth) or in response to short-term adjustment pressures. Equity in particular is a potentially compelling rationale.

The potential for different policy imperatives to be in conflict with one another is one of the basic challenges of governing, and climate change will be no different in this regard. The Government will come under pressure to take decisions which may compromise the ability of the ETS to achieve least-cost abatement.

For example, compensating particular groups or assistance to particular industries may change their incentives to achieve abatement – potentially making the overall abatement task under the ETS more difficult to achieve. Alternatively, pursuing other reforms may actually make the economy better able to adjust to an emissions constraint (such as the deregulation of energy markets).

Building on principle 1, where the implicit carbon price of new policy proposal is above the market price, then government intervention to make up this price differential will only add to the cost of achieving a particular level of abatement. To the extent that the Government still chooses to proceed, for reasons other than abatement, it needs to be very clear about the impact this will have on the ETS, and hence on the economy as a whole, and this should be taken into account in the decision making process.

1.4.1. Equity

Economically efficient outcomes may not be equitable (or 'fair') – there may be legitimate reasons for the Government to intervene in how the costs and benefits of change are shared across the community (demographically, geographically and intertemporally).

For example, while an efficient means of reducing Australia's emissions, the ETS is expected to be mildly regressive – all households will experience higher prices for carbon intensive goods and services (such as energy), and increases will be least affordable to low income households.

Low income households usually spend a greater proportion of their disposable income on fuel, electricity and food and have less discretionary income from which increases in the price of these goods can be absorbed. Further, they may face other impediments to changing the carbon intensity of their consumption – such as access to capital and information – which they are also less well placed to overcome than households on higher incomes.

The introduction of the ETS is not intended to have significant adverse income and distributional effects and the Government has committed to ameliorating these effects in some way. The Government has a number of tools at its disposal to address these kinds of equity issues:

- If the concern is to address loss of purchasing power, measures that would directly target this issue, such as through the tax and transfer payment system, would be preferred as the most economically efficient and least cost approach. The ETS implementation package and Australia's Future Tax System Review are expected to consider this issue, and the Review does not seek to address such issues in detail.
- If equity is a concern in the context of addressing other identified market failures, such as overcoming barriers to low income households accessing energy efficiency opportunities then other measures may be required. However, there are a number of lessons learned and ideas that have emerged from the Review about how to most effectively support low income households which are pertinent. These are discussed further in Chapter 5.

1.4.2. The transition to an ETS

Related to issues of equity are legitimate concerns about the process of 'adjustment' that will follow the introduction of an ETS. There are a range of finely balanced considerations facing the Government in terms of how and who it 'cushions' the adjustment for. Its decisions in this area will potentially have implications for the net-incentives which particular groups face to adjust their behaviour and decision

making. The Green Paper outlines the Government's preferred approach to compensate for cost of living increases through the tax and payment system, and provide targeted support to certain sectors and groups in the transition to a fully functioning ETS. This includes a commitment to will cut fuel taxes to offset the initial price impact on fuel associated with the introduction of the scheme.

1.5. Principle 4: roles and responsibilities

Principle 4

The Commonwealth should be primarily responsible for mitigation policy and all jurisdictions should contribute to a nationally coordinated approach to adaptation.

- *Beyond this high-level principle, a decision as to which level of government is best placed to intervene in relation to climate change should consider the following:*
  - *Where the underlying problem or issue to be addressed exists at a national level or is common across a number of States and Territories, prima facie the Commonwealth should be responsible for leading and coordinating action.*
  - *Where the underlying problem or issue to be addressed is more dispersed or differs substantially across regions then more localised action is likely to be justified, and individual States and Territories should lead and coordinate such action.*
  - *Where the issue is one that has to do with income support, the Commonwealth should be responsible because it controls the relevant policy levers (for example, the tax and social security systems).*
  - *The need to minimise the compliance burden on business resulting from differing regulation across States should be taken into account.*

The consequences of many jurisdictions pursuing the same or competing goals in the same policy space (whether it be climate change or some other area) is likely to lead to duplication, complexity, wasted resources and questionable results. Such a situation is not in the national interest. This is demonstrated by the current plethora of climate change programs across jurisdictions.

As discussed in Chapter 3, this situation can, in the Review's opinion, be attributed to a lack of clarity around roles and responsibilities in relation to climate change, caused by the failure of the previous Commonwealth Government to set out a clear framework for climate change policy. The Review proposes a National Climate Change Compact to resolve the current uncertainty and provide a better framework for coordinated action in the future.

Under the *subsidiarity principle*, a good or service should be provided by the level of government closest to the region that will benefit from the service as it is best placed to discern the preferences and circumstances of the communities and is therefore more capable of assessing the efficient level of goods and services that need to be provided[7]. However, in a federation where the nature of the good or service is most efficiently delivered through a national market (for example, energy, consumer goods and financial services) then the appropriate level of government is the Commonwealth.

7 Oats, 1999

Carbon is a perfect commodity and ultimately should be freely traded internationally. From this perspective, it would be undesirable for the trade in carbon within Australia to be subject to restrictions across States.

A related concept is the *benefit principle of expenditure* which suggests that action should be taken by the jurisdiction within which the benefits are likely to accrue. If the benefit arising from the provision of a good or service in one State spills over to other States, the benefit principle suggests that the highest level of Government should intervene. For example, national public goods such as defence should be provided by the Commonwealth. The capacity for jurisdictions to control the policy levers associated with an issue or problem will also be relevant in determining which level of government is best placed to intervene.

Also relevant in this context is the desirability to minimise the compliance burden on businesses, and confusion for consumers, resulting from differing regulation across States. For example, the Productivity Commission has concluded that 'improving productivity and efficiency in energy, transport, infrastructure and other activities through the competition and regulatory reform streams could provide resource savings of around $10 billion'[8].

Applying these concepts to Australia's climate change policy, the Review considers that the Commonwealth has primary responsibility for mitigation policy but that each jurisdiction will have important roles to play as part of a nationally coordinated approach to adaptation. As noted in principle 2, the role of the Commonwealth in relation to adaptation should primarily focus on facilitating informed adaptation decisions. Chapters 3 and 9 address these issues in more detail.

1.6. Principle 5: best practice policy design

Principle 5

As in all areas of policy, climate change measures should conform to the best practice policy design, including the need for an evidence-based assessment of options and rigorous evaluation.

- *Where, based on principles 1–4, a rationale for Commonwealth Government intervention can be constructed, it still needs to be established that:*
  - *the underlying 'problem' – for example the market failure causing the ETS to operate inefficiently – is actually amenable to being addressed through government intervention; and*
  - *the benefits of any intervention would outweigh the costs to the economy as a whole.*
- *The design of any Commonwealth Government intervention should:*
  - *specify a clear policy objective – what does the Government expect to achieve in addressing the market failure or policy objective identified?*
  - *consider all available policy instruments (including the modification of existing ineffective or overlapping programs) on the basis of evidence as to the most efficient and effective means of addressing the stated policy objective;*
  - *require the administering agency to develop and implement a robust evaluation plan, including the specification of performance indicators and risk management strategy; and*
  - *provide for regular opportunities to review performance and if warranted, terminate the intervention or to redirect resources.*

8 Productivity Commission, 2006

1.6.1. Alternative forms of government intervention

When faced with a policy problem, the Government always has two choices: to do nothing and 'wait and see'; or to take some form of action. If it chooses to take action, this would usually fall into one of the following three categories, or be a combination of any of them:

- **Direct action** – the Government can either directly provide a product (which includes information) or a service (such as public schools or hospitals), or purchase a good or service from the private sector.
- **Provide incentives for private action** – the Government can incentivise agents to act a certain way (for example, a grant which subsidises the cost of investing in a new production plant or an income contingent loan to fund tertiary studies) or by creating property rights from which private agents extract value (for example, intellectual property rights).
- **Mandate private action** – the Government can compel individuals, households or companies ('agents') to take positive action (for example, wearing bike helmets) or prohibit specific activities (for example, the sale of televisions below a minimum energy standard). The requirement would be backed up by some form of legal sanction or threat of punishment.

It should be noted that not all market failures (or situations of social inequity) are amenable to government intervention, and they are not always static over time. Market participants may find ways of overcoming particular challenges without government assistance.

The choice of whether to take action, and what form that action should take (with options ranging from 'command and control' style measures to market based incentives), needs to be based on a careful assessment of all relevant costs and benefits.

1.6.2. Weighing up costs and benefits

1.6.2.1. Costs of government intervention

The obvious costs of government intervention are the dollars reported in various budget papers and government publications. However, this does not provide a complete picture – any government intervention involves costs to the economy beyond fiscal outlays that may be involved.

As noted above, in an economy operating at, or close to, full employment, such as Australia is now, there is a real risk that government intervention, or poorly targeted intervention, will distort decision making by governments, businesses and households and direct resources from more to less productive uses, imposing a deadweight loss on the economy.

Every government intervention also has an embedded opportunity cost – that is, the alternative uses of the public funds to be expended. Government intervention may also have unintended consequences such as creating a culture of 'learned helplessness' by inducing dependence by particular groups on government assistance.

In this context, it would be prudent for the Government to 'wait and see' rather than intervening unnecessarily. While inaction may create negative perceptions in the short term, in the longer term the Government is likely to end up with better policies.

Additionality is also an important concept in weighing up the costs and benefits of government intervention. In general terms, if an activity would have occurred anyway then subsidising that activity will displace private investment. That is, no net increase in activity will be achieved but the cost of the activity, to the economy as a whole, will be higher[9].

If the subsidy or grant is necessary for an abatement measure to be taken up, even in the presence of a carbon price, then it is not likely to be among the economy's least cost abatement opportunities. Subsidising a particular form of abatement will displace other, lower cost, forms of abatement and thereby increase the overall cost of abatement borne by the economy without increasing the overall amount of abatement.

1.6.2.2. Credibility of the ETS

Further, the Government's decision to intervene in addition to the ETS will have implications for the credibility of the scheme itself. The ETS needs to have credibility if it is going to drive Australia's long-term transformation to a low carbon economy and this will be undermined if there is a general belief that the Government will consistently accede to any and all calls for special assistance from those seeking to insulate themselves from the carbon price signal at the taxpayer's expense.

As noted by the Productivity Commission (2008), giving in to calls for special assistance 'would help foster a perception that governments are amenable to interfering with the least cost abatement objective of the ETS... [and] could encourage other potential beneficiaries to seek special programs that neither increase abatement nor reduce its cost'[10].

1.6.2.3. Distributional impacts

In relation to considerations around social equity or in considering the distributional impact of a particular government action, the following general points may be relevant.

- The impact of the proposal on the capacity of individuals to choose how they live their lives. In this context, the principle of consumer sovereignty – individuals are the best judges of what is in their own best interests and that their choices should be respected – is relevant.
- The impact of the proposal on a individual or group's ability to participate in different aspects of society/the community.
- How does the proposal impact on the complexity faced by agents? Is the pace of change too quick and costly?

A robust assessment of the potential benefits of the proposal should include a consideration of who the benefits will be distributed among. For example, to the extent that the Government subsidises a company to continue its domestic manufacturing operations who, beyond the company's shareholders, benefits from this?

9 The Productivity Commission, 2007, provides a helpful explanation of the concept of additionality in the context of public support for science and technology.

10 Productivity Commission, 2008, pxvii.

1.6.3. Best practice policy design and evaluation

A key finding from the Review's assessment of existing climate change programs is that program objectives have generally been poorly specified and that too little attention has been paid to the ongoing evaluation of programs. The two are likely to be connected – a focus on evaluation in the policy design phase requires greater thought to be given to the specification of program objectives.

Clear evidence as to the scope and nature of the issue to be addressed and the consequences that may flow from different forms of action taken to address the underlying issue needs to be identified and understood as part of the policy design process.

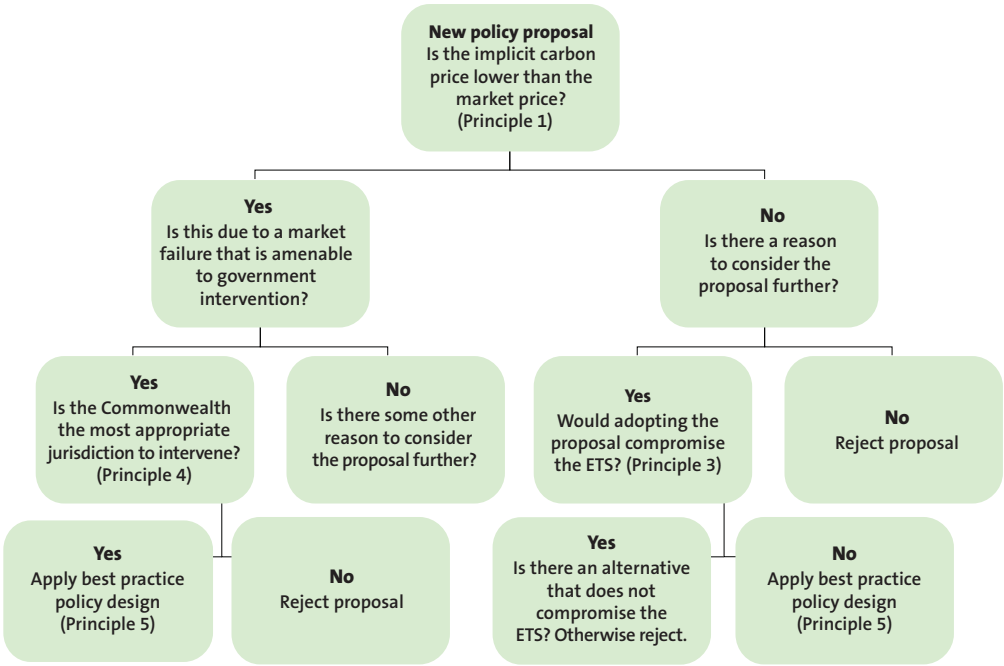
The Review therefore proposes that the Government actively seek to improve performance in this area in respect of future programs and in refocussing and redesigning existing programs, as recommended in Chapter 2.

Another finding of the Review's assessment of programs is that the 'default option' for program design has been for grant programs with set funding envelopes over time periods that do not necessarily bear any discernable relation to the issue the program purports to address. This too can be avoided with a more deliberative and wide ranging scoping of the Government's options in relation to the tools it has available to use and their relative merits in delivering the stated objective.

1.7. Applying the principles

Applying the Review's principles for complementary policies in practice, can be thought of as a decision tree. An example of how this might work in relation to a new policy proposal which has mitigation as one of its main objectives is shown in Figure 1.2 below.

Figure 1.2: Applying the principles to mitigation measures



1.8. Conclusion

The Review's proposed principles of complementary policies will hopefully not come as a surprise to those with a background in policy making – they are essentially the application of a robust policy making framework to a new operating environment. Their successful application requires careful thought and a solid evidence base.

The ETS is the best instrument to deliver least cost abatement. Unless very well conceived, complementary measures are unlikely to lead to more abatement than can be achieved through the ETS and are likely to increase the cost of abatement. The Government must be mindful of the additional economic costs its actions will impose on the economy where it seeks to implement complementary measures. This is important for the credibility of the scheme and its ability to achieve least cost abatement.

There are likely to be grounds for government action in key areas of market failure, and these are discussed in more detail in subsequent chapters: information asymmetries (Chapter 4), energy efficiency (Chapter 5), technology spillovers (Chapter 6), industry development in the energy sector (Chapter 7) and the role of microeconomic reform in supporting an efficient ETS (Chapter 8).

The aim of putting a price on carbon (the ETS) is to change the relative price of emissions intensive goods and services. This will necessarily impose a cost on parts of the economy and the Australian community. It is critical that this be well understood by the community. It will mean that electricity and petrol prices will be higher which, as recent public debate has shown, will be politically sensitive.

Community support for doing 'something' is probably high. However, understanding of what this will actually mean, especially in terms of higher prices for all carbon-intensive products, including fuel, is not high. Importantly community concern, and pressure for additional measures perceived as being 'lower cost', has significant potential to derail an effective government response, and needs to be managed. This is discussed further in Chapter 4.

02

CHAPTER TWO:
PROGRAM REVIEWS

Summary

This chapter summarises the outcomes of the Review's assessments of the Government's existing suite of climate change programs using the framework provided by its principles for complementary policies and the value for money criteria of appropriateness, efficiency and effectiveness.

Climate change programs have evolved over time in the absence of a clear underpinning framework or strategy and at times without sufficient evidence. Programs have proliferated across a range of departments often with poorly defined objectives, inconsistent results and no exit strategy. In many cases, it is difficult to come to a judgement as to whether the results sufficiently justify the expenditure.

The introduction of a credible and effective ETS will drive least cost reductions in greenhouse gas emissions, limiting the case for additional government action to reduce emissions.

The 2009–10 Budget provides the Government with an opportunity to commence the process of streamlining the 62 programs towards a set of measures that would be complementary to an ETS. The Review proposes a suite of eight overarching programs that would be complementary to the ETS both in the transition to it, and ongoing.

To ensure continued alignment with Government priorities, complementary measures should be reviewed again once the ETS is in place, in 2011 for the 2012–13 Budget.

2.1. Introduction

The ETS will fundamentally alter the climate change policy landscape – a credible and effective ETS will drive least cost reductions in greenhouse gas emissions; limit the case for additional government action to reduce emissions; and introduce a transparent benchmark, the ETS carbon price, against which to assess calls for further government mitigation action.

- The more credible the scheme and price signal, the more limited the case for complementary measures.

In view of this, the Government established this Review to develop principles to assess what climate change programs would be complementary to an ETS and to apply them to the suite of climate change programs. In addition, the Review was asked to review all existing climate change programs (listed at Appendix 2) against criteria of appropriateness, effectiveness and efficiency. The Review has assessed 62 programs against these criteria to varying degrees.

A number of key observations can be made.

- The introduction of a carbon price will supersede many existing programs – even if programs have successfully achieved abatement outcomes in the past, this does not guarantee that they will be required once a carbon price is in place.

- Climate change programs have evolved over time in the absence of a clear underpinning framework, and have been based on insufficient evidence, leading to a proliferation of overlapping or duplicative programs that have produced inconsistent results.
- There has been a preference for targeted grant and subsidy programs even in cases where such approaches may not be fit for purpose.

A majority of existing programs should, in the Review's judgement, cease or be modified in some way. Some programs may have a legitimate role to play in the transition to emissions trading but not necessarily an ongoing role.

This chapter provides an overview of the Commonwealth's current programs, lessons learned from the program reviews and recommendations for a suite of complementary measures. These are summarised at Appendix 4.

2.2. Existing programs

As of 13 May 2008, the Government had allocated $3.7 billion across 62 programs over four years (2008–09 to 2011–12), including $840 million in 2008–09, to address climate change issues.

- Of this total, the Government announced new funding of $2.3 billion in the 2008–09 Budget for Government commitments. Thirty-two of the 62 programs are election commitments.

Many climate change programs have multiple objectives. However, for ease of analysis, the Review has categorised all Commonwealth programs into six broad categories based on its view of the main program outcome or impact.

- For example, if the main effect of a program is to subsidise the installation of photovoltaic (PV) cells on the roof of a school or house, it is considered as support for the renewable energy industry (producers and installers) and would be categorised as industry development – if the program was simply education the actual installation of a PV panel would not be required.

This categorisation is not without controversy. It is necessarily blunt and illustrates the significant challenge ahead in terms of improving the performance of programs in the future.

Figure 2.1 in Attachment 2.A illustrates the current suite of climate change programs by category, drawing out the Government's election commitments in three key categories (these are discussed below). It is noted that the significant number of commitments would suggest that there are unlikely to be significant savings from implementing the Review's recommendations. Rather recommendations aim to reallocate existing funding to more effectively support government priorities.

Climate change programs by impact category are listed below by the size of expenditure over the forward estimates associated with programs in each category.

- *Technology development and demonstration* (34 per cent) – Government assistance to develop and demonstrate low emission technologies – which includes renewable energy and carbon dioxide capture and storage.
- *Industry development and assistance* (31 per cent) – Government assistance to either (a) overcome barriers to growth in specific industries that are thought to be important to Australia's eventual transformation to a low carbon economy or (b) help sectors adjust to a carbon constrained world.

- *Energy efficiency* (15 per cent) – Government regulation, information and assistance to encourage the uptake of cost effective, proven energy efficiency opportunities for business and households, to reduce their end-use energy consumption.
- *International* (10 per cent) – contributing to international action to support a global solution to climate change.
- *Climate change adaptation and science* (6 per cent) – understanding why and how the climate is changing and the likely impact of climate change on Australia and developing informed strategies and decision making in response.
- *Abatement* (4 per cent) – emissions measurement and reporting, the policy and regulatory framework for climate change mitigation and programs to reduce greenhouse gas emissions.

Programs which essentially fund bureaucratic functions such as policy advice were attributed to the area of policy they seek to address – for example, advice or information gathering associated with abatement was included in that grouping.

2.3. Election commitments

Government commitments (including election commitments) cover half the programs within the scope of this Review, and almost two thirds of expenditure over the forward estimates. Expenditure in the three largest categories – technology development and demonstration, industry development and energy efficiency – can be attributed to Government commitments to either continue existing programs or establish new ones. This is illustrated in Figure 2.1 at Attachment 2.A.

- The increase in support for low emissions technology development and demonstration arises primarily from three new programs – the National Clean Coal Initiative, the Renewable Energy Fund and the Energy Innovation Fund – which together involve additional expenditure of $1.15 billion (some of which was committed to projects during the 2007 federal election campaign).
- The Government's commitments also shift the emphasis in industry development programs to providing more direct information and subsidies to business (Clean Business Australia and Enterprise Connect), but continue indirect measures, such as continuing to subsidise the renewable energy industry through rebates for installing solar hot water systems and PV panels.
- New initiatives in the energy efficiency category are more diverse. The Green Loans initiative should expand the choices households might make regarding investing in energy efficiency. However, counteracting this flexibility are programs that limit choice, including the phase out of electric hot water systems.

The Review has considered the Government's election commitments together with the existing programs in making its recommendations.

2.4. Review program observations

Based on the evidence available, the Review has drawn three observations from the process of assessing the Government's existing programs against the principles for complementary policies and value for money criteria.

1. *The introduction of a carbon price will supersede many existing programs – even if programs have successfully achieved outcomes in the past, this does not guarantee that they will be required once a carbon price is in place.*

The introduction of the ETS as the key mitigation measure will make most existing abatement programs redundant. The only activities in abatement category that will need to be continued are those which support the ongoing development and implementation of the Government's climate change strategy. As discussed in Chapter 3, the Review considers that these functions should be centralised in DCC and resourced accordingly. The exception is those programs that relate to the carbon capture and storage regulatory framework, which should stay with DRET for the duration.

While some programs will be superseded, there will continue to be a need for Government programs to address market failures in the areas of information provision and technology spillovers. These issues are discussed in Chapter 4 (information), Chapter 5 (energy efficiency) and Chapter 6 (technology development).

Subsidies for renewable industry development – such as rebates for PV systems – will also be superseded by the ETS. The carbon price will make investments in such technologies more viable and therefore promote their take-up to the extent that they are part of the least-cost means of achieving the level of reductions required under the scheme.

- Notably, existing subsidy programs have not been effective at developing a sustainable and innovative local industry.

The implementation of the national expanded Renewable Energy Target (RET) plus feed-in-tariffs (FITs) will also provide a significant boost to the renewables industry. Further discussion of issues around support for the renewable energy industry is provided in Chapter 7.

2. *Climate change programs have evolved over time, sometimes in the absence of a clear underpinning framework and have been based on insufficient evidence, leading to a proliferation of overlapping or duplicative programs that have produced inconsistent results.*

The Review's principles for complementary policies are proposed as a means of ensuring that the ad hoc proliferation of programs can be avoided in the future. However, the 'principle' framework will need to be supplemented by evidence based policy and a rationale for government intervention that demonstrates net benefits to society.

- Developing an abatement metric such as cost per tonne and ensuring that a climate change impact statement informs Government decision making (discussed in Chapter 3) will assist in assessing the relative impacts of proposals with regard to the ETS.

On the basis of the evidence available, it is difficult to judge whether the results achieved by existing programs are sufficient to justify the considerable expenditure involved. This stems from two of the key lessons learned from the Review's assessment of programs – many programs have poorly specified objectives and insufficient attention has been paid to program evaluation.

- Multiple, inconsistent or vague objectives can reflect a lack of clarity around the purpose of a program (with a subsequent lack of focus in its management) and make it difficult to demonstrate that a program has delivered against all of its objectives. For example, some program objectives seek to achieve economy wide changes through targeted grant programs which are unlikely to be of sufficient scale to achieve results at that level.
- Where departments have developed performance indicators around existing programs they often measure activity under the program (for example, grant applications processed) rather than outcomes. While such measures can be important in assessing the efficiency of a program, they are not sufficient in themselves. The Review sees this as an area for improvement going forward.

Many programs appear to have been introduced to address short-term announcement imperatives rather than in response to evidence of a need to act. As a result, the growth in the number of programs has been 'lumpy' over time. The 2004 *Energy White Paper* initiatives are an example of this – the speed with which the package of programs was formulated resulted in much of the program design work being undertaken following the announcement of the package.

- This has led to delays in the implementation of some programs – most notably the Low Emissions Technology Demonstration Fund (LETDF). Despite having been announced in 2004, at this point the Review cannot conclude that the program has achieved clear results.

These criticisms are less applicable to programs in relation to climate change adaptation and science – discussed further in Chapter 9. However, this is an area where program consolidation and better coordination appears warranted. Future action would benefit from a national approach on climate change science and access to expert risk advice for adaptation.

There is also significant overlap and duplication between Commonwealth and State and Territory programs. This is discussed further in Chapter 3.

3. *There has also been a preference for targeted grant and subsidy programs even in cases where such approaches may not be fit for purpose.*

Grants or rebates appear to have become a default position in policy making rather than one of a number of potentially useful means for achieving outcomes.

- The delays experienced with LETDF are an example of this. Support for technology demonstration and commercialisation, such as LETDF, which involves one-off funding decisions, does not fit well with the model used for financing and delivering large technology demonstration projects in the commercial sector.
  - In contrast, the Renewable Energy Equity Fund (REEF) while much smaller than LETDF ($17.7 million compared with $410 million) has demonstrated that an innovative approach using a venture capital model can be an effective model, with a return on capital invested for the Government.
- Grants and subsidies in the area of industry development also appear to have been largely ineffective. For example, in eight years, the PV Rebate Program and the Renewable Remote Power Generation Program (RRPGP) have together subsidised the installation of around 16,000 PV systems, but the industry argues that it continues to need support. This suggests that action to support this sector needs to be substantially redesigned.
- The results from grant programs which support project based abatement have been disappointing. The major measure, the Greenhouse Gas Abatement Program (GGAP), struggled to find suitable projects to fund. Where GGAP grants were offered, the Government faced difficulties in concluding grant contracts, and some projects were found to be unviable once contracts had been signed.
  - The Coal Mine Methane Reduction program also appears to have had difficulty finding suitable projects and concluding grant contracts, even though fugitive methane emissions from coal mines was considered a potential area of low cost abatement.
  - On the basis of these experiences, it appears that project based abatement is difficult to achieve through a grants program – further demonstrating why the ETS is a superior approach to achieving large scale abatement.

In general, the program reviews reinforced the need for good program design. This includes evidence based policy that addresses a clear problem, barrier or need, and that is amenable to cost effective Government intervention. Any subsequent program should have a minimum number of clearly articulated objectives, towards an outcome that can be achieved efficiently and measured consistently. Progress should be monitored and delivery modified where necessary. All programs should have an exit strategy.

The Review has made recommendations about a future suite of eight overarching programs that seek to address these issues (see Box 2.1 and Appendix 4).

2.5. Review findings

The Review has employed its principles for complementary policies to come to a view about whether individual programs would be:

- complementary to the ETS;
- transitional to the ETS;
- not complementary to the ETS; or
- able to be redesigned or reconfigured to be either transitional or complementary.

These judgements also took into account the value for money criteria of appropriateness, effectiveness and efficiency.

The principal complementary measure recommended by the Review, is to adopt the principles for complementary measures as a framework to assist government to systematically determine what programs might need be necessary to assist the government meet its priorities in the climate change area.

Box 2.1: Future program suite

The Review proposes that the 62 existing programs be streamlined into eight as follows:

Transitional: programs to assist the transition to a fully functioning ETS

- **Education and information** – Australia's Low Carbon Future Program;
- **Technology** – Carbon Technology Trust;
- **Transition for business** – Climate Change Action Fund; and
- **Industry development** – Electricity Sector Adjustment Scheme.

Ongoing

- **Energy efficiency** – National Energy Efficiency Program;
- **International** – Climate Change International Program;
- **Adaptation** – Climate Change Adaptation Program; and
- **Science** – Climate Change Science Program

The principles (outlined in Chapter 1) essentially focus on questions of market failure, least cost and good policy design.

- Programs that seek to lower the cost of abatement by correcting for under provision of innovation in low emissions technologies or information barriers, including ones that may prevent the up-take of cost effective energy efficiency opportunities, are generally considered to be complementary.
- Programs which seek to improve the knowledge base or address information barriers to inform adaptation decisions are also generally considered complementary, as are measures which support Australia's international strategy.
- Programs which are not least cost, are poorly targeted, or seek to address non-climate change priorities but have a negative impact on the effective operation of the ETS, are generally considered not complementary.

Programs which target low income households, either because of the expected regressive impact of the ETS, or for social equity/redistribution imperatives, may be considered complementary if they are designed well. The Green Paper outlines the Government's intention to use the tax and payment system to address the cost of living impacts of the scheme.

- More generally, the Review supports the Government's announced intention to use revenue from the sale of permits to help households and business adjust to the ETS and invest in clean energy options.

Review findings are summarised in Table A4.1 at Appendix 4 of this Report. Recommendations place programs into four categories:

(a) *Complementary* (green colour code) – measures meet at least two of the principles, including principle 5 (good policy design), and should be continued beyond the introduction of the ETS.

Nine programs are in this category, in the areas of research (CSIRO, ARC and CRC activity) and information provision. It is noted that the research activity will also be the subject of the National Innovation System Review.

(b) *Complementary only if modified* (yellow colour code) – measures that would be complementary only if they were amended to either be delivered on an ongoing basis as departmental core business, or modified to improve performance (including through being integrated as a sub-program of an overarching larger program and redesigned to be more effective).

Twenty-two programs were assessed in this category, mainly in the areas of policy (abatement, adaptation and international), energy efficiency and international.

(c) *Transitional* (orange colour code) – measures to be phased out in the transition to an ETS because they are not expected to be complementary once a fully functioning ETS is in place (for example not least cost abatement) or are not of strategic value to justify Commonwealth intervention. Some of these programs may also need to be redesigned to meet principle 5 (good policy design).

Fifteen programs were assessed as transitional. They essentially covered programs in energy efficiency, industry assistance and technology demonstration.

(d) *Non – complementary* (red colour code) – measures did not meet any of the principles, or have been superseded (by the ETS or another program). Depending on the nature of the program, tailored recommendations suggest how the programs in this category might be phased out.

Sixteen programs are in this category (including four programs that have already terminated). These programs largely sit in the abatement and industry development categories.

2.6. Recommendations

The Review has sought to make detailed recommendations for action for each program in the context of the 2009–10 Budget. These are articulated in Table A4.1, Figure 2.3 in Attachment 2.B.

The 2009–10 Budget process (or earlier in conjunction with the CPRS White Paper) would be the starting point for both the rationalisation and streamlining of Commonwealth programs, and the beginning of the centralisation of policy responsibility in the Minister for Climate Change and DCC (see recommendations in Chapter 3). It is expected that this transition would take some time, and would not be immediate.

The Review proposes that most programs be consolidated into one of eight overarching programs (see Box 2.1). In the Review's view, this consolidation will provide the opportunity for the Government to reconfigure program design to better deliver on its articulated priorities and objectives, in line with the principles for complementary policies.

- It is anticipated that the program consolidation will provide scope for the redesign of initiatives to improve their expected effectiveness to deliver government priorities. New sub-programs would be focused on clear outcomes, be less deterministic and seek to be technology neutral. There may also be an opportunity to better target programs to those most in need of government support.
- Detailed recommendations on how programs might be reconfigured are summarised in Appendix 4.

Adopting the Review's program recommendations would result in a reallocation of resources into priority areas. Whilst there may be some savings from this exercise, the actual scope and scale of the financial implications would need to be formally costed by the Department of Finance and Deregulation in due course.

To ensure that transitional programs are phased out, and to assess the ongoing need for some programs once the ETS is functioning, it is proposed that climate change programs be subject to an independent review in 2011. This would be two years after the introduction of the ETS, with recommendations to be considered in the 2012-13 Budget process.

The Review has recommended that a number of programs should cease as planned or not enter into any new commitments. These recommendations are made in the knowledge that many of these programs have projects underway that may continue for some years, for example in the case of LETDF, perhaps until 2019-20. The Review understands that with these programs, the Government will continue to honour any existing commitments under the program and only realise any savings from uncommitted funds.

The reviews of the National Innovation System and Drought Policy are expected to make recommendations to the Government that are relevant to the design and future of a number of these activities.

2.7. Future policy suite

Principle 5 of the Review's principles for complementary policies requires the Commonwealth to adopt best practice in the design of its policies and programs. The Commonwealth is also taking steps to improve program reporting under the Operation Sunlight initiatives (see Box 2.2).

- Reforms seek to group like activities together for reporting purposes under a reduced number

of over-arching programs, enhancing the visibility of activities and providing an opportunity to examine whether they contribute to the overall desired result, or are overlapping and duplicative, leading to less than optimal outcomes.

- The Review has sought to be consistent with this initiative by seeking to consolidate climate change programs as part of the Government's future policy suite.

To support this more effective organisation of program efforts, programs and their key elements must have clear and measurable performance management information and risk management strategies. Such a process will provide greater assurance of the effectiveness of program implementation and the management of any emerging issues.

Box 2.2: Operation Sunlight

Operation Sunlight is the Commonwealth's reform agenda to enhance the quality, transparency and consistency of Budget reporting.

One of its aims is to establish a more coherent and tighter outcomes framework under which the current large number of activities called programs is consolidated into more sustainable and material groupings for reporting purposes.

Under this framework, a program should be a significant activity that is ongoing in nature and warrants separate reporting because it is financially material (above $50 million) or of high public interest. This approach will lead to the establishment of overarching programs for reporting purposes, drawing together under them relevant activities, or sub-programs.

The first reforms were introduced as part of the 2008–09 Budget, involving streamlined budget papers to improve their transparency and readability.

The Review proposes that the current 62 climate change programs be rationalised into only eight overarching programs in order to:

- focus national action and resources on key priorities and outcomes; and
- better communicate Government actions on climate change (including through streamlined reporting).

The eight overarching programs, would have a number of sub-programs, and be consistent with the principles of complementarity.

A diagrammatic representation of how the number of existing programs would reduce over time and be consolidated into the Government's future policy suite if the Review's recommendations were adopted is provided at Attachment 2.B. Figure 2.3 illustrates how existing programs would fit into the new framework.

Fewer programs does not mean less activity, but rather better focused activity.

Existing programs that the Review recommends continue would in all but one case be consolidated into this eight program structure as sub-programs, as appropriate. This would facilitate funding being reallocated to better deliver government priorities. The exception is the Green Car Innovation Fund, which is the subject of the Review of Australia's Automotive Industry (Bracks Review).

2.7.1. Programs to assist the transition to fully functioning ETS

2.7.1.1. Australia's Low Carbon Future Program

This program would encompass a range of targeted sub programs to inform and educate the Australian community on:

- the nature and operation of emissions trading;
- the roles of different levels of government and what they are doing; and
- actions that can be taken by individuals, households, communities and businesses to reduce their emissions and to improve their use of energy.

There is currently a gap in this area, in terms of a properly conceived and coordinated expert campaign. The program would have a strong education component.

2.7.1.2. Carbon Technology Trust

The Carbon Technology Trust would consolidate the Government's existing low emission technology programs (Clean Business Australia – Climate Ready, Energy Innovation Fund, National Clean Coal Fund and Renewable Energy Fund).

The Trust's aim would be to address technology spillovers and accelerate the availability and take-up of new low emissions technologies by supporting its development and demonstration, through a balanced portfolio of technologies and leveraged investments from the private sector and from State governments. The Trust would be at arms length from Government, but be required to achieve a rate of return and be subject to directions.

2.7.1.3. Climate Change Action Fund

This Fund is designed to facilitate the restructuring of business inputs – labour and capital – following the introduction of a carbon price. It might have the following sub-programs:

- Climate Action in Enterprise – a program modelled on Greenhouse Challenge Plus that disseminates 'best practice' to small to medium enterprises;
- Carbon offsets standards and verification – a program building on Greenhouse Friendly to ensure quality and integrity of claimed carbon offsets;
- Energy Efficiency Opportunities (EEO) – the existing program, which may need to be expanded – for example, it could be voluntary for businesses currently under the threshold;
- The Climate Action Tax Rebate – of a certain percentage of the costs of implementing energy efficiency improvements identified through EEO or certified as 'best practice' under CAE, over a period of time; and
- The Greener Skills Initiative – to support retraining and up-skilling in a range of professions and accreditation of energy auditors and other 'green' professionals.

2.7.1.4. Electricity Sector Adjustment Scheme

The Scheme would provide direct assistance to existing coal-fired electricity generators, and other, related strongly-affected industries, workers and communities. The Scheme might have three sub-programs:

- The expanded national RET – reflecting that the RET is essentially an industry development initiative for renewable energy.
- Renewable Energy Integration Initiative – activities to assist in the successful integration of a larger amount of renewable energy into electricity networks (driven by both the RET and CPRS), investment in better energy forecasting techniques and technologies, and the development of technical standards and codes.
- Adjustment Assistance Allowances – could take the form of grants, tax rebates or free permits to strongly affected firms, individuals and communities.

There are likely to be synergies between the Scheme and the Review's proposed Carbon Technology Trust and the National Climate Change Compact.

2.7.2. Ongoing programs

2.7.2.1. National Energy Efficiency Program

This program would seek to address non-price barriers to the take up of energy efficiency opportunities in the Australian economy. It might have at least four sub-programs:

- National leadership, to provide an opportunity for the Commonwealth to demonstrate leadership on a nationally consistent approach to energy standards, and to reduce the carbon footprint of its own operations;
- Energy efficiency standards, to overcome transaction costs or information asymmetries that act as a barrier to the up-take of energy efficiency opportunities in relation to appliances, electric motors, buildings and transport;
- Assistance for low income households to improve their capacity to overcome information and capital barriers to taking up energy efficiency opportunities; and
- Information for policy design – this would have two elements (a) provide evidence to underpin energy efficiency policy development, and (b) demonstration projects for individuals, businesses and communities to understand how to improve their energy efficiency (especially in the agriculture and transport sectors).

2.7.2.2. Climate Change International Program

This program would provide a framework for Australia's international activities. It might have at least four sub-programs:

- International Climate Partnerships Program – to strengthen Australia's bilateral climate change partnerships and meet international convention commitments;
- International Adaptation to Climate Change Initiative – to assist developing countries in South East Asia, the Pacific islands and East Timor, adapt to climate change;
- International Forest Carbon Initiative – to demonstrate that reducing emissions from deforestation and forest degradation can be part of an equitable and effective international agreement on climate change under the UNFCCC; and
- Asia-Pacific Partnerships on Clean Development and Climate – to develop, deploy and transfer cleaner, more efficient technologies between partner countries.

2.7.2.3. Climate Change Adaptation Program

This program would rationalise activities on adaptation to strengthen coordination and focus government investment on key priorities. It might have the following sub-programs:

- National Adaptation Framework Program – to support development of a national adaptation framework through COAG and provide resourcing for priority initiatives.
  - This may include support for the proposed National Adaptation Advisory Board.
- Agriculture Climate Change Program – to assist farmers to understand and manage the impacts of climate change, including improved seasonal forecasting and risk management.
  - This may include funding for RDCs.

Note that structural adjustment support for farmers to exit farming should be considered in the context of broader agricultural support, and will be subject to the outcomes of the Drought Review.

2.7.2.4. Climate Change Science Program

The Climate Change Science Program will be responsible for improving Australia's understanding of the causes, nature, timing and consequences of climate change so that industry, community and government decisions can be better informed, and developing a national framework for future action.

Recommendation 2.1

The Government should use the 2009–10 Budget process (or earlier if inclined) to begin to rationalise and streamline its existing suite of climate change programs, including its recent government commitments, by adopting the Review's findings and recommendations as outlined at Appendix 4 to the Report.

These findings and actions can be summarised as requiring the Government to:

- *terminate or phase out programs assessed as not complementary to an ETS (16 programs);*
- *continue (including amend) transitional programs until the ETS is fully functional (15 programs);*
- *amend programs that could be redesigned to be complementary to an ETS (22 programs); and*
- *continue programs that are considered complementary to an ETS (9 programs).*

Recommendation 2.2

In rationalising and streamlining its existing suite of climate change programs in accordance with the Review's findings and recommendations, the Government should also seek to:

- *consolidate its expenditure to focus on fewer, better targeted, programs; and*
- *ensure that all programs and sub-programs have clear and measureable performance management information and risk management strategies.*

Recommendation 2.3

The Government should commit to a further Review of its climate change programs in 2011 with its recommendations to be considered in the 2012-13 Budget process.

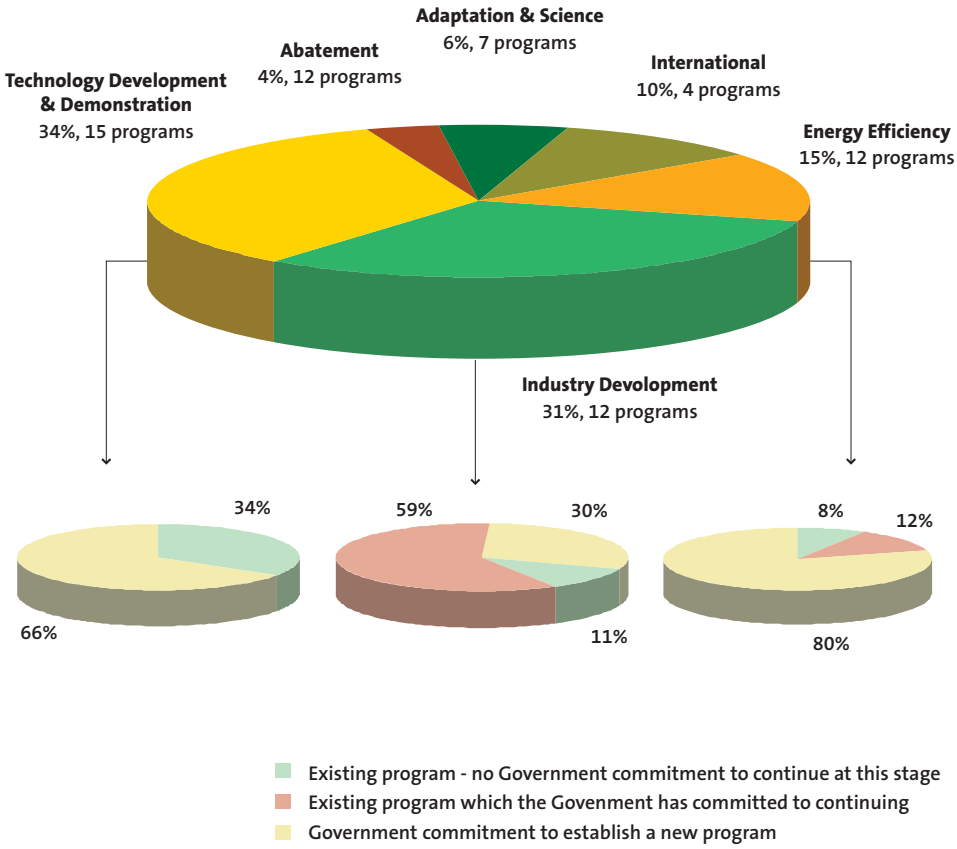
2.8. Conclusion

The introduction of the ETS provides both an opportunity, and an imperative, to streamline existing climate change programs and to adopt a framework for designing future policies that avoids the pitfalls of the past. The proposed suite of eight programs aims to do this.

The accumulation of programs since the late 1990s has resulted in a plethora of sometimes poorly targeted and overlapping programs. The Review has found it difficult to determine the effectiveness of many of the grant and subsidy programs, especially those with vague and multiple objectives. In addition, the implicit price of carbon embedded in many of the programs is very high.

Attachment 2.A: Climate change programs by category and spending

Figure 2.1: Climate change programs by category and spending, 2008–09 – 2011–12 ($3.7 billion)



Attachment 2.B: Proposed future program map

Figure 2.2: Transition to future program suite

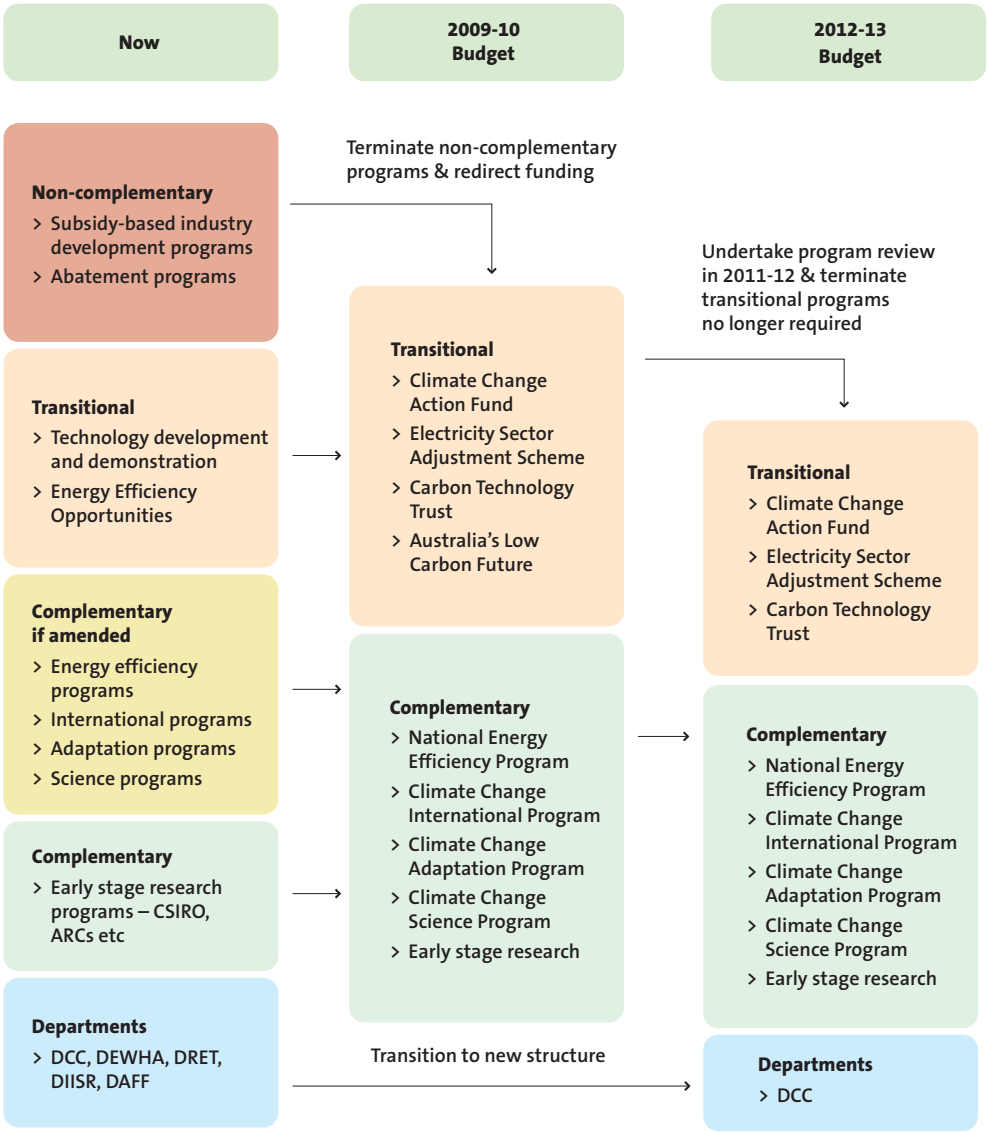
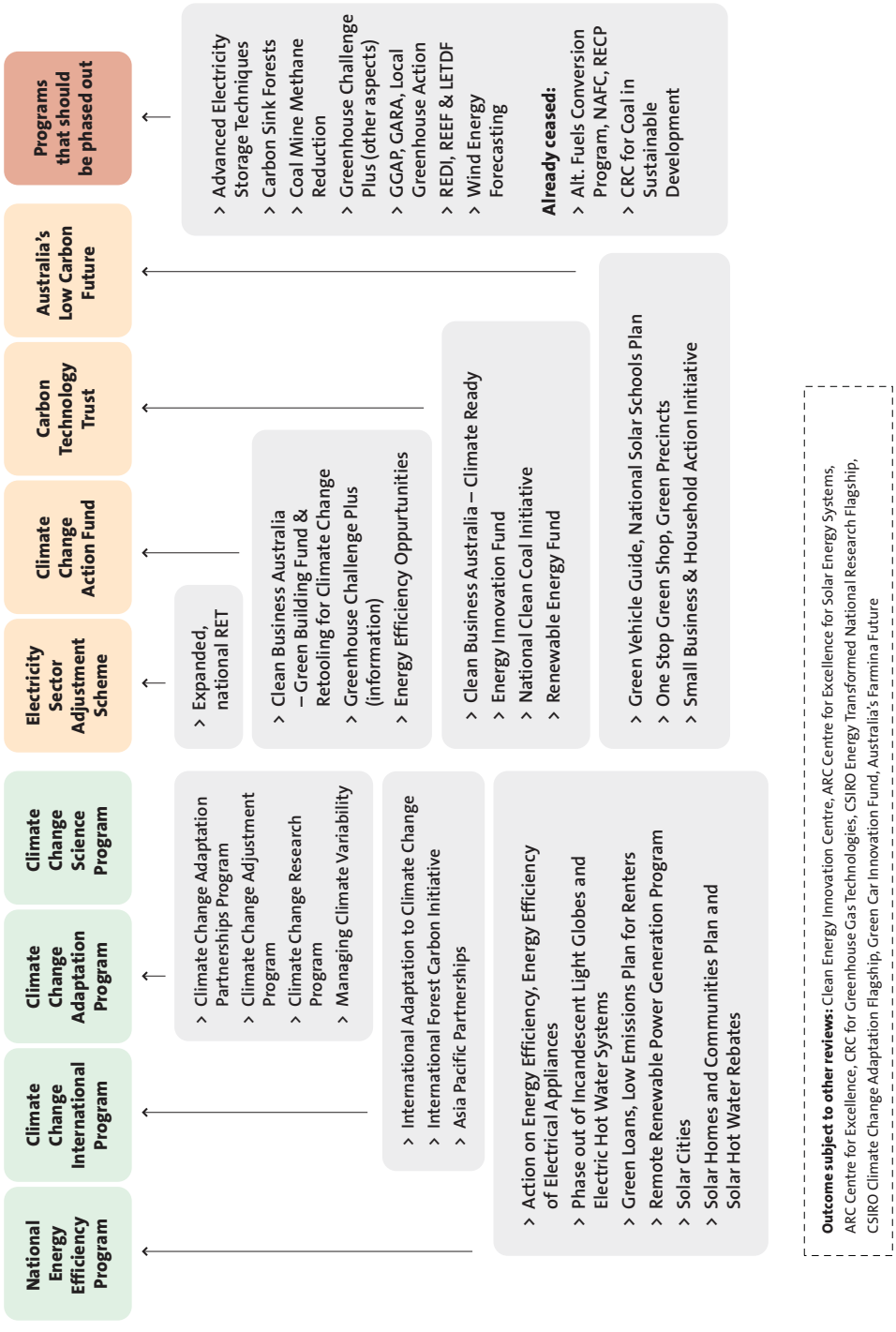


Figure 2.3: Consolidation of existing programs



03

CHAPTER THREE: INSTITUTIONAL AND GOVERNANCE ARRANGEMENTS

Summary

This chapter canvasses the institutional and governance arrangements associated with adopting the Review's principles for complementary policies. It proposes a new intergovernmental agreement – a National Climate Change Compact – as a means of better coordinating national action on climate change. Such an agreement would enhance the process currently underway through the COAG to streamline existing climate change measures across jurisdictions.

This chapter also canvasses options for improving the Commonwealth's climate change policy development process and approach to its own emissions with a view to ensuring that both represent best practice.

3.1. Introduction

Confidence in the ETS is likely to be undermined if investors expect all jurisdictions to maintain or introduce mitigation measures in addition to the scheme. COAG recently agreed to streamline the plethora of climate change programs which currently exist across all jurisdictions in light of the introduction of the ETS. In this context, there is a need for all Australian governments to agree on what measures would be justified in addition to the ETS and which jurisdiction should undertake such measures.

The Review's proposed National Climate Change Compact is designed to address this issue and to provide a platform for expediting other national economic reforms, such as reform of national energy, transport and water markets, that will be essential to the effectiveness of the ETS.

Adopting the Review's principles for complementary policies as a framework for future policy making and avoiding the pitfalls and problems associated with many existing climate change programs will require changes to the Commonwealth's own internal decision making processes. The Review's suggestions centre on the role of the DCC and embedding the price of carbon in the assessment of policy proposals.

The Government, like businesses and households, is a consumer of energy and will therefore need to consider how to change its energy consumption patterns in light of the impact of a carbon price. Concepts such as carbon neutrality will not be useful in this regard; rather it is the notion of carbon productivity that will be important.

3.2. A nationally coordinated approach to climate change

The consequences of many jurisdictions pursuing the same or competing goals in the same policy space, whether it is climate change or some other area, is likely to lead to duplication, complexity, wasted resources and questionable results. Such a situation is not in the national interest. The introduction of an ETS creates both an opportunity, and an imperative, to exchange an inefficient and ineffective set of arrangements for a more sensible specialisation across different levels of government.

3.2.1. Roles and responsibilities

Principle 4 of the Review's principles for complementary policies proposes that climate change policy be developed on the understanding that mitigation is the responsibility of the Commonwealth and that all jurisdictions have a role in a nationally coordinated approach to adaptation. It also provides some broad guidance on how responsibility for a specific activity could be apportioned between jurisdictions where it does not fit clearly into either mitigation or adaptation – based around concepts common in the discussion of federal relations and the Government's commitment to minimising the compliance burden on business. This section discusses the motivation behind this principle in more detail.

3.2.1.1. Guiding concepts

The framework to be employed in deciding which level of government is best placed to intervene in relation to climate change is no different to that which applies to other policy issues where multiple jurisdictions have an interest.

The *benefit principle of expenditure* suggests that action should be taken by the jurisdiction within which the benefits are likely to accrue. If the benefit arising from the provision of a good or service in one state spills over to others, the benefit principle suggests that the highest level of Government should intervene. For example, national public goods such as defence should be provided by the Commonwealth.

This indicates that where the underlying problem or issue to be addressed exists at a national level or is common across a number of states, prima facie, the Commonwealth should be responsible for leading and coordinating action. Similarly, where the underlying problem or issue to be addressed is more dispersed or differs substantially across regions, then more localised action is likely to be justified, and individual States and Territories should lead and coordinate such action.

Under the *subsidiarity principle*[11], a good or service should be provided by the level of government closest to the region that will benefit from the service as it is best placed to discern the preferences and circumstances of the communities and is therefore more capable of assessing the efficient level of goods and services that need to be provided.

However, in a federation many goods and services will be most efficiently delivered through a national market (for example, energy, consumer goods and financial services). For national markets to operate efficiently they need to be subject to nationally consistent regulation. The Commonwealth will usually be the most appropriate level of government to provide this kind of regulatory framework.

The capacity for jurisdictions to control the policy levers associated with an issue or problem will also be relevant in determining which level of government is best placed to intervene.

- For example, the Commonwealth is largely responsible for the tax and social security systems. Where the desired outcome is a redistribution of income on social equity grounds, it is the Commonwealth who will be best placed to act.
- Alternatively, preventing development in areas likely to be adversely impacted by unavoidable climate change would be best dealt with under local planning laws.

11 Oats, 1999

Also relevant in this context is the desirability of minimising the compliance burden on businesses, and confusion for consumers, resulting from differing regulation across states. Therefore in considering which is the most appropriate jurisdiction to act, the need to minimise the compliance burden on business resulting from differing regulation across states should be taken into account.

3.2.1.2. Mitigation

Over time, all jurisdictions have come to a consensus that national action of climate change mitigation is required in the form of a national ETS.

- The National Emissions Trading Taskforce (NETT)[12] was formed by State and Territory governments to progress the development of emissions trading in the absence of Commonwealth interest in the idea. It was also State and Territory governments who originally drew up the terms of reference for the review being undertaken by Professor Garnaut.
- The 2007 Prime Minister's Task Group on Emissions Trading (TGET)[13] also recommended an emissions trading scheme.

Both the NETT and TGET reports recognised that to be effective, an ETS should be regulated by the Commonwealth and that there was unlikely to be a substantial role for state-based mitigation activities independent of that scheme. This reflects the global nature of the underlying problem.

Greenhouse emissions have impacts across countries and across time – reductions in one country's emissions will potentially benefit other countries more than itself. Australia's national emissions are a small percentage of those globally and are not directly related to the impacts of climate change that Australia is exposed to. That is why domestic action to reduce our own emissions, while important, will not be enough. Ultimately any real solution to climate change needs to be formed at an international level. This serves to highlight the limitations of state-based mitigation efforts – reductions in Victoria's emissions, for example, will not necessarily produce commensurate benefits for Victorians (or even Australians) in terms of reduced climate change impacts.

It is this feature of the problem which makes carbon a perfect commodity – it can be traded not just across States and Territories but across countries. A market for such a commodity should ideally be global, but in the interim any domestic scheme should be a national one that is regulated by the Commonwealth.

- Under the Australian Constitution, external affairs powers are vested in the Commonwealth. It is the Commonwealth who has the power to bind the nation to emissions reductions under current and future international agreements on climate change. This would seem to suggest that the Commonwealth should have sole responsibility for setting Australia's mitigation policy in accordance with its international obligations.

However, the recent history of climate change in Australia is one in which the Commonwealth was not willing to engage in a dialogue on mitigation. It was prepared to discuss an approach to adaptation, and COAG has developed a National Adaptation Framework (discussed further below and in Chapter 9). It is therefore not surprising that faced with a constituency keen to see action on climate change, the States and Territories instituted their own mitigation programs and policies.

12 NETT, 2007

13 TGET, 2007

The Rudd Government's commitment to introduce an ETS changes this dynamic. Commensurate with this, states and territories also need to change their behaviour to ensure that policy decisions do not undermine the ability of the ETS to deliver least-cost reductions in Australia's emissions.

3.2.1.3. Adaptation

Roles and responsibilities in relation to adaptation are more difficult to definitively divide between jurisdictions, as the impacts of climate change on Australia are expected to vary between regions and even within regions. Therefore the kind of actions that will be required in preparing for and responding to these impacts will be similarly varied. This has already been recognised in the COAG National Adaptation Framework.

3.2.2. Action across jurisdictions

All jurisdictions currently have policies and programs in place which purport to address climate change. A summary of climate change related activities across jurisdictions which the Review has been able to identify is provided at Attachment 3.A – overall the Review has counted over 200 separate policies and programs. While many have been introduced over time, these activities are now generally embedded in policy commitments announced in the past two years.

At present, climate change activities at the state level focus on issues or areas important to each jurisdiction. However, on closer inspection, the issues they seek to address are common across jurisdictions. Examples include improving energy efficiency through subsidies for households, and support for low emissions technology development demonstration projections, including carbon capture and storage.

There is considerable overlap between these programs and those being undertaken at a Commonwealth level. This is illustrated in Box 3.1 with subsidies available for the installation of a solar hot water system in Sydney.

A further area of duplication is in relation to renewable energy targets – one of the streams of work currently being progressed through COAG is the consolidation of all state-based and Commonwealth targets into a single scheme (the RET). While a national scheme makes more sense than the current situation, it would strictly be preferable for all such measures to be phased out in light of the introduction of emissions trading (see Chapter 7 for further details).

It would also be preferable not to introduce white certificate schemes and FITs for solar power, as some State governments are in the process of doing – like renewable energy targets they dictate how part of the national abatement task will be met potentially displacing lower cost abatement opportunities.

Box 3.1: Case study – subsidies for replacing an electric hot water system with a solar system in Sydney

Unit cost: Cost of a typical 302 litre solar hot water system from one supplier, including standard installation costs.*	$4,740
Rebates or support	
Commonwealth:	
› Rebate for eligible solar and heat pump systems in homes	$1,000
› Homeowner also receives Renewable Energy Certificates for the solar hot water system under the Mandatory Renewable Energy Target – for a 302 litre system, these are worth approximately $1,380. These can be 'assigned' to the hot water system retailer, reducing the cost of the system.	$1,380
› Green Loan will be available from July 2009 – maximum loan $10,000, means tested, cutting out at household income of $250,000, repaid at the maximum rate of 2 per cent of annual gross income, with a minimum of $300 to be repaid each year.	
NSW support:	
› Rebate of between $300 and $1,500 for new solar (or gas, or heat pump) systems replacing electric system are available. The rebates for a 302 litre gas system is $800.	$800
Total rebates	$3,180
Cost to household	$1,560

Source: Solarhart (available from www.solarhart.com.au – accessed on 18 June 2008).
** Costs in the case study are estimates to illustrate benefits available.*

Regulatory schemes like renewable energy targets and white certificate schemes are understandably attractive to State and Territory governments as they can often be implemented at a relatively low budgetary cost. However, as is discussed in more detail in Chapter 4, regulation can come at a very high economic cost – that is, when the impacts on the economy as a whole (such as compliance cost, the cost of resources being diverted to lower value uses) are taken into account.

The continued proliferation of such schemes has the potential to interfere with the efficient functioning of the ETS. Investors' confidence in the scheme as an indicator of the value of carbon will be undermined if there are strong perceptions they may be forced into taking a range of abatement activities that are of a different type at a higher cost than they would otherwise.

It would also be preferable for current state-based support for low emissions technologies to be coordinated at a national level. State-based support generally lacks scale and has the potential to distort investment decisions – for example, a demonstration project may be best undertaken in one state but subsidies offered by a different state government may result in the project occurring elsewhere.

Further, the benefits of, say, a breakthrough in CCS technology are likely to accrue to the nation as a whole. The Carbon Technology Trust – proposed in Chapter 6 – would provide a mechanism for State and Territory governments to continue to contribute to a more nationally coordinated investment in the development and demonstration of low emissions technologies, including CCS.

3.2.3. The current COAG process

At the December 2007 COAG meeting, all jurisdictions agreed to cooperate to achieve an effective national response to climate change which has at its centre a single national ETS[14]. COAG also agreed to adopt a nationally consistent set of climate change measures to support the ETS. In doing so, COAG acknowledged the benefits in reducing the confusion, overlap, duplication, and red-tape associated with the current proliferation of climate change programs across jurisdictions. Previous COAG decisions on climate change are outlined in Box 3.2.

Through the COAG Working Group on Climate Change and Water, jurisdictions are currently discussing a framework to assess what measures might be complementary to the ETS. While COAG is in the process of agreeing its own principles of complementarity, the Review understands that they are expected to be broadly aligned with the framework proposed by this Review – both are fundamentally concerned with market failures and sensible Government action to address them.

Just as this Review has found that many of the Commonwealth's current programs will be superseded by the ETS, it is expected that reviews of state-based programs would come to similar conclusions. There are however, a number of areas where State and Territory governments will need to retain and potentially expand their efforts – particularly in relation to energy consumption, infrastructure investments and adaptation.

- In many respects, the States and Territories will have a greater adjustment to make in relation to their own energy use than will the Commonwealth, since they operate schools, hospitals and other public facilities that, as a result of the ETS, will face higher energy prices and other incentives to reduce their energy use and emissions.
  - Both higher energy prices and the expected impacts of unavoidable climate change will need to be factored into future investments in public infrastructure (such as transport and housing).
- This further reinforces why it is in the interests of State and Territory governments and their constituencies, for the Commonwealth to be primarily responsible for mitigation policy – there will be even greater demands on the resources of State and Territory governments without adding or continuing programs that are unnecessarily duplicative.

14 COAG, Meeting Outcomes, 20 December 2007

Box 3.2: Key COAG decisions on climate change

10 February 2006: Adoption of Climate Change Action Plan.

14 July 2006: Reviewed progress in implementing Climate Change Action Plan; agreed on single energy and greenhouse gas emissions reporting system.

13 April 2007: Endorsed the National Adaptation Framework, welcomed establishment of Climate Change Adaptation Research Facility and CSIRO Adaptation Flagship, and agreed on technology roadmaps and to establish a mandatory national greenhouse gas emissions and energy reporting system.

20 December 2007: Established Working Group on Climate Change and Water, to ensure an effective national response to climate change, encompassing a:

- single national ETS incorporating State schemes;
- nationally-consistent set of climate change measures to support the ETS; and
- national cooperative approach to long-term adaptation to climate change.

26 March 2008: Acknowledged that climate change represents one of the greatest economic and environmental challenges of our age, stressed the urgency of the current work to bring together the different approaches on renewable energy targets to combine into one national scheme, and to consider options for a harmonised approach to renewable energy feed-in-tariffs. Confirmed commitment to cooperative concerted action to address climate change and agreed to finalise a comprehensive framework for addressing climate change. All issues to be considered at the October 2008 meeting.

3 July 2008: Noted progress on the climate change agenda, including development of the National Renewable Energy Target Scheme options for feed-in tariffs and measures to accelerate energy efficiency enhancements, extensive consultations being undertaken by the Commonwealth in relation to the Emissions Trading Scheme (ETS) and that all jurisdictions are assessing the complementarity of their existing climate change measures.

3.2.4. A National Climate Change Compact

The Review, therefore, proposes that all jurisdictions enter into a 'national compact' that articulates clear roles and responsibilities in relation to climate change. A National Climate Change Compact would operationalise the December 2007 COAG decision by providing a framework for jurisdictions to agree on a common agenda.

The proposed Compact would, at a minimum, contain the following elements:

- A statement acknowledging the challenge that climate change represents for Australia and the world and the importance of a nationally coordinated approach;
- Agreement that the Commonwealth will be responsible for:
  - establishing and maintaining the ETS and any associated schemes – such as the RET;

- establishing any complementary measures and ensuring such measures conform, in general terms, with the principles for complementary policies; and
- a single, national scheme for the reporting of emissions.

- A commitment by States and Territories to withdraw from policies or programs with the potential to undermine the ETS.
- A renewed commitment by all jurisdictions to progress the COAG National Adaptation Framework and develop a national science agenda.
- A national approach to energy efficiency and low emissions technology development.
- A commitment to expedite progress on national reform priorities which are necessary to underpin the effectiveness of the ETS, such as the reform of national energy, transport and water markets.

While these provisions would make up the core of the agreement, the Review is separately proposing a number of other new institutions or initiatives that could potentially be brought within the Compact's scope.

- The Compact could include an agreement that the Commonwealth will establish a Carbon Technology Trust (see Chapter 6) and agreement that State and Territory governments will redirect existing support for low emissions technology development and demonstration to the Trust.
- The Review is also proposing a national strategy on energy efficiency measures (see Chapter 5) – the Compact could be the catalyst for such an approach by both referring to it and setting a deadline for its development.
- The creation of a National Adaptation Advisory Board to advise COAG on adaptation priorities and actions, as proposed in Chapter 9, could also be brought within the Compact.
- The ratification of the Compact by all jurisdictions could provide a launching pad for a broader Government information campaign on the ETS and climate change more generally (as discussed in Chapter 4).

To instil greater confidence in investors and the community that the Compact will be effective, all jurisdictions could agree to refer policies and programs with the potential to undermine or impact on the ETS to an independent expert panel (the 'ETS panel') for advice on whether they comply with the terms of the Compact.

- Under its Climate Change Bill, the United Kingdom intends to establish a Committee on Climate Change – an independent expert panel – to provide the Government with advice on emissions reductions targets, the use of a cap-and-trade scheme and other measures. Depending on the approach the Commonwealth chooses to take to set future short-term caps and longer-term targets under the ETS, the Review sees merit in the idea of establishing a similar entity for Australia which could take on the role of the ETS panel under the Compact.
- If such a body is not established by the Commonwealth, then an existing independent advisory body such as the Productivity Commission could be used for this purpose.

To further reinforce its commitment to cooperative federalism, the Compact could also note the Commonwealth's intention to take a leading role in the development of an international agreement and agree that the Commonwealth will consult the States and Territories in relation to Australia's obligations under any such agreement.

A draft Compact which the Commonwealth could use as a basis for discussions with the States and Territories is provided at Attachment 3.B – it contains both the core and additional elements outlined above. The most significant risk involved in such discussions will be the willingness of State and Territory governments to:

- cede responsibility on mitigation to the Commonwealth – an area where their constituencies have been demanding action; and
- acknowledge the effort that will be required on their part in relation to adaptation which presents a potentially large cost to them in budgetary terms.

The inclusion of references to broader economic reforms that should be expedited in light of the ETS – particularly energy market reform – may also be controversial.

In this context, the Commonwealth may like to consider what incentives – potentially in the form of payments similar to those attached to national competition policy reform or national partnership payments – could be offered to State and Territory governments to secure their support for the Compact. Any incentives would reflect the broader benefits to the economy of structural reforms (for example in energy markets) and reducing business compliance costs.

Recommendation 3.1

The Commonwealth Government should seek the agreement of State and Territory governments to a National Climate Change Compact to clarify roles and responsibilities that would include:

- *A statement acknowledging the challenge that climate change represents for Australia and the world and the importance of a nationally coordinated approach;*
- *Agreement that the Commonwealth will be responsible for:*
  - *establishing and maintaining the ETS and any associated schemes, including the national expanded Renewable Energy Target;*
  - *establishing any complementary mitigation measures and ensuring such measures conform, in general terms, with the principles for complementary policies; and*
  - *a single, national scheme for the reporting of emissions.*
- *A commitment by States and Territories to withdraw from policies or programs with the potential to undermine the ETS.*
- *A renewed commitment by all jurisdictions to progress the COAG National Adaptation Framework and develop a national science agenda.*
- *A national approach to energy efficiency and low emissions technology development.*
- *A commitment to expedite progress on national reform priorities which are necessary to underpin the effectiveness of the ETS, such as the reform of national energy, transport and water markets.*

Attachment 3.B outlines a suggested approach to the Compact.

3.3. Ensuring best practice policy development

The Government has an ambitious climate change policy agenda, and this needs to be sufficiently reflected in the institutional arrangements that support government decision making. In particular there would be merit in ensuring that accountability and responsibility is clearly assigned and there is sufficient coordination and coherency in approach. Just as the proliferation of climate change programs needs to be managed at a state level, the same applies at the Commonwealth level.

3.3.1. Departmental responsibilities

In Chapter 2, the Review proposed that existing Commonwealth programs be streamlined into a set of eight complementary programs. This process would also provide an opportunity to consider the allocation of responsibilities for both developing climate change related policy and administering programs.

DCC was established within the Prime Minister's portfolio with responsibility for policy and programs on mitigation – focussing on emissions trading and the RET – adaptation, climate change science and international negotiations. However, the delivery of other climate change programs and policy responsibility for issues such as energy efficiency remain devolved across a number of agencies.

- At present, climate change related programs are delivered by at least six departments (RET, DCC, DEWHA, DIISR, DAFF and the Australian Taxation Office); and four research and other institutions (the CSIRO, Bureau of Meteorology, Australian Research Council and RDCs).

The Review recommends that accountability for climate change measures at the Commonwealth level be centralised in DCC. This would ensure that climate change action is sufficiently coordinated and would guard against any future proliferation of programs. It should also reduce complexity and red tape.

There are two options that the Government might wish to consider:

- centralising policy functions under the Minister for Climate Change and DCC, with Ministers and agencies delivering the administered programs; or
- centralising both policy and program delivery in one Minister and agency.

Recognising the logistics involved in pursuing either option, achieving centralised policy functions may be the most pragmatic approach in the first instance. This would include appropriating funding to DCC for it to then make arrangements with other departments around the administration of the programs.

There are a range of benefits and limitations associated with either model. Greater centralisation could help to ensure future policies and programs are designed to support the ETS – that is, having a single agency responsible for the scheme and additional measures should help to avoid conflict between the two. It could also facilitate DCC to be sufficiently involved in consideration of policy options with the potential to impact on the ETS.

That is, rather than having a range of agencies that need to be involved whenever climate change is an issue, there would be a single agency to be consulted. However, the success of this approach depends on DCC building and retaining a body of relevant expertise and development of a departmental culture that promotes independent thinking and advice and guards against constituency capture.

Continuation of a more devolved structure is also not without its advantages. Having a range of agencies involved in a policy area acts as a check against agencies that, for a variety of reasons, become too aligned with the constituency of the programs they deliver. A variety of perspectives can also add value to the policy development process.

> The Review's recommendations in relation to individual programs or this discussion of future departmental structures should not be interpreted as a reflection on the professionalism and expertise of the relevant department officials.

However, it does require one agency to be clearly empowered by the Government to coordinate its climate change policy and program delivery across agencies. To be successful, relevant agencies also need to be willing to work together constructively.

The diagram at Attachment 3.C demonstrates what both options could look like.

Based on its observations and reflections, the Review considers that greater centralisation would be preferable to the continuation of the current approach. However, the decision is largely one to be taken on balance based on the Government's preferences.

Recommendation 3.2

The Government should consider centralising responsibility for developing, coordinating and implementing its climate change policies and programs and advising the Government on the climate change implications of other policy decisions in one department – the Department of Climate Change.

3.3.2. Decision making tools

Independent of the departmental structure chosen, there will be a need to embed climate change into the Government's decision making processes. There will be few areas that are not impacted by climate change in some way and some areas – such as the regulation of energy markets – will potentially have a significant impact on the effectiveness of the ETS.

It will be important to ensure that sufficient coordination mechanisms are in place, and this will probably require some form of discipline to be imposed.

The creation of a Climate Change Committee of Cabinet and various senior interdepartmental committees on climate change are a useful first step and should be retained. However, there are some other decision making tools which the Government may find useful.

3.3.2.1. Climate change impact statement

As part of the architecture for ensuring sufficient consideration of the implications of Government decisions on the ETS and carbon market more generally, all proposals that come forward for Cabinet consideration could be required to include a climate change impact statement. This statement would effectively operationalise the Review's principles for complementary policies.

To minimise red tape and ensure that only significant measures were subject to a full impact statement, a two-step process could be adopted. First, all agencies that wished to bring forward a submission would complete a short questionnaire that would identify whether there are significant implications for the Government's climate change response flowing from the proposal. For example, the questionnaire could include the following:

- Would the proposal impact on greenhouse gas emissions or adaptation to unavoidable climate change or Australia's international position on climate change?
- Would the proposal impact on demand or supply of energy (that is, would it impact on national energy markets)?
- Would the proposal impact on demand or supply of fuel (that is, would it impact on national fuel markets)?
- Would the proposal impact on information that would be used by consumers or suppliers of carbon, energy (including electricity) or fuel?

If the answer to any questions was yes, then the agency would need to consult with DCC to work out the extent and nature of any issues and whether further work and consultation was required. If the answer was no, then DCC would not need to be involved.

As with any form of regulation, there is a risk that such a requirement would encourage 'black letter' compliance as an after thought rather than a more rigorous policy development process. The capacity of central agencies – particularly PM&C, through its Cabinet Secretariat – to enforce the requirement for a climate change impact statement would also be crucial to its success.

An alternative to such an approach would be to amend the templates used to present new policy proposals in the annual budget process to include a section on climate change issues, if any. While this may have similar limitations to a climate change impact statement, it would arguably be less burdensome as agencies would not necessarily be required to agree their climate change assessment with DCC (although DCC would play some quality assurance role).

Further, both during the annual budget process or outside of that process, proposals which are thought to directly affect the ETS could require the co-sponsorship of the Minister for Climate Change (similar to the requirement that currently exists around taxation matters which requires the Treasurer's co-sponsorship or agreement).

The Review suggests that PM&C and DCC work together to provide the Government with further advice on which of these options, or any other alternative approaches, would be most helpful.

Recommendation 3.3

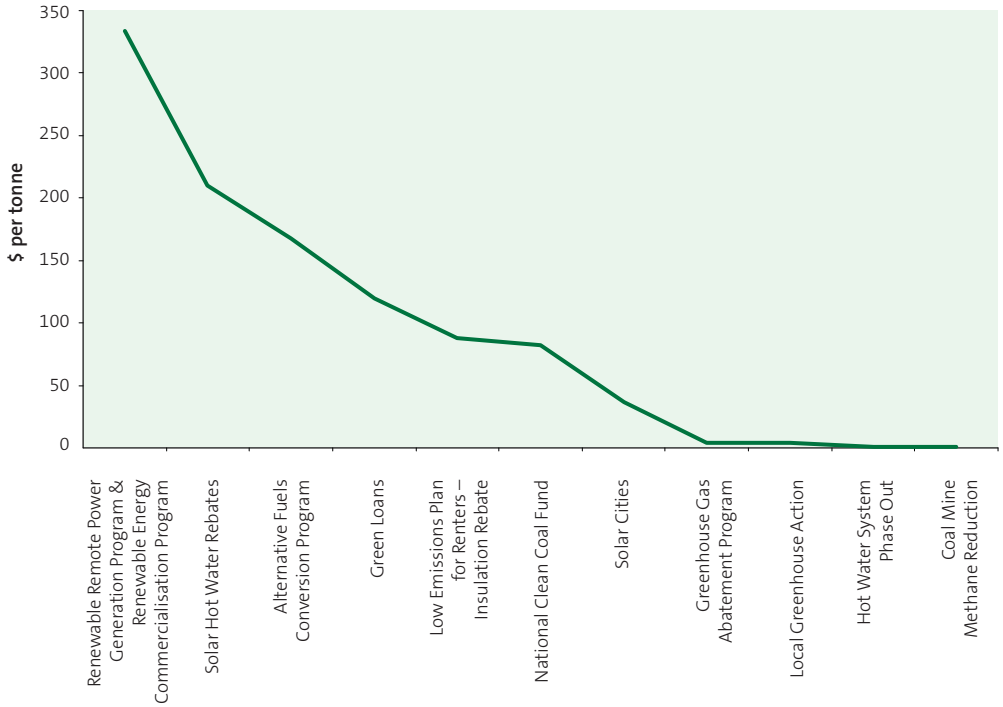
The Departments of Prime Minister and Cabinet and Climate Change should develop a mechanism for ensuring that Cabinet is informed of the potential for policy proposals to impact on the ETS, and that any such impacts are sufficiently taken into account in the policy development and decision making process.

3.3.2.2. Carbon abatement cost estimates

A key component of a climate change impact statement, or any other alternative process, would be an estimate of the carbon abatement cost implicit in the measure being proposed – as required by the Review's principles for complementary policies (principle 1). It will therefore be necessary for DCC to be tasked, and appropriately resourced, with developing appropriately robust measures of the carbon abatement cost implicit in different measures.

In broad terms, there are two approaches to calculating a proposal's implicit carbon abatement cost – a partial, 'back of the envelope' calculation such as fiscal cost effectiveness, calculated as government outlays per tonne of abatement, or a calculation of the wider economic welfare costs (such as measured by forgone consumption or Gross Domestic Product) that reflects overall cost to the economy per tonne of abatement (measured in relation to emissions in a business as usual scenario). Partial measures are less robust but easier to calculate. Further, measures of the cost per tonne of abatement derived using different methodologies and assumptions are also not necessarily comparable.

Figure 3.1: Average fiscal cost per tonne of abatement (to 2020) for selected programs



Source: Abatement data sourced from Department of Climate Change, 2008.

Figure 3.1 provides illustrative estimates of the fiscal cost per tonne of emissions abated from a range of climate change programs. These represent partial measures of cost effectiveness, similar to those in the cost of abatement curve recently released by McKinsey and Company (2007). The curve illustrates the cost effectiveness of different programs accounting for their expected emissions over the period to 2020 (which reflects anticipated abatement beyond the conclusion of the program funding).

It can be seen from Figure 3.1 that subsidy and rebate programs, such as RRPGP, are very expensive ways to reduce emissions. However, Figure 3.1 only represents the cost to the government (i.e. the fiscal cost) of achieving a tonne of abatement under certain programs, not the wider economic cost, which may be higher or lower for different programs.

- It is also important to note that the calculation does not take account of outcomes that may involve medium to long term or direct abatement, such as industry development or achieving economies of scale.
- Nevertheless, it provides an example of the information which the Review considers would be useful in assessing the relative merits of particular policy approaches.

While a number of practical issues will need to be resolved in the development of appropriate methods, similar concerns and limitations existed in the early days of regulatory impact statements which now play a useful role in decision making across jurisdictions. The Review is therefore confident that over time methodologies and techniques in this area can be improved. As the first step, the Review suggests DCC develop a consistent methodology for estimating the carbon abatement cost implicit in new climate change policy proposals.

Recommendation 3.4

The Department of Climate Change should develop a methodology for estimating the carbon abatement cost implicit in new climate change policy proposals, to inform consideration of their relative merits.

3.4. Managing the Commonwealth's carbon footprint

In addition to being responsible for imposing the ETS, the Commonwealth will also be affected through its consumption of energy (through a variety of means). The Government's energy consumption choices are also likely to be even more closely scrutinised following the scheme's introduction.

- The Government made a number of election commitments related to energy use in Commonwealth operations. These include a five star National Australia Built Environment Rating System energy rating for new Commonwealth office buildings and leases, requiring agency energy and water audits, and use of renewable energy for Parliament House and electorate offices. The Review understands that options for implementing these commitments are currently being considered.

Decision making around the Commonwealth's carbon footprint should not be an onerous add-on to the operation of departments and agencies, it should be integrated into existing business planning processes. This is the same adjustment to 'business as usual' which the private sector will need to make. Adherence to concepts such as 'carbon neutrality' will be unhelpful in this area – what is actually required is a significant improvement in 'carbon productivity' as part of an ongoing process of improving overall business productivity.

- This is essentially what the Government's EEO program has sought to do for businesses. Participation in EEO is mandatory for corporations that use more than 0.5 petajoules (PJ) of energy per year, which is approximately equivalent to the energy used by 10,000 households (around $5-$10 million in electricity).
- EEO's objectives of improving the identification, evaluation and public reporting of energy efficiency opportunities by large energy using businesses and to increase the uptake of the opportunities that are cost effective, are in line with the Commonwealth's current requirements around 'green procurement' (see Attachment 3.D).

On this basis, the Review considers that there would be merit in the Commonwealth extending the requirements of EEO to itself – this could be done as a matter of policy rather than requiring changes to the EEO legislation. The aim would be to build consideration of energy efficiency opportunities into everyday business planning. The result should be increased awareness of potential savings to be achieved from investing in energy efficiency improvements. Departments may then be able to develop sound business cases for investments that would yield energy savings on a commercial basis.

There is also merit in encouraging State and Territory governments to also apply EEO to their operations. This would send a powerful message to the community and business sector that governments are leading by example. It would also provide for national measurement of performance against a common approach.

There are also a range of activities which agencies could undertake to reduce their emissions and some may not suit all agencies. Examples include:

- arrangements to enable staff to work from home, teleconferencing and e-government could be explored to reduce transport emissions; and
- the Government's use of office space – both as a tenant and landlord. Governments could require the highest standard of energy efficiency in buildings it lets and leases.

To facilitate agencies undertaking such actions, options may need to be considered to address the up-front capital and other costs involved. These could include the Commonwealth establishing a revolving fund, or possibly agencies retaining savings achieved as a result of energy efficiency actions. A long-term approach, rather than an annual budget cycle one, needs to be taken to avoid perverse outcomes.

Recommendation 3.5

The Commonwealth should apply Energy Efficiency Operations framework to its own operations, and encourage State and Territory governments to adopt a similar approach.

3.5. Conclusion

The introduction of an ETS represents a fundamental change in Australia's approach to reducing its greenhouse emissions. To be most effective, it must be accompanied by a step change in the way all Australian governments approach climate change policy.

The Review's proposed National Climate Change Compact would demonstrate the ability of the Commonwealth, States and Territories to work together in a coordinated manner on an area of national importance. A clear assignment of roles and responsibilities would assist in streamlining existing climate change programs through the current COAG process and would also help to reinforce the credibility of the ETS.

Policy making at a Commonwealth level will also require a clearer assignment of departmental responsibilities and decision making tools to ensure climate change is given appropriate consideration. As the entity imposing emissions trading it will be important that the Commonwealth's own energy consumption decisions represent best practice.

Attachment 3.A: Climate change measures across jurisdictions

The table below summarises the results of a desk top survey of information available on the internet of climate change related measures across all Australian jurisdictions. It is not necessarily comprehensive. Programs and activities have been categorised under program categories used for the Review. The categorisation is indicative and may not necessarily capture well programs with more than one objective. The purpose of the table is to highlight the breadth of activity across jurisdictions, and resulting overlap and duplication. As at 26 July 2008 the review has counted in excess of 200 state and territory climate change measures.

Framework

Jurisdiction	Program
Commonwealth	Carbon Pollution Reduction Scheme – Green Paper 2007 election commitments Post 2007 election policy statements
ACT	Weathering the Change – The ACT Climate Change Strategy 2007–2025
NSW	NSW Greenhouse Plan – 2005-2008 State Plan – A New Direction for NSW 2006 Sydney Metropolitan Strategy
Victoria	Our Environment, Our Future – Sustainability Action Statement 2006 Responding to the challenge of climate change
Queensland	*ClimateSmart 2050* (under review) Premier's Council on Climate Change
Western Australia	Climate Change: Making Decisions for the Future
South Australia	South Australia's Strategic Plan Tackling Climate Change: South Australia's Greenhouse Strategy 2007–2020 Tackling Climate Change: Government Action Plan
Tasmania	Draft Climate Change Strategy for Tasmania, 2006
Northern Territory	Discussion Paper on NT Climate Change Issues NT Climate Change Focus Group Strategy for Greenhouse Action 2006

Abatement

Jurisdiction	Program
Commonwealth	Coal Mine Methane Reduction Greenhouse Action in Regional Australia Greenhouse Challenge Plus (including GES and GF) Greenhouse Gas Abatement Program (GGAP) Hot Water System Phase Out Low Emissions Technology and Abatement Emissions Measurement and Analysis Carbon Dioxide Capture and Geological Storage – Offshore Regulatory Framework Strategic National Response Carbon Sink Forests National Greenhouse and Energy Reporting Scheme
ACT	Apply NSW GGAS, and NSW Renewable Energy Target
NSW	Greenhouse Gas Reduction Scheme Rebates for replacing electric hot water systems (with gas, solar, heat pump) Identify sites for CCS (under Exploration NSW, New Frontiers initiative) Clean Fleet Voluntary Green Registration Scheme (offsets)
Victoria	Energy Technology and Innovation Strategy Greenhouse Challenge for Energy Greenhouse Regional Partnerships program
Queensland	*ClimateSmart 2050*: Identification of carbon capture and storage sites Queensland Gas Scheme Develop a Carbon Offsets Policy Offset all government air travel (from December 2007)
Western Australia	Landfill gas capture Carbon sequestration framework Demonstration of carbon sequestration
South Australia	Carbon Neutral Government
Tasmania	Sustainable plantation management for carbon sequestration Permanent Native Forest Estate Policy Forest Practice Codes RFA – Tasmanian Community Forest Agreement

Adaptation and science

Jurisdiction	Program
Commonwealth	CSIRO Prediction and Adaptation Flagship Climate Change Adaptation Program Climate Change Adaptation Partnerships Program Climate Change Productivity Research Program Climate Change Science Program Managing Climate Variability National Climate Change Adaptation Program
ACT	Climate change social impact analysis Prepare ACT and Region Vulnerability Assessment
NSW	Climate Change Impacts and Adaptation Research Program Greenhouse Innovation Fund Adaptation Capacity Building for Farmers Adaptation tools for Farmers Soil and Forestry Carbon Research Managing Bushfire Risk in a Changing World Forests NSW Carbon Accounting Increasing Soil Carbon Sequestration of Agricultural Soils by Better Managing Pastures Centre for Environmental Risk Management of Bushfires Climate Action – Wildlife habitats and corridors community conservation project Increasing NSW farmers' and rural communities preparedness for climate change
Victoria	Action Agenda on Climate Change and Greenhouse – Growing Sustainable Primary Industries National Centre for Sustainability Ministerial Reference Council for Climate Change Adaptation Agriculture Adaptation and Climate Change Initiative Future Coasts: preparing Victoria's coasts for climate change Preparing for climate change in regional Victoria Centre of Research Excellence in Climate Change Adaptation
Queensland	Climate Change Centre of Excellence ClimateSmart Adaptation 2007–2012
South Australia	Climate Change Chair, University of Adelaide NRM Research Alliance Adaptation measures: including research, planning, tools, information Urban Forests River Murray Forest Park Forest Property Act 2000: carbon rights, biosequestration State Natural resources Management plan 2006
Tasmania	Research and modelling of changing rainfall, land use, coastal zone impacts
Northern Territory	Savannah fire research and management – potential for offsets

Energy Efficiency

Jurisdiction	Program
Commonwealth	One Stop Green Shop Green Vehicle Guide Energy Efficiency Opportunities Green Loans Low Emissions Plan for Renters – Insulation Rebate Solar Cities and Green Precincts Action on Energy Efficiency Energy Efficiency of Electrical Appliances Phase out inefficient light globes Local Greenhouse Action Small Business and Household Action Initiative
ACT	Differential stamp duty for low emission vehicles Energy Efficiency Fund for government agencies ACT home energy audits – and home energy efficiency rebates Energy efficient street lamps Solar Hot Water Rebate Carbon neutral government buildings policy Stamp duty concessions for low emissions vehicles Energy efficiency improvements for government housing
NSW	Building and Sustainability Index NABERS: National Australian Built Environment Rating System BASIX: Building Sustainability Index Energy Efficiency Strategy Energy Savings Fund and Action Plans Rail Clearways Program School Energy Efficiency Program Cleaner NSW Government Fleet program Energy Smart Energy Smart Allies Directory Government Energy Efficiency Investment Program (GEEIP) Government agencies required to purchase green power (minimum 6%) Greenhouse Innovation Fund initiatives Sustainability Compacts Sustainable Procurement Program Retrofitting Properties Climate Change Fund: › Energy and water efficient appliance rebates – including solar hot water › Public Facilities Program – energy and water savings projects in state and local government, education and other facilities › NSW Green Business Program

Jurisdiction	Program
Victoria	Energy Efficiency For Victoria – Action Plan Government energy efficiency and greenhouse gas emissions reduction targets EPA Industry Greenhouse Program Smarter Energy Initiatives for Victorian Manufacturing 5 Star energy rating for new homes Environment and Resource Efficiency Plans Our Environment Our Future: Sustainability Action Statement 2006 GreenHomes Travel Smart (Commonwealth funded program) Black Balloons: community awareness energy efficiency campaign Sustainable Development of Transit Cities Victorian Government fleet offsets purchase High efficiency gas heater rebates Insulation Rebate
Queensland	Climate Change Fund Queensland Government Sustainable Energy Innovation Fund Smart Energy Saving Program (*ClimateSmart 2050*) Smart Energy Savings Fund Energy Choices Program 4 Star building standards Sustainable Housing Regulation Strategic Energy Efficiency Policy for government buildings Carbon Neutral Government Office Buildings Climate Smart Homes Rebates Home EnergyWise Tools Climate Smart Living (education) Ecologically sustainable transport Phase out of electric hot water systems
Western Australia	Mandatory Energy Efficiency Program (large energy users) Emissions reduction Strategies for key sectors 5 Star Plus building standards for new homes Government carbon neutral vehicle fleet Household sustainability audits Living Smart, TravelSmart Expanded public transport system and bike paths Rebates for energy saving products in off grid areas Smart Meters (for new electricity meter installations) Sustainable energy information programs and grants Energy Smart Government Reach for the Stars: promotes manufacture of energy efficient products

Jurisdiction	Program
South Australia	5 Star rating for new homes Reduce government energy used Convert 50 per cent of government cars to low emission fuels Green Star rating tool: 5 star for new government offices Solar Hot Water Rebates Greenhouse performance standard for water heaters Residential Energy Efficiency Scheme Climate Change Community Awareness and Behaviour Change Program Climate Change and Greenhouse Emissions Reduction Act 2007 (voluntary sector agreements) Establish Sustainable Skills Development Program Climate Change Education Resource
Tasmania	Government Framework for Action Environment Challenge program: promoting individual lifestyle changes CleanBiz Program Carbon footprint Pilot program Sustainable Living Tasmania Hobart City Solar hot water rebates
Northern Territory	NT Government Energy Smart Buildings Policy NT Vehicle Fleet Efficiency Target Minimum energy efficiency requirements through building codes Cool Mob Program NT TravelSmart Solar Hot Water Rebate Scheme School Blitz Program (energy audits)

Industry development

Jurisdiction	Program
Commonwealth	Clean Business Australia – Green Building Fund Clean Energy Enterprise Connect Centre Climate Change Adjustment Program National Solar Schools Plan Renewable Remote Power Generation Program (RRPGP) Clean Business Australia – Retooling for Climate Change Green Car Innovation Fund Solar Homes and Communities Plan (PVRP) Solar Hot Water Rebates Renewable Energy Target – funding for ORER Wind Energy Forecasting Capability Mandatory Renewable Energy Target
ACT	CNG Bus Fleet replacement The Electricity Feed-in (Renewable Energy Premium) Act 2008
NSW	GreenPower Industry Partnership Program NSW Renewable Energy Target National Greenpower Accreditation Program
Victoria	VRET: Victorian Renewable Energy Target Meeting Our Transport Challenges Develop feed in tariff Victorian Biofuels Action Plan Hybrid Bus Trial Infrastructure Grant Program Transit Cities program Victorian Sustainable Schools Initiative Solar Hot Water System Rebate Wind Energy Development Act
Queensland	Renewable Energy Fund (*ClimateSmart 2050*) Renewable and Low Emission Energy Target (*ClimateSmart 2050*) Queensland Government Solar Bonus Scheme (solar feed-in tariff) Minimum fuel efficiency standards for government fleet Solar homes Program
Western Australia	Coal Futures Strategy Fuel cell bus trial Cleaner Energy Target Renewable Energy Target Subsidy for renewable energy production Solar Schools Solar Water Heater subsidy Government to purchase renewable energy Government Vehicle Fleet Strategy

Jurisdiction	Program
South Australia	Electricity (Feed-In Scheme-Solar Systems) Amendment Act 2008
Tasmania	Promote CNG/LNG and Biofuels Infrastructure Attraction and Facilitation Project Proposed renewable energy feed-in tariff
Northern Territory	Tourism Electricity Support Program Make the Switch initiative (in addition to RRPGP)

Technology development and demonstration

Jurisdiction	Program
Commonwealth	ARC Centre of Excellence for Solar Energy Systems ARC Centre of Excellence for Advanced Silicon Photovoltaics and Photonics CRC for Greenhouse Gas Technologies CSIRO Energy Transformed National Research Flagship Clean Business Australia – Climate Ready Energy Innovation Fund National Clean Coal Fund Renewable Energy Fund Low Emissions Technology Demonstration Fund (LETDF) Renewable Energy Development Initiative (REDI) Renewable Energy Equity Fund Advanced Electricity Storage Technologies Geothermal and Hydrogen Technology Roadmaps
NSW	Renewable Energy Development Fund Developing Clean Coal technologies: Geosequestration project, and 'ultra clean coal' demonstration project Innovation Pathways Geosequestration site survey
Victoria	Renewable Energy Action Plan Energy Technology Innovation Strategy Sustainable Energy Research and Development Grants Working with Victoria's automotive industry Renewable Energy Support Fund MoU with Clinton Foundation Government energy Efficiency and Greenhouse gas Emissions Reduction Targets 5 Star Rating for new Government office buildings (from 2007) Rebate for rural, regional and outer urban households to switch to natural gas
Queensland	Carbon capture and storage research and demonstration (under Future Growth Fund) Support for hydrogen fuel cell Aircare (reduce vehicle emissions) Geosequestration site survey

Jurisdiction	Program
Western Australia	Low Emissions Energy Development Fund Support Wind Farm development
South Australia	Grants to support geothermal energy Mini wind turbines for government offices Renewable Energy Centre of Excellence (TAFE) Geothermal Energy grants for research and projects
Tasmania	Hydrogen research, with University of Tasmania Upgrade existing hydro power stations Innovation, Commercialisation and Enterprise Grants

International

Jurisdiction	Program
Commonwealth	International Adaptation to Climate Change Initiative International Forest Carbon Initiative Asia Pacific Partnership on Clean Development and Climate (APP) International Climate Change Strategy
Queensland	Queensland – China Climate Change Fellowship Program
Western Australia	Indian Ocean Climate Initiative

Terminated pre-2008–09

Jurisdiction	Program
Commonwealth	CRC for Coal in Sustainable Development National Average Fuel Consumption Target Alternative Fuels Conversion Program Renewable Energy Commercialisation Program

Attachment 3.B: Draft National Climate Change Compact

Introduction

Leaders acknowledge that:

- climate change, both mitigation and adaptation, is the most significant long term issue confronting the world.
- it is critical that Australia should do its fair share in reducing carbon emissions and stabilising carbon in the atmosphere.
- Australia needs to systematically address the variety of issues and problems that confront our economy, society and environment in adapting the impacts of climate change.
- Australia has the capacity, and that it is in our national interest, to take a leadership role internationally and in the region to ensure that international agreements and programs are designed to be efficient, effective and equitable.

In relation to mitigation of carbon emissions, Leaders recognise that:

- the key initiative is the establishment of an emissions trading scheme;
- this market needs to be national and uniform if it is to work efficiently and effectively;
- confidence in, and the integrity of, the market require governments to undertake not to interfere in the market and not to instigate programs or policies that have the effect of distorting prices in the market.

In relation to adaptation to climate change, leaders recognise that:

- all levels of government may have significant roles and responsibilities;
- it is nonetheless important for government action to be well coordinated and to be subject to a disciplined assessment of the costs and benefits involved.

Accordingly, Leaders agree to abide by the following provisions.

1. **Mitigation**

    1.1. The Commonwealth Government and Parliament will be responsible for establishing and maintaining an emissions trading scheme and associated programs, including renewable energy targets and feed-in-tariffs.

    1.2. The States and Territories will withdraw from policies, programs or schemes that impact on the emissions trading scheme i.e. policies, programs or schemes that duplicate or could affect the price or cost of carbon or associated mitigation schemes.

1.3. Where complementary measures may be required, these measures will be undertaken by the Commonwealth or under a nationally agreed policy by all jurisdictions, not by the States and Territories unilaterally. These measures would generally conform to the principles set out at Appendix A [the Review's principles for complementary policies outlined in Chapter 1] and may include:

1.3.1. assistance for new technology;

1.3.2. provision of information to market participants; and

1.3.3. measures to advance energy efficiency.

1.4. To ensure that existing and future measures conform to 1.2 and 1.3, Leaders agree that before embarking on a measure that may affect the emissions trading scheme, the measure will be submitted to an expert panel [exact title to be specified] for an opinion as to whether or not it does conform with 1.2 and 1.3.

1.5. State and Territory leaders also agree to participate in the new Carbon Technology Trust being established by the Commonwealth to better assist new technologies to enter the market. [Details of the Trust would be set out in Appendix B to the agreement].

1.6. The Commonwealth agrees to preserve State and Territory laws that could affect the ETS and associated programs from potential invalidity for an interim period by placing those laws in a schedule to the Commonwealth Law creating the ETS and associated programs.

1.7. The Commonwealth, States and Territories will by 2009 agree to a national strategy for energy efficiency where measures will be uniform across Australia and will not interfere with the operation of the ETS.

1.8. The Commonwealth, States and Territories agree that all business reporting in relation to greenhouse emissions will occur under a single, nationally uniform scheme to be established and administered by the Commonwealth.

1.9. The Commonwealth, States and Territories agree that the Commonwealth will be primarily responsible for income support and equity programs and structural adjustment, where required as a result of the introduction of the ETS.

1.10. In light of their importance to the ability of the ETS to work effectively, all jurisdictions:

1.10.1 agree to expedite national energy market reform with priority being placed on the deregulation of retail energy markets and the roll out of smart meters, with substantial progress to be made by 2012; and

1.10.2 reaffirm their support for the development of a National Transport Plan and a national infrastructure plan that would include consideration of climate change impacts (both mitigation and adaptation) by 2010.

2. **Adaptation**

2.1. The Commonwealth, States and Territories recommitted to advance work under the National Adaptation Framework.

2.2. The Commonwealth, States and Territories also agreed to set up a specialist panel to advise COAG on:

2.2.1. priorities for action;

2.2.2. the relative merits of alternative policies and measures to address those priorities; and

2.2.3. the level or levels of government that should be responsible for action in each case.

2.3. The Commonwealth, States and Territories:

2.3.1 note the enormous potential variety of issues that might arise as a result of climate change

2.3.2. agree to notify each other and the specialist panel of issues arising; and

2.3.3. agree to consult on the manner in which such issues might be addressed with a view to similar issues being treated in a similar manner across all jurisdictions.

3. **International**

3.1. The Commonwealth intends to take a leading role in influencing the shape of a UN framework to govern international action on climate change post-2012.

3.2. The Commonwealth, States and Territories agree that the general approach would ideally create markets similar to the ETS that operate or link globally, and are as wide and deep as possible.

3.3. The Commonwealth agrees to continue to consult with the States and Territories in relation to those international negotiations.

Attachment 3.C: Proposed departmental structure

Figure 3.2: Proposed departmental structure – with greater centralisation

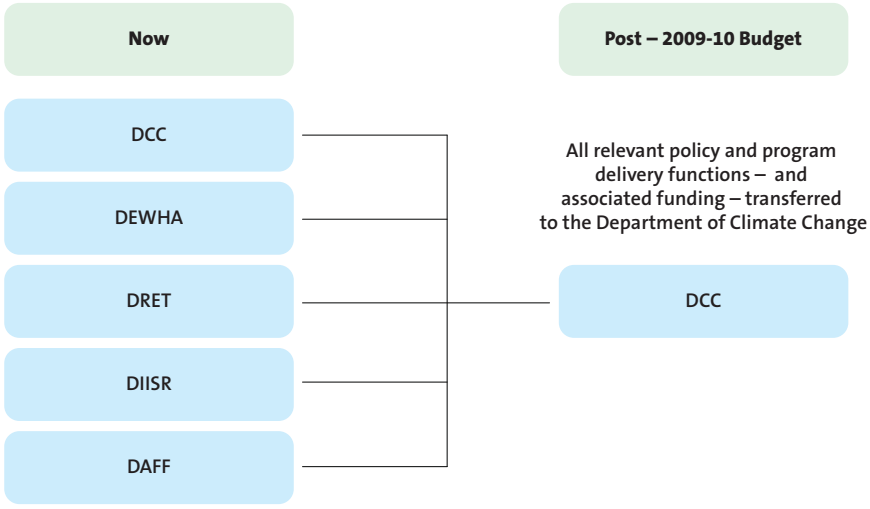
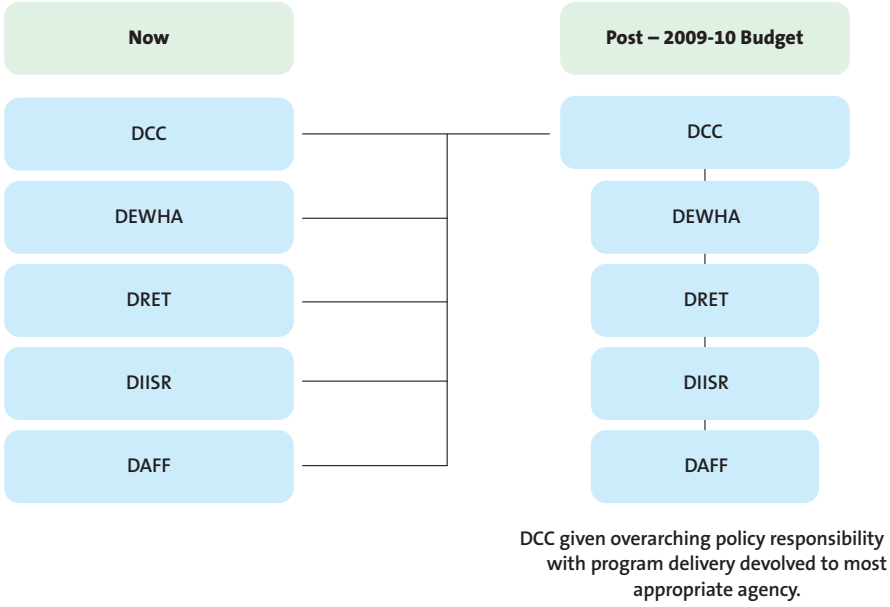


Figure 3.3: Proposed departmental structure – with greater coordination



Attachment 3.D: Government operations

The Commonwealth Procurement Guidelines are a governance framework around how agencies buy things, but they do not govern what agencies buy or how they use goods and services – this is left to the discretion of individual agencies.

- Commonwealth procurement arrangements are often suggested as a means to create demand for certain goods and services and to drive innovation. However, in a devolved environment, there may be significant transaction costs involved in trying to coordinate procurement activity that may outweigh any benefits.
  - Further, Australia may be constrained in using procurement policy as an industry development tool by its international obligations such as the US Free Trade Agreement.
- This does not mean that there are not things that the government can do through its purchasing to reduce its carbon footprint.

DEWHA provides a comprehensive set of policies and guidance around how agencies might consider environmental issues when undertaking procurement. These include:

- Energy Efficiency in Government Operations, involving annual reporting by agencies, portfolio energy intensity targets by 2011–12, and Minimum Energy Performance Standards for buildings, appliances and vehicles;
- Green Leases Schedules, with mutual obligations for tenants and landlords to achieve energy efficiency targets; and

In addition, Finance manages the government vehicle fleet, with vehicles either made in Australia or with an engine capacity of two litres or under and imported by an Australian vehicle manufacturer.

These policies interact with, and need to take account of, other policies and legislative requirements – a summary is provided in the table below. Agencies are to use best endeavours to meet these provisions.

The ANAO audited green office procurement in 2005[15]. Its findings indicated that improvements in whole of lifecycle costing and better management of environmental considerations in building business cases and procurement decisions could deliver financial savings. Further, compliance with the policies was very inconsistent, including due to agency budget constraints and in some cases inadequate internal processes.

The House of Representatives Standing Committee on Environment and Heritage considered the ANAO report as part of an inquiry it was conducting in 2006, and noted its concern with the 'shortcomings in government agencies' green procurement performances.'[16]

15 ANAO, 2005–06

16 House of Representatives, 2006

Policy References	Relationship with procurement
Green Office Guide	The Green Office Guide provides information for procurement officers on buying environmentally friendly office equipment and suggests agencies to consider giving preference to products and services identified as 'environmentally preferable' where quality, function and costs are equal or superior.
Environmental Purchasing Guide and Checklists	The Environmental Purchasing Guide provides guidance on how to include environmental issues in value for money decision making. Checklists cover key types of goods and services purchased by the Australian Government.
National Greenhouse Strategy Measures for Improving Energy Efficiency in Commonwealth Operations	Sets mandatory energy use targets for lights and power for new leases and major refurbishments in Government office buildings and stipulates that all new appliances have minimum energy ratings and power management features, and that agencies only purchase office equipment that complies with the US Environment Protection Agency Energy Star standard (where available and fit for purpose). Encourages purchasing which takes into account operating energy costs as well as capital costs.
National Government Waste Reduction and Purchasing Guidelines	Agencies are to adopt waste reduction and purchasing plans.
National Packaging Covenant	Outlines key actions to reduce the waste generation and environmental impacts of packaging (including packaging of goods purchased or produced by the Australian Government). Also encourages the purchase of recycled content products.
Environmental Protection and Biodiversity Conservation Act 1999	Specifies that agencies are to include information about their performance on Ecologically Sustainable Development principles (including procurement) in their annual reports.

Source: Finance, 2005, *Guidance on Complying with Legislation and Government Policy in Procurement*, Canberra

04

CHAPTER FOUR: INFORMATION

Summary

Information is critical to underpin the effective functioning of markets, including an ETS, and the ability of private agents to decide how to change their production and consumption choices. The Government has a range of tools at its disposal to facilitate informed decision making – particularly through standard setting and consumer protection laws. These will continue to be relevant in context of an ETS.

As with any economic reform, the Government also needs to explain to the community and to those directly affected by the ETS, how the scheme will work and what the effects are likely to be. Building greater community understanding of the ETS will be essential to the scheme's success in the long term.

4.1. Introduction

Information is critical to underpin the effective functioning of markets. Buyers need accurate and timely information about the availability and performance of products to make optimal choices. Suppliers need to know about the demand for their products and opportunities for bringing new products into the market. It is sometimes the case that one party has less information than the other or that both parties have incomplete information. In such cases there may be a role for the Government to intervene. This is why principle 1 of the Review's principles for complementary policies identifies information failure as one of a range of rationales that may justify government intervention in addition to the ETS.

The ETS will be a new and mysterious market to many people. There will be companies and citizens who will need to participate in it and a vast group of companies and individuals who will be affected by it through the price effects on goods and services they consume. All of these groups need to understand what the ETS is and how it works – at different levels of detail and for different reasons. This chapter explains in more detail issues around information failure in the context of an ETS and what Government action might be required.

4.2. Responses to information failure

The degree of the intervention required will depend on the nature of the underlying information failure. The costs of indentifying and accessing the kind of information an individual or business may need to make an 'optimal' choice may be too high for any individual to justify. Alternatively, the information an individual or business requires may simply not be available.

There are a range of ways in which the Government can intervene in response to information failure which, like any form of intervention, comes with a range of potential costs and benefits.

- Information provision by the Government is perhaps the least interventionist approach and done properly can be a cost effective means of solving an underlying problem.
- At the opposite end of the spectrum, the Government can, by use of its legislative powers, restrict the sale of goods and services that do not meet certain standards.
  - Such an approach can be effective in reducing transaction costs for individuals and businesses as they can all transact in the knowledge that what they are purchasing meets some minimum requirement.

- While often perceived as being low cost, particularly in terms of their budget impact, minimum standards for products can run the risk of violating the principle of consumer sovereignty – that individuals are the best judge of what maximises their utility.
- In imposing minimum standards, the Government needs to undertake robust analysis to ensure that the benefits to the economy as a whole outweigh the costs involved, including the costs to those individuals that would, quite rationally, have been satisfied with a product below that standard.

› Alternatively, between these two extremes, the Government can require that companies disclose certain information to their customers. This is effectively the role of consumer protection legislation – currently embodied in the *Trade Practices Act 1974* and some State legislation – and market disclosure requirements under the *Corporations Act 2001*.

4.3. Information and emissions trading

Recommendation 4.1

The Government should undertake a range of strategic actions to inform different sections of the public and the markets about climate change and the ETS. This would support:

› *managing expectations about the nature of the challenge which climate change represents for Australia, and about the impact of an ETS on the economy and community;*

› *build greater understanding of the roles and responsibilities of different levels of government;*

› *explain what individuals can do to meet the challenge; and*

› *ensure information is provided to ETS participants and others on what to expect from it.*

Like any market, information will play a crucial role in the functioning of the ETS. Three information streams will be particularly important.

› Climate change science will be a crucial input to setting emissions trajectories under the ETS (see Chapter 9).

› Emissions data from entities subject to the scheme will be a vital input to Government decisions about scheme caps and targets, and its disclosure will help to shape expectations about the difficulty of meeting those requirements (and therefore the value of the right to emit).
  - There is already a process in place to streamline the collection of emissions and energy data across all jurisdictions into a single National Greenhouse and Energy Reporting Scheme (NGERS).
  - The Review proposes that the National Climate Change Compact would reaffirm the commitment of all jurisdictions to having a single emissions reporting scheme to support the ETS and associated policies.

› Statements the Government makes about how it will approach changes to the scheme, and any related complementary measures, will help to shape expectations about the 'sovereign risk' associated with the scheme. The ability of the scheme to drive investment in long-lived assets will depend in large part on such expectations.

– The Government cannot provide absolute certainty about its future intentions, but it can provide clarity as to the circumstances and process under which future changes will be considered. The Review notes that this is an issue for the Government to resolve as part of its deliberations on scheme design.
– However, as discussed in Chapter 3, the National Climate Change Compact could be useful to the Government by sending a clear signal about roles and responsibilities. Further, the Government could attach the Review's proposed principles for complementary policies to the Compact to set clear limits on the scope of any policies in addition to an ETS.

4.3.1. Building community understanding

The introduction on an ETS has been described as an economic reform equal in significance to the moves towards trade liberalisation. Any economic reform of significance has been accompanied by a communications campaign to assist the community in understanding what is being undertaken and what the effects are likely, or intended, to be (the introduction of the GST is one example).

Recent public polls have demonstrated that community support for doing 'something about climate change' is high, but there is not yet a real understanding of what this will actually mean, especially in terms of higher prices for all carbon-intensive products, including fuel. This lack of understanding and acceptance has the potential to undermine the effectiveness of the ETS. Community concern and pressure for additional measures has significant potential to undermine an effective government response, and needs to be managed.

Therefore, at the earliest opportunity, the Government needs to begin a strategic information campaign to educate the community about emissions trading. Importantly, what is required is something more sophisticated than a short-term burst of television advertisements and glossy brochures. The information needs of different groups will need to be met in different ways and their needs will change over time. The Review considers that this is one of the major gaps in the Government's current approach.

4.3.1.1. Existing programs

Within the Government's current suite of programs, few are purely focussed on information provision. The Green Vehicle Guide appears to be the only initiative focussed purely on information provision by the Government. This website provides consumers with access to information about the fuel efficiency and emissions associated with a range of new motor vehicles and a means of comparing different alternatives. It does not require anything on the part of vehicle manufacturers, although much of the information provided builds on the fuel efficiency labelling requirements which the Government does mandate.

Other programs have had an information provision aspect to them – including Greenhouse Challenge Plus and the Small Business and Household Action Initiative. Further, the Review understands that the National Solar Schools Plan is expected to increasingly become focussed on information provision.

However, there is nothing which addresses the broader issue of communicating what the ETS is, how it will be effective in reducing Australia's emissions and how it fits within the Government's broader response to climate change. Funding a program of activities which tackles this need could be met from the savings realised from the termination of programs that the Review considers should not be continued in light of the ETS (as discussed in Chapter 2).

4.3.1.2. Strategic information campaign

Communicating about emissions trading – and the Government's response to climate change more broadly – is important to counteract exaggerated alarm about potential harm to certain groups.

The size of the reform is significant, but should not be overstated. An important message for the Government is that past microeconomic reforms have produced an economy that is more flexible and better able to adjust to changing circumstances. Further, just as there will be costs, there will also be opportunities that a skilled and mobile workforce will be able to exploit.

Figure 4.1: Potential information sources for businesses

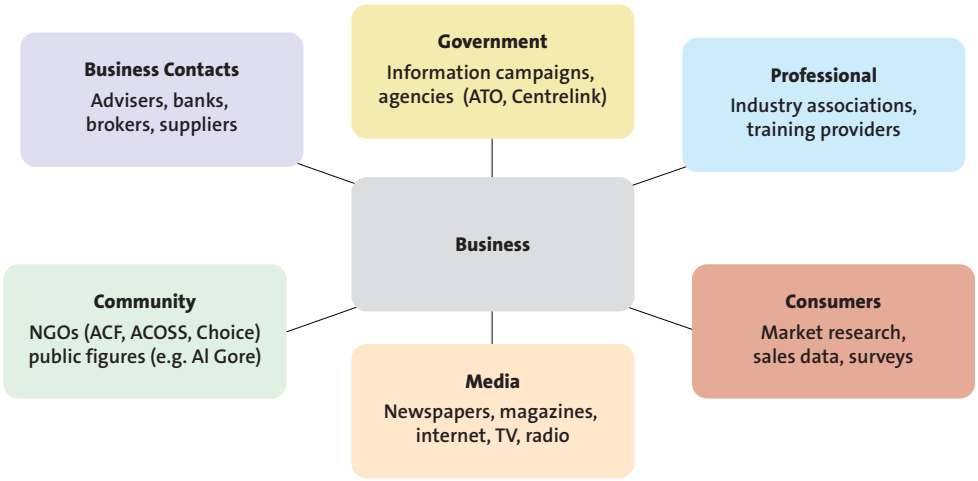


Figure 4.1 above is a highly stylised depiction of the sources of information for an Australian business. It serves to demonstrate that information provided directly by the Government is only one part of a much bigger picture. In trying to build understanding about something like the ETS, the Government needs to consider how it can use a variety at channels to promote greater understanding.

For example, through its ETS design consultations, the Government is already engaging with industry associations who will have an important role to play in helping to inform their membership about the scheme. The only action required of the Government may be to ensure that it provides such groups with clear and correct information that they can use in communicating with their members. Clear factual information from the Government could also provide a basis for information dissemination by other organisations, such as the Australian Consumers Association (Choice).

Figure 4.1 would look different if it were drawn for a specific kind of business or for low income households. Therefore the avenues available to the Government and the tools that might be used would vary depending on the target audience.

The role of public figures, such as Al Gore, Sir Nicholas Stern and Professor Garnaut, and other opinion makers in building community understanding and shaping opinions on climate change generally is already being felt. The open and transparent process being run by Professor Garnaut appears to be promoting more informed discussion and debate around emissions trading and Australia's response to climate change more generally.

The Government should look for opportunities to work through existing tools or campaigns. For example, the *understanding money* campaign run by the Financial Literacy Foundation could be augmented to include information about how to manage higher energy bills in terms of household budgeting and decisions such as purchasing a house or car. This kind of approach would help to reinforce that responding to climate change will involve a large number of small, everyday decisions by individuals.

Building climate change into school science and humanities curriculums could also play a useful role, not just in terms of educating children but also their parents through involvement in school projects and activities. In this respect, climate change and emissions trading is really no different to the kind of health education initiatives – such as those on smoking and alcohol – that have been implemented in the past. The greater use of electronic media – such as social networking websites – also offer a range of opportunities in disseminating information to specific groups in formats they find engaging.

4.3.1.3. Australia's Low Carbon Future Program

To tackle these issues, the Review is recommending that existing information programs be consolidated into one program, called Australia's Low Carbon Future. This program would encompass a range of targeted subprograms to inform and educate the community on:

- the nature and operation of emissions trading;
- the roles of different levels of government and what they are doing; and
- actions that can be taken by individuals, households, communities and businesses to reduce their emissions and to improve their use of energy.

More detail on this program is contained in Appendix 4. Resourcing would need to be determined in consultation with Finance.

4.4. Consumer protection

Recommendation 4.2

The Government should ensure that existing consumer protection infrastructure is ready to manage any issues that may arise from the ETS, such as false or misleading advertising or price gouging.

It is becoming increasingly popular for companies to highlight their 'green' credentials – either through their approach to their corporate functions or the production of goods and services. It is reasonable to expect that such practices will become more prevalent. The Australian Competition and Consumer Commission (ACCC) is to be commended for being pro-active in this area[17].

However, the need to prevent companies from engaging in misleading and deceptive conduct in relation to 'green' products is no different than in relation to other products. In the context of the ETS and the growing attention on climate change more generally, an increasing number of companies will be attempting to market the environmental credentials of their products. Enforcement agencies may, therefore, face an increase in cases of potentially misleading and deceptive conduct to be examined and prosecuted in this area and will need to be properly resourced to meet this challenge.

17 ACCC, 2008

Further, it will also be important that the Commonwealth, States and Territories work in concert on this issue – getting nine different approaches to what people can or cannot say about 'carbon neutrality', for example, would be worse than having none at all. In this regard, the Commonwealth's recent commitment to a national consumer policy framework articulated in a single piece of generic legislation is a welcome development[18].

The powers of the ACCC under the *Trade Practices Act 1974* will assist in ensuring that increases in prices following the introduction of the scheme can be examined appropriately. This will help address concerns that unscrupulous businesses will use the introduction of the scheme to unfairly profit at the expense of other businesses or households.

4.5. Standard setting

Standards and disclosure requirements are a critical aspect of the provision of information to consumers. However the degree to which the Government needs to be involved in this will vary according to the nature of the products or services being traded.

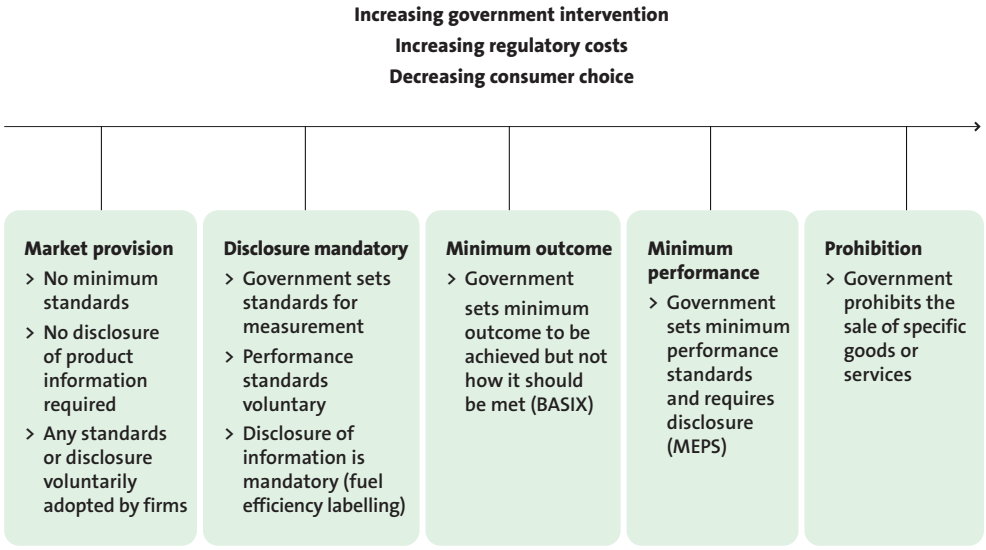
There are costs and negative aspects of standard setting that are often not well understood. It is often assumed that this kind of government intervention is benign and costless, because it does not involve large amounts of taxpayer's money.

- Costs for the private sector can be high if a standard for a particular product is set so high that it has to remove some of its products from the market or drastically change the products it offers for sale. Both the private sector and the government will incur significant compliance costs in such a situation.
- Further, this type of intervention denies people the opportunity to choose if certain products are removed from the market. In removing goods from the market below a certain standard, the Government will usually remove cheaper products from the market requiring consumers to pay more (even if they would have been satisfied with the sub-standard, lower cost product). There can, of course, be considerable benefits and savings that also need to be brought to account. Health warnings are an example of such a situation.
- Intervention of this type can also be high maintenance. Technology changes over time, sometimes rapidly, and so do community attitudes. Standards need to be kept up to date once they are established. In a federal system, this can be a prolonged and complex process, particularly when there is no real need for regulation across jurisdictions to differ (for example, because the products being regulated are identical).

In summary, standards and disclosure requirements can be viewed as a spectrum of actions that moves from less to more government intervention and level of prescription – as illustrated in Figure 4.2 below. In moving from less to more government intervention, increasing government regulation can reduce consumer choice and increase the cost associated with implementing, enforcing and maintaining standards.

18 Ministerial Council on Consumer Affairs, 2008

Figure 4.2: Standard setting



Governments have, and should continue to play, a role in setting standards for energy consumption or emissions associated with goods and services traded in Australia. However, the extent to which the Government should limit the availability of a particular good or service will require careful consideration on a case-by-base basis.

Governments already have techniques and protocols for testing the costs and benefits of regulatory intervention. There is no need to 'reinvent' this particular wheel, only to ensure that it is properly employed. However, there are a few features of climate change that are important in this context.

- If standard setting is pre-eminently an attempt to get abatement or emissions reduction, it should be possible to show that the implicit price of carbon in the regulatory proposal is lower than the price expected in the market. If it is not, then it does not make sense as an abatement measure.
- Psychology and behavioural economics also indicate that people do not always make 'optimal' choices. So, it may make sense to choose a less efficient product if transaction costs are too high for a relatively small payback. Or, consumers may prefer the short term gratification of the product with cheaper upfront costs over the long term gratification of lower ongoing energy bills. A consumer may not be prepared to invest more now for a bigger payback in the future. That is, upfront cost is only one input into the decision.

Technology is changing rapidly. Putting a price on carbon is likely to shift the supply curve radically. But that will take time. Consumer instincts to be reticent to buy 'early technology' may make sense. Especially, if consumers expect that the costs of technology will go down over time (for example, plasma TVs or computers).

A secondary market may also develop to facilitate upfront investment of capital to save money over time. In particular there will be incentives for financial institutions and suppliers to find ways of doing this as part of increasing their business and differentiating themselves from their competitors. However, this is likely to take time.

Recommendation 4.3

The Government will continue to have a role in setting and disclosing performance standards in relation to:

- *buildings (outcome standards);*
- *fuel and vehicle standards (minimum performance); and*
- *energy use in appliances and other products (minimum performance);*

but should only do so where a robust cost benefit analysis indicates that there is a net benefit to the economy from doing so. The presumption should be to adopt international standards in the first instance, unless there are compelling reasons not to do so.

Following the Review's principles for complementary policies, governments might have a case for intervention where it can be shown that:

- the implicit carbon price of a measure is lower than that in the market;
- there is some impediment or market failure such as high transaction costs that makes it difficult for a transaction to occur; and
- more generally, benefits outweigh costs – that is, Government intervention can eliminate that impediment at net benefit to society.

It will be possible for governments to make these sorts of cases for regulatory intervention. But importantly, such intervention rests on the premise that there is a strong case that the implicit price of carbon in the proposed regulation is better than the market price, but that for some reason the market is not working to deliver that outcome or will deliver that outcome slowly or imperfectly. Governments need to be disciplined about invoking this sort of argument. It is easy to contend that some technology is obviously bad and should be eliminated. Such an argument does not support the prescription that a particular sort of technology should be used or mandated.

4.6. Conclusion

Information has an important role to play in Australia's transformation to a low carbon economy. Like any market, information will be the driving force behind transactions in the ETS. The Government will also need to invest in ensuring that the community has a more comprehensive understanding of emissions trading than is currently the case, but the Government needs to be strategic in the way it goes about doing this.

Tools which the Government is already using to overcome information failure – particularly its consumer policy framework and standard setting – will continue to have a role in light of the ETS. The challenge will be to ensure that they are applied, and resourced, appropriately.

05

CHAPTER FIVE:
ENERGY EFFICIENCY

Summary

Improved energy efficiency across the economy will have a role to play in meeting the abatement task set by the ETS. In this context, measures which seek to 'accelerate' the take up of energy efficiency are inconsistent with a commitment to least cost abatement. However, it is well established that there are market failures which may act as barriers to the take up of energy efficiency opportunities that would otherwise be cost effective forms of abatement. This chapter discusses the role for the Government in energy efficiency following the introduction of a carbon price. While the Government's primary role will be in overcoming information failures, transitional broad-based financial assistance for households and businesses could also be justified.

5.1. Introduction

Energy efficiency is the maximisation of output for each unit of energy input. In many discussions of 'energy efficiency', the term is also used more broadly to encompass energy conservation, management of the demand for electricity and distributed (renewable) electricity generation. This chapter uses this broader meaning.

As a carbon intensive product, electricity is expected to become relatively more expensive following the introduction of the ETS. This will make energy efficiency opportunities more cost-effective than they are already. That is, energy efficiency will be one of the means of reducing Australia's emissions. There are expectations that energy efficiency will have a significant role to play in meeting the abatement task set by the scheme – and in reducing emissions on a global scale.

- The Stern Review, quoting an International Energy Agency (IEA) study, concluded that energy efficiency has the potential to be the 'single biggest source of emissions savings in the energy sector'[19] and summarises energy efficiency as a way to cut greenhouse gas emissions that 'can save both money and emissions'[20].
- This view is supported by the abatement cost curve for Australia released by McKinsey and Company earlier this year[21] which estimated emission savings of 60 $MtCO_2$-e[22] could be realised in the building sector by 2030, at an average negative cost (that is, a benefit) of $130 per tonne CO_2-e. Much of this saving is achievable with current technologies, such as improving efficiency in air-conditioning, lighting, and standby power.

However, the extent of energy efficiency's contribution to national emissions reductions should be left to the carbon market to determine. Measures which seek to 'accelerate' the take up of energy efficiency, through various means, are inconsistent with a commitment to least cost abatement.

Since the 1970s, there has been a trend to higher energy efficiency and lower carbon intensity, suggesting that householders will change their use of energy, if it is 'sufficiently cost effective for them to do so'[23], or as a result of government policies, such as mandatory insulation in new buildings.

19 Stern, 2007, p xiii

20 ibid, p xii

21 McKinsey and Company, 2008

22 Mega tonne of carbon dioxide equivalent

23 Productivity Commission, 2005, p 103

To demonstrate the former, the Productivity Commission cites households' responses to the oil shock of the late 1970s which resulted in a widespread shift over time from oil heating to electric and gas heating[24]. Putting a price on carbon may have a similar effect.

However, households and businesses do not necessarily take up seemingly cost effective opportunities to improve their energy efficiency. It is well established that there are other factors which may act as barriers to the take up of energy efficiency opportunities that would otherwise be cost effective. In its review of the issue in 2005, the Productivity Commission found that these barriers could be grouped into three categories:

- **market failure** such as information failure (asymmetric information or information that has public good characteristics) and split incentives (for example, where the interests of landlords diverge from the incentives facing tenants);
- **cultural or behavioural barriers** which give energy efficiency low prominence in decision making; and
- **other barriers**, including capital constraints and individual perceptions of risk and uncertainty (for example, expectations of technological change).

Of these, the Review considers that market failure is the most compelling case for Government action. Cultural or behavioural barriers may also provide a case for intervention but in a business context there is a line between overcoming such barriers and the Government trying to tell businesses how to conduct their operations. Similarly, attempts to force consumers to behave in certain ways risks violating the principle of consumer sovereignty.

The Review considers that there is also likely to be a role for the Government in the short to medium term to assist households and businesses in making investments to improve their energy efficiency. However, such assistance should be broad based and technology neutral and would replace existing (technology-specific) rebate programs. The tax system may provide an avenue for providing such assistance (issues around the tax system more generally are discussed in Chapter 8).

The Government currently has programs which span all of these categories, with varying degrees of success. As part of its recommended future program suite, the Review proposes that these existing programs be consolidated into a new National Energy Efficiency Program.

Addressing significant market failures, or other rationales for government intervention, has the potential to help the ETS work more efficiently thus ensuring that the overall cost of reducing Australia's emissions is lower than it would be otherwise. However, this is not guaranteed – energy efficiency programs are not costless.

- As with any Government intervention the potential benefits need to be weighed against a rigorous assessment of the potential costs and action should only be taken where there are likely to be net-benefits for the economy as a whole.

5.2. National Energy Efficiency Program

There are 12 programs in the Review's energy efficiency category. Government commitments have been made in relation to six of them. Existing programs seek to encourage the uptake of cost effective, proven energy efficiency opportunities for business and households.

24 ibid, p 100

- They do this through measures to inform, limit or encourage consumption choices through a range of mechanisms including: financial assistance; general information and community engagement; minimum standard setting; disclosure at point of sale; and mandating the collection and consideration of energy efficiency opportunities by large energy users.

Some programs in the industry development category are also relevant – such as the Solar Homes and Communities Plan – to the extent that they subsidise the take up of technologies that reduce or change energy consumption by businesses or households.

As discussed in Chapter 2, the Review proposes that the Government establish a National Energy Efficiency Program (NEEP) into which existing programs would be consolidated and, where necessary, refocussed. It would have at least four sub-programs:

- national leadership, to provide an opportunity for the Commonwealth to demonstrate leadership on a nationally consistent approach to energy standards, and to reduce the carbon footprint of its own operations;
- energy efficiency standards, to overcome transaction costs or information asymmetries that act as a barrier to the take up of energy efficiency opportunities in relation to appliances, electric motors, buildings and transport;
- assistance for households, in particular low incomes households, to improve their capacity to overcome information and capital barriers to taking up energy efficiency opportunities;
- information for policy design – this would have two elements:
  - provide evidence to underpin energy efficiency policy development; and
  - demonstration projects for individuals, businesses and communities to understand how to improve their energy efficiency (especially in the agriculture and transport sectors).

This chapter discusses the rationale for each of these components of the NEEP. Note that separate discussion and recommendations in relation to:

- the Government's carbon footprint (part of the national leadership component of the NEEP) are made in Chapter 3; and
- addressing split incentives in buildings (one of the market failures related to energy efficiency) are made in Chapter 8.

5.3. Information failure

As was discussed in Chapter 4, there are a variety of ways in which the Government can and should respond to information failure. Importantly, not all instances of information failure will require Government intervention. The Climate Institute recently noted, 'whole professions exist whose sole raison d'être is to search out, package and interpret information for consumers and producers'.[25]

Where there may be a role for the Government is where information failures related to energy efficiency are of such significance that they lead to sub-optimal decision making by producers and consumers. How Government intervenes is expected to vary over time, as consumers become more experienced

25 The Climate Institute, 2008, pg 34.

in managing the impact of higher energy prices under an ETS. Further, in the future, technological solutions to energy efficiency, including information and remote demand management, are likely to become more common.

- The rollout of smart meters across Australia would allow consumers to monitor and manage their own energy consumption in real time. For this to change behaviour, however, households will need access to the information through in-home displays, coupled with the deregulation of retail energy prices.
- Importantly, technological solutions could include future private sector innovation in products and improved services, and Government intervention must take care not to crowd out or stifle this activity.

5.3.1. Regulatory approaches

Regulation has historically been the primary tool across jurisdictions to improve energy efficiency in businesses and the home. Regulating minimum standards has a low fiscal cost although the economic cost can be high, depending on the design and extent of the regulation.

A limitation of regulating minimum performance levels is that while it affects the availability of products and technologies, it is less effective in tackling how appliances, vehicles and equipment are used. Significant savings can also be achieved by changing established practices – for example, by running household or office heating a degree cooler in winter.

The main regulatory energy efficiency program is Action on Energy Efficiency (AEE) under the National Framework on Energy Efficiency (NFEE). The NFEE has been in place since 2004, and has made limited progress on implementing its agreed 2005-07 implementation program.

- Product coverage and the stringency of standards have increased progressively, as has public awareness of MEPS and labelling in the areas of equipment, appliances and buildings.
- Recent Government decisions have extended the activities covered by AEE to include specific initiatives to prohibit incandescent light globes and electric hot water systems. There is also a trend to widen the focus of regulation from energy efficiency to greenhouse efficiency, through the proposed national legislation on Greenhouse and Energy Minimum Standards (GEMS).

Regulation, in particular a combination of minimum standards and labelling, has arguably supported technology development. DEWHA has collected evidence that the combination of minimum standards and disclosure has reduced the energy intensity of appliances resulting in a 67 per cent reduction in energy consumption for new family sized, frost free, refrigerator-freezers between 1986 and 2005[26]. However, it is difficult to be conclusive about the impact of domestic minimum standards againt international product developments.

Further, these savings have been counteracted by a trend to more and larger appliances in the home, resulting in an overall increase in energy consumption (see Table 5.1). This further demonstrates that energy efficiency is not just about the state of the technology available to consumers, but how they use that technology is also important.

26 DEWHA, unpublished data

- Short of adopting an extreme command and control approach, there is little way of effectively controlling how consumers use products such as household appliances. Providing them with information and tools to manage their energy consumption would be a better approach.

Table 5.1 below details energy consumption by functional use within the residential sector. In this sector, heating and cooling account for 40.6 per cent of energy use, but only 19.6 per cent of residential emissions, as heating is provided by less emission intensive sources, principally gas.

Table 5.1: Trends in energy consumption and greenhouse gas emissions by residential use

	Energy consumption				Greenhouse gas emissions			
	1990		2008		1990		2008	
	PJ	%	PJ	%	Mt	%	Mt	%
Space heating	126.2	42.3	150.6	37.5	7.5	15.2	10.0	14.3
Water heating	85.7	28.7	92.4	23.0	16.8	34.2	15.5	22.2
Appliances	54.2	18.1	99.4	24.8	16.7	33.9	29.3	41.9
Lighting	14.8	5.0	27.0	6.7	4.5	9.2	8.0	11.4
Cooking	14.8	5.0	19.8	4.9	2.8	5.7	3.4	4.9
Space cooling	3.0	1.0	12.5	3.1	0.9	1.8	3.7	5.3
Total	**298.7**	**100.0**	**401.7**	**100.0**	**49.2**	**100.0**	**69.9**	**100.0**

Source: DEWHA, unpublished data

- With rising expectations of comfort, space cooling is one of the fastest growing sources of residential energy consumption and greenhouse gas emissions. Energy use for cooling has grown steeply to be more than five times the level of 1990.
- Overall energy use in the residential sector has increased by more than a third from 1990 levels with the largest increases in general appliances (an increase of more than 80 per cent to nearly 100PJ) and space heating (an increase of nearly 20 per cent to just over 150 PJ).
- Overall emissions in the residential sector have grown by more than 40 per cent since 1990, with the largest contributor being general appliances.

As such, there appears to be the potential for cost effective savings in energy efficiency, with concomitant reductions in emissions. For households, the areas with the greatest potential are general appliances and water heating, although lighting has also been area of significant growth in both energy and emissions.

5.4. Nationally consistent regulation

The availability and demand for products such as household appliances and motor vehicles are unlikely to differ markedly across State boundaries. Further, having to comply with multiple regimes around the energy performance of these products will impose costs on businesses that operate nationally. On this basis, the Review considers that it would be appropriate for the Commonwealth to take a leading role (consistent with principle 4) in promoting greater national uniformity in the regulation of energy efficiency standards.

The current national approach in energy efficiency standards operates under the Ministerial Council on Energy and the NFEE. This approach could be strengthened through the proposed NEEP, by increasing the Commonwealth's national coordinating and leadership role in energy efficiency, taking account of ETS design and the current COAG process.

Any attempt to widen NFEE to include the more holistic concept of greenhouse performance raises governance issues and runs the risk of increasing red tape. This development should only be considered on the basis of a rigorous cost benefit analysis.

The current move to address energy efficiency through COAG may be more appropriate, especially as it has the potential to encompass a broader agenda, including non-energy buildings measures, such as double glazing and insulation. The COAG process provides an opportunity to develop a common, national strategy with an agreed implementation framework covering all energy efficiency initiatives. At the Commonwealth level, this framework could be codified within the proposed GEMS legislation.

The Review's proposed National Climate Change Compact (see Chapter 3) could also refer to the willingness of jurisdictions to develop a national approach to energy efficiency.

Recommendation 5.1

The Commonwealth Government must take a leadership role through COAG to develop and implement a national approach to energy efficiency. This would include cooperation and agreement to:

- *coordinate Commonwealth, State and Territory payments to low income households;*
- *improve the energy efficiency of existing and new public housing and community buildings; and*
- *energy market reforms as outlined in Recommendation 7.1.*

5.5. Cultural and behavioural barriers

Cultural or behavioural barriers to the take up of energy efficiency opportunities may exist where, for a variety of reasons, energy use is not a priority within a business or an individual's spending decisions. There may be a legitimate role for the Government in addressing these barriers. However, it is a complex area and care needs to be taken that any action does not unnecessarily increase the regulatory burden.

5.5.1. Barriers within large businesses

The Government's EEO program is aimed at both overcoming information failures and on breaking down the internal barriers to improving energy efficiency within large firms.

The program targets the 215 largest business energy users, requiring (by legislation) that they assess the energy efficiency of their operations and identify all options for cost-effective improvements, and that these assessments be considered by their boards.

- Trials of the EEO assessment framework have shown that the process has yielded some significant savings for business. Its primary success appears to be in elevating the issue of energy efficiency to the board level where it can be integrated into wider business planning.

As noted elsewhere in the report, the introduction of a carbon price represents a step-change in the way the Australian economy operates. It will take businesses – even those that are high users of energy – some time to adjust to a new kind of 'business as usual'. Further, many of the firms currently covered by EEO will not be required to engage directly with the ETS in terms of having to acquit permits – their primary interaction with the scheme will be indirectly through higher energy prices.

EEO has the potential to assist large energy users in changing their energy consumption decisions. The Review would therefore see a role for EEO as a transitional program that should be continued until at least the end of its current five year cycle, with a review of its future in 2011–12.

- However, the Review would strongly support continued efforts to streamline reporting requirements under NGERS and EEO over this period to continue to reduce the compliance burden on businesses.
- To the extent that there are firms currently captured by EEO that would be liable entities under the ETS, the Government should consider excluding them from the program, on the basis that they will have a permit liability to manage directly.

An important feature of EEO is that it does not mandate spending on the basis of its mandatory assessment of the energy efficiency opportunities. This is in contrast to several state-based industrial energy efficiency schemes.

- The Victorian Environment and Resource Efficiency Plans commenced on 1 January 2008, mandating implementation of energy efficiency measures by large energy using companies.
- The New South Wales (NSW) Energy Savings Action Plans also mandates the implementation of opportunities identified in the energy efficiency action plans of the top 200 energy users.
- In 2007, the Western Australian Government announced plans to work with industry to develop a mandatory energy efficiency scheme applicable to large and medium sized power consumers.

Mandating investment restricts the investment choices made by businesses, is likely to encourage mere compliance behaviour rather than real corporate cultural change and add regulatory and compliance burden to a broader range of businesses. In the context of an ETS, such schemes have real potential to displace lower cost abatement opportunities elsewhere in the economy – thereby adding to the overall cost of abatement.

- The state-based schemes listed above are all examples of schemes which the States and Territories would agree to discontinue as part of the Review's proposed National Climate Change Compact (see Chapter 3).

5.5.2. Barriers within Small to Medium Sized Enterprises (SMEs)

Programs such as Greenhouse Challenge Plus and other voluntary business programs have targeted small business in the past in assisting them to better understand their energy use and emissions.

Like some large business, SMEs will interact with the ETS primarily through higher energy prices and will need to get used to factoring these costs into their decision making. There may also be a need for something similar to Greenhouse Challenge Plus, and potentially incorporating some elements of EEO, for SMEs beyond the introduction of the ETS.

- However, as with EEO this would only be expected to be a transitional measure and should not mandate any form of investment by SMEs. Further, given the number of businesses involved it would be preferable for participation in the program to be encouraged, but ultimately voluntary.

The Small Business and Household Action Initiative is collecting emissions information specific to SMEs through energy audits of 500 businesses and this will also be useful information in seeking to better target information and assistance for SMEs.

5.5.3. Barriers within households

Households can face barriers to the take up of energy efficiency opportunities including high transaction costs and information asymmetries when making choices about where they will spend their money. In addition, other features will have an equal or greater influence on their decision making than energy efficiency considerations.

All of these barriers effectively relate to the set of energy consumption choices available to households and their ability to differentiate between them. In the future the introduction of smart meters and cost reflective pricing of energy should assist households by expanding their understanding of their energy consumption choices.

In this context, the Solar Cities program is likely to provide useful data on feasible ways to engage communities, including both small businesses and household, on approaches to integrating solar technologies with energy efficiency and pricing innovations.

- The program trials the integration of distributed solar technologies with energy efficiency, load management, roll out of smart meters and cost reflective pricing of electricity in seven urban sites around Australia.

Recommendation 5.2

The Government should:

- *continue to require business to comply with the requirements of the Energy Efficiency Opportunities program; and*
- *develop a voluntary energy efficiency program targeted at small and medium size businesses that combines relevant elements of Energy Efficiency Opportunities and Greenhouse Challenge Plus to assist these businesses to improve their energy efficiency.*

5.6. Capital constraints

Taking up energy efficiency opportunities – in both households and businesses – often involves an investment with large upfront capital costs but potentially lower running costs over the future (for example, a decision to install a photovoltaic (pv) panel). Access to capital, and its alternative uses to a household or business, is therefore an important factor in decision making around energy efficiency. Capital constraints are not necessarily a compelling rationale for broad based energy efficiency measures but they may be relevant in the short to medium term as the economy goes through a step change in its use of energy.

- While the Review considers that there will be a role for the Government in facilitating this change for households and businesses generally, the case of assistance will be strongest in relation to low income households who will face greater obstacles to change.

The ETS is not intended to have adverse distributional impacts. The Government has committed that any revenue generated through the auctioning of permits will be 'recycled' and returned to households and businesses to adjust to the scheme and invest in clean energy options. This would include assistance through the tax and payment system to meet 'overall increases in the cost of living flowing from the scheme' and 'additional support' for energy efficiency measures[27].

This additional support could, and in the Review's opinion should, encompass assistance targeted at improving the take up of energy efficiency opportunities by households and businesses – for example, through some form of tax rebate.

- Any such assistance would need to be carefully structured to be as technology neutral as possible (and preferably also time neutral) and align as closely as possible with overcoming market failures such as information failure and split incentives. The potential use of the tax system to deliver this assistance is discussed in Chapter 8.
- Assistance for low income households will need to be more targeted, but there are a range of means by which assistance could be delivered to maximise its impact.

Importantly, the Review's proposed assistance measures should be seen as an alternative to existing programs that provide financial assistance (to households in particular).

- Within the Review's new program structure, broad-based assistance for households generally and targeted assistance for low income households would be delivered through the NEEP. Assistance for business would be delivered through the Climate Change Action Fund (see Chapter 8).

5.6.1. Existing financial assistance

Rebates to households in several existing programs attempt to drive the adoption of solar technologies and, more recently, energy efficiency. They have had mixed success.

- Approximately 16,000 PV systems have been installed over the past eight years under the Solar Homes and Communities Plan (SHCP, previously called the PV Rebate Program or PVRP) and RRPGP.
- Recent Government decisions have added rebates for solar and heat pump hot water systems and insulation for private rental properties, as well as low interest loans (Green Loans).

The small number of recipients of rebates, even in well funded programs, limits the abatement from these programs. Further, there is significant overlap between programs, both within the Commonwealth, and with the States and Territories.

- Some recipients can receive cumulative assistance from up to three programs for one action – a NSW household can receive support from two Commonwealth programs and one State government program towards the purchase of an approved solar or heat pump water heater (see Box 3.1).

27 Commonwealth of Australia, Green Paper – Summary Report, p 25

- The abatement achieved by these rebate programs is expensive. For example, the average cost per tonne of abatement through SHCP and RRPGP is very high (in the order of more than $300 per tonne – see Figure 3.1) compared to a possible ETS market carbon price closer to $20-–30 per tonne of carbon.

It is doubtful that low income households will benefit from any of the new rebate or assistance programs (SHCP, Solar Hot Water Rebates and Green Loans), which require people to opt-in and provide upfront capital or borrowing credentials.

- Such programs provide assistance to only a small proportion of the population, of the order of a few hundred thousand households, who are more likely to be in middle income brackets. The relatively generous means tests applying to the new programs, $100,000 for SHCP and Solar Hot Water Rebates and $250,000 for Green Loans, are unlikely to target this assistance towards low income households.

Common characteristics of existing schemes to assist low income households around Australia (such as those outlined in Box 5.2 below) include the provisions of customised information to low income households, frequently by non-government organisations in partnership with energy retailers and government, and practical assistance to improve energy efficiency, if necessary.

Rebates are an expensive form of incentive that diverts resources from other, more cost effective, activities; facilitates prescriptive solutions and assists only a limited pool of households and businesses. Information-based approaches to energy efficiency that allow households and businesses to choose which activities or new technologies make sense for their particular needs should be preferred.

- It is important to note that the most effective energy efficiency solutions will differ between households and business, across and even within different States and Territories. For example, tools to better manage peak load demand for power, such as smart meters and cost reflective pricing, will be more important in places where there is greater variability in temperature (for example, in South Australia rather than Tasmania).
- This reinforces why broad based assistance – potentially delivered through the tax system would be preferred to the current approach.

5.6.2. Low income households

There are around 1 million low income households in Australia. In general, the people with the highest proportion of income spent on energy are those with lower income levels, living in outer metropolitan and rural areas and with limited access to capital[28].

- In Victoria in 2001, 30 per cent of the top 10 per cent of electricity and gas consumers were concession card holders[29].

Low income households have a greater reliance on less efficient, second-hand appliances and vehicles, and cheaper, less energy efficient housing. Twenty-four per cent of low income households rent privately and a further 11 per cent rent public housing[30].

28 Brotherhood of St Laurence, 2007

29 ACOSS et al 2008, p 7

30 ibid, p 24

The split incentives applying to low cost rental housing provide little reason for landlords to improve the thermal efficiency of the building and results in added heating and cooling costs for the tenant. There will also be limited opportunities for such tenants to resolve these split incentives through 'green leases' as there may be in the commercial sector (see Chapter 8).

It may be worthwhile to strengthen this approach to assisting low income households through the NEEP by providing assistance through non government organisations that already work with such households and can also provide assistance in related areas, such as budgeting and life skills.

An option may be to run a tender process seeking proposals from energy retailers and non government organisations that outline their ideas for improving energy efficiency for low income households and an indication of the area over which they would have the capacity to implement those ideas, if given government support.

Box 5.2: Programs around Australia which assist low income households with energy affordability

- **Phoenix Fridge Project – Moreland Energy Foundation and St Vincent de Paul in Victoria:** a 2003–04 pilot project of energy efficiency improvements in second-hand refrigerators donated to low income households. Gains of 25–50 per cent were achieved at relatively low cost, delivering potential electricity savings of $50–75 per year. As well, unrepairable refrigerators were removed from use.
- **Energy Matters – AGL and Mission Australia in South Australia:** a three year pilot launched in December 2007, providing financial counselling, energy auditing and budgeting services to people facing difficulties in paying their energy bills. The program includes access to no interest loans to purchase efficient appliances.
- **Residential Energy Efficiency Scheme in South Australia:** a new energy efficiency target scheme, from 1 January 2009. The program will require energy retailers, working in partnership with other service providers, to provide energy audits (including to low income households) and implement energy efficiency improvements.
- **Kildonan UnitingCare in Victoria:** works in partnership with various energy companies to assist consumers better understand their energy usage and align usage with affordability. This is mainly done through Energy Efficiency Audits in the home. They have found that households can make significant savings on gas, electricity and water through practical, low or no cost changes.

5.6.3. Energy audits

Energy audits are a practical way to educate households on energy efficiency. They can be customised to the particular circumstances of individual households or businesses, who can then decide how they act on the information.

- A number of jurisdictions provide subsidised energy audits. At the Commonwealth level, the new Green Loans program is expected to fund 360,000 audits. Around 200,000 of these audits are expected to result in households taking up the low interest loans.
- Some energy retailers and non government organisations are already providing these and similar services to their customers, and government programs should take care to avoid crowding out this activity.

Engaging low income households successfully requires sensitivity and a partnership approach, in addition to technical auditing expertise. The information from the audit should be practical, customised and delivered one on one. An audit is likely to be useful to both tenants and homeowners.

Audits can also be combined with more interventionist assistance to tackle particular impediments, such as lack of access to capital. This would require a fund for grants and low interest loans, which could consist of funding reallocated from current programs. Simple solutions should be tried in the first instance, including behavioural changes, house repairs and more efficient appliances.

Each household is different and the solutions to energy efficiency in each case are also likely to be different. For some households, for example, high quality curtains may be a better solution than insulation.

- Anecdotal evidence from use through the Solar Cities program is that tailored solutions are likely to achieve better results than blanket, deterministic programs.
- An energy audit of some description would underpin a tailor made solution for a household that is more likely to yield sustainable results over time.

The Review proposes to include a component in the NEEP that would aim to increase understanding of energy efficiency in low income households and assist them where necessary to implement energy efficiency improvements.

5.6.4. Skills constraints

In a full employment economy, energy efficiency measures may add to existing skills and capacity constraints and put upward pressure on prices for energy services, including energy audits. The skills capacity in energy services is already being tested by programs such as EEO and NGERS, and the subsidised energy audits provided by Green Loans and State programs.

- These programs, and a general increase in community and business interest in improving energy efficiency, will serve to grow the energy services sector in the longer term.

However, this is an area where the Government has a role in building capacity through training and service accreditation in partnership with industry. The Review proposes that this partly be addressed through the 'Green Skills Initiative' which forms part of its ideas for the Climate Change Action Fund.

Recommendation 5.3

To improve the ability of energy users to better manage their energy consumption following the introduction of the ETS, the Government should consider measures that include:

- *broad-based assistance to facilitate investments by households, in particular low income households, and businesses in energy efficiency improvements;*
- *provision of information and tools to assist households and businesses in identifying energy efficiency opportunities which may include support for widespread energy audits and customised consultations in-situ; and*
- *incorporating and expanding the consideration of energy efficiency into the training and development of professionals in engineering and industrial design as well as ensuring that there is sufficient investment in the training of auditors and professional standards (in partnership with industry associations).*

However, it is important that any such measures would need to be subject to a rigorous cost-benefit analysis of the merits of different approaches and would be instead of, rather than in addition to, existing programs.

5.7. Energy efficiency targets and schemes

National or sectoral energy efficiency targets or schemes are often cited as a means of achieving greater energy efficiency across the economy. However, such targets or schemes are unlikely to be complementary to the ETS as – in a more targeted way than the expanded national RET – they require a certain part of the abatement task set by the ETS to be achieved through energy efficiency. This limits the ability of those subject to the ETS to choose where it is most cost effective for abatement to occur.

- Energy efficiency targets could potentially be contemplated as a means of achieving abatement in a sector, or part of a sector, not covered by the ETS. However, this would just be one of a range of options to be considered.

Such targets or schemes will be superseded by the ETS. They risk interfering with the price signal arising from the carbon market and will bias the choice of abatement measures towards energy efficiency and away from other abatement options such as renewable energy. Additional measures that address energy efficiency can only lower the cost of abatement by addressing market failures relating to energy efficiency, such as information failures (as discussed below).

Some states have begun implementing energy efficienct targets and credit trading schemes, and there is a risk that these schemes will complicate and undermine the introduction of the ETS.

- The proposed South Australian scheme (to commence on 1 January 2009) aims to increase energy efficiency in South Australian dwellings by ten per cent between 2004 and 2014. All licensed retailers of electricity and gas to more than a certain number of residential customers are obliged to meet an energy efficiency target (greenhouse gas reduction) and an energy services target (audits in low income households).

- The NSW Government has established a 'White Certificate' scheme. White certificates are tradeable energy efficiency certificates providing a guarantee that a certain amount of energy saving has been achieved. Under the NSW scheme, which is part of the Greenhouse Gas Abatement Scheme, eligible energy efficiency projects may receive tradeable NSW Greenhouse Abatement Certificates.

Maintaining these schemes also impose significant compliance costs on industry, in addition to those impose through the ETS.

As part of its proposed National Climate Change Compact, the Review proposes that the Commonwealth, State and Territory governments agree to abolish any existing energy efficiency targets or schemes and to agree that primary responsibility for mitigation policy should rest with the Commonwealth (see Chapter 3).

5.8. Conclusion

Following the introduction of the ETS, energy efficiency measures need to be about making the scheme work more effectively rather than duplicating the scheme's role in driving abatement.

There will be a role for the Government in addressing information failures associated with energy efficiency. However, the most appropriate response will increasingly be one of information provision and disclosure rather than increasingly stringent minimum performance standards.

Business and households will also need to understand what they can do to adjust to higher energy prices flowing from the ETS. Programs such as EEO and measures like energy audits may be useful transitional measures in this regard. However, decisions around what changes to make should be left to individual businesses and households rather than being determined by Government decree. Nonetheless, the Government will have a role in supporting these decisions through the provision of broad-based financial assistance (potentially delivered through the tax system).

Those in greatest need of assistance in improving their energy efficiency will be low income households but in addressing this need the Government should seek to leverage the work already being done by a range of non-government organisations.

06

CHAPTER SIX:
SUPPORT FOR LOW EMISSIONS TECHNOLOGY

Summary

This chapter considers whether there is a need for targeted Government support for the research, development and demonstration of low emissions technologies following the introduction of the ETS. A further consideration is whether a case for support in addition to the Government's generic support for innovation can be made.

Based on its assessment of existing programs and broader analysis of technology development, the Review considers that a case could be made for providing some time-limited, additional support for the development, demonstration and commercialisation of low emissions technologies by consolidating existing programs into a new investment vehicle – the 'Carbon Technology Trust'.

The Review also considers that Australia has a strategic national interest in the development of CCS technologies and there is a need to accelerate the development of these technologies to the point where they can be demonstrated on a large scale. The Carbon Technology Trust may be able to a useful role in the development of CCS technologies and projects.

6.1. Introduction

Targets for reducing greenhouse gas emissions, such as a 60 per cent reduction by 2050, are unlikely to be achievable without the development and deployment of new technologies, particularly in the energy sector. Fossil fuels (coal, oil and natural gas) provide nearly 95 per cent of Australia's primary energy supply[31] and produce nearly 70 per cent of Australia's emissions[32]. The IEA advises that large emission reductions will require a technological transformation of the energy sector on an unprecedented scale[33].

Governments in Australia and overseas are providing substantial support for low emissions technologies across the 'innovation chain' (described in Box 6.1 below). The rationale behind public investment in innovation (of any kind of technology) is the existence of spillover effects that act as a barrier to investment – that is, the inability of one individual or company to capture sufficient benefits from their investment in innovation (such as research) to justify a socially optimal level of investment.

Spillovers are thought to be most prevalent in relation to 'basic' or 'early stage' research. The Government provides considerable generic support for this kind of activity. In Australia, this early stage research is undertaken by universities and research organisations, such as the CSIRO. In this respect, technologies that reduce emissions of greenhouse gases are no different from any other technologies.

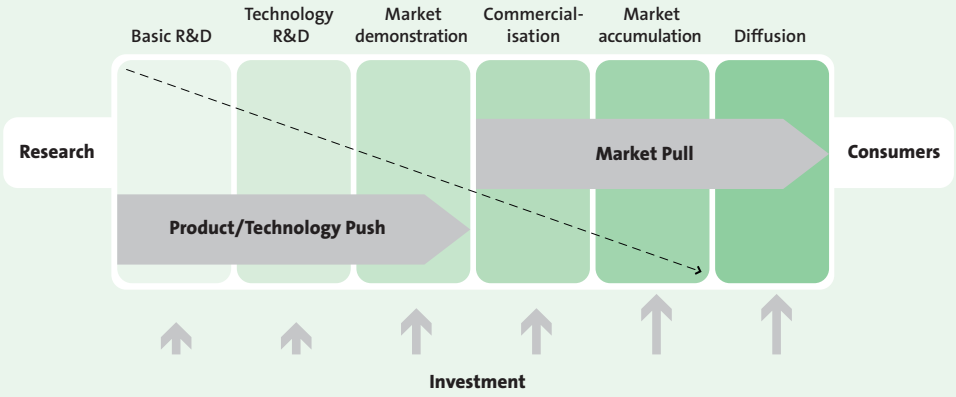
In contrast, spillovers at the market diffusion or deployment stage are thought to be minimal, or at least not a significant barrier to investment. At this point, the Government's role is to ensure that market frameworks, such as regulatory settings and property rights, are appropriate. In this context, the ETS will increase the potential returns on investments in new technologies with lower emissions profiles by increasing the cost of established, higher emission technologies. The role for the Government in relation to the deployment of new low emissions technologies is discussed in Chapter 7.

31 ABARE, 2007, p 2

32 DCC, 2008, p 1

33 IEA, 2007

Box 6.1: The innovation chain



Source: Grubb 2004, p. 20.

The above diagram illustrates the stages through which innovation proceeds. The Productivity Commission emphasises that this is not a linear process, but a system with dynamic feedback loops.

- **Early stage research and development:** The accumulation of new fundamental knowledge with no specific application. This research is usually undertaken with public funding in public institutions, such as universities and the CSIRO.
- **Technology research, development and demonstration (RD&D):** The synthesising of new knowledge into an idea and subsequent development to an end use concept or product with commercial potential. The applied research phase may involve a combination of public institutions and private funding.
- **Market demonstration**: Shows that the concept or product is viable in real world applications with market potential.
- **Commercialisation:** Established or newly created firms adopt the concept or product marking the transition from public to private institutional funding.
- **Market accumulation:** This stage marks the expansion in the use of the technology, possibly through niche or protected markets.
- **Diffusion:** The concept or product becomes widely available and adopted in the broader market.

Sources: Grubb, 2004, p 18 and Productivity Commission, 2008, p 22.

Where the role for government intervention is less clear is in relation to the development, market demonstration and commercialisation of new technologies, which form the middle stages of the innovation chain. It is not clear that the 'market pull' provided by emissions trading will be sufficient, by itself, to bring through the range of technologies required to meet future emissions targets, particularly in the energy sector.

- That is, even with a price on carbon, there are market failures that could provide a case for government intervention, at least prior to the ETS providing a strong carbon price which, depending on the trajectory and short-term caps chosen, could take some time.

The Government provides support for research and development (R&D) activities primarily through the R&D Tax Concession which allows businesses a tax deduction of 125 per cent of their eligible R&D expenditure (primarily labour costs) and a 175 per cent deduction on any eligible R&D expenditure over and above a rolling three year average. The role of venture capital in commercialisation also receives support through the tax system.

Whether the spillovers from the development and demonstration of low emissions technologies are so much greater than in relation to other activities is difficult to prove – spillovers are by their nature intangible and not easily subject to measurement. Any judgement for or against is essentially something to be taken on-balance.

Certainly to date low emissions technology development and demonstration has been the recipient of considerable support. The Review has found it difficult to conclude that existing programs in this area have produced benefits that justify the costs involved. They also do not generally appear to represent best practice policy design.

- There are multiple programs each supporting a particular type or group of technologies. While a mix of technologies will be required, existing programs have not been explicitly designed or funded with a view to building a portfolio of technologies that make sense for Australia. That is, there does not seem to be any explicit link between expected spillover effects and the quantum of funding committed to either the area generally or specific technologies.
- Recent programs have generally offered one-off grants to specific projects, an approach that does not seem to fit well with the model used for financing and delivering large projects in the commercial sector, where a series of decision points are involved, and where the scope and scale of the project may need to change.

The Review considers that the existing suite of programs do not provide the best response to the underlying problem of bringing new low emissions technologies to market. On this basis, the Review has considered how existing programs could be re-engineered to ensure that in the future the Government's support for development of low emissions technologies meet both principles 1 and 5.

Establishing a new entity, analogous to the technology role of the United Kingdom's (UK) Carbon Trust, is one model that would appear to address some of the issues associated with existing programs. The working title given to this new body is the 'Carbon Technology Trust' (the Trust). While more detailed scoping work would be required, this chapter includes an outline of the general features the Review envisages for the Trust.

- The Review envisages that, subject to timing, existing programs that support the development and deployment of low emissions technologies could be consolidated in the Trust and also that the Trust could be used as a vehicle for delivering any additional support the Government may wish to provide in this area.

6.2. Early stage research and development

As outlined in recent reports by the Productivity Commission[34], the rationale behind public investment in innovation is the existence of spillover effects – that is, the inability of one individual or company to capture sufficient benefits from their investment in innovation to justify a socially optimal level of investment:

> '[Spillovers] are benefits that cannot be captured by the innovator – ideas that can be used, mimicked or adapted cheaply by firms or others without payment to the originator. Spillovers may arise through the development of basic knowledge capabilities or diffusion of new ideas among firms and others[35].'

Spillovers are thought to be most important as a barrier to investment in the earlier stages of basic and applied technology research, where commercial interest is low and support is provided mainly from public sources. While not determinative, the Review notes that recent inquiries into emissions trading have all found that Government funding for early stage research is likely to complement emissions trading[36].

In Australia, this early stage research is undertaken by universities and research organisations, such as the CSIRO, and with funding from government agencies, primarily the ARC. The Review considered one of CSIRO's flagships, two ARC Centres of Excellence and two Cooperative Research Centres, as part of its assessment of existing programs in this area. Note that issues relating to Australia's investment in climate change science – also in the early stage research section of the innovation chain – are discussed in Chapter 9.

In all cases of support for early stage research considered by the Review, low emissions technology had to compete for funds against alternatives. The Review considers that this is appropriate – it has found no evidence that the spillovers from early stage research associated with climate change adaptation or low emissions technology is likely to systematically produce spillovers that are greater than those produced in other fields of research.

On this basis, all six research centre programs were found to be complementary to the ETS. The Review notes that the outcomes of the Review of the National Innovation System will provide the Government with more detailed advice on policy settings to support early stage research more broadly.

Recommendation 6.1

The Government should continue to provide support for early stage research and development into low emissions technologies as part of its general support for a well functioning national innovation system.

34 Productivity Commission, 2007, 2008

35 Productivity Commission 2007, p xviii

36 NETT, 2007, p. 212, TGET, 2007, p 126-7 and Garnaut, 2008, p 403

6.3. Technology development and demonstration

6.3.1. The rationale for Government support

The market demonstration stage is where the performance, viability and market potential of new technologies are demonstrated in real world applications to potential buyers and users. The commercialisation stage is characterised by the adoption of the technology by established firms or the establishment of new firms based on the technology[37].

Debate on whether emissions trading alone is sufficient to bring a range of low emissions technologies through this middle section of the innovation chain is characterised by two competing outlooks, which the Productivity Commission identifies as 'technology push' and 'demand pull'[38].

On the 'technology push' side, arguments in favour of support for technology development hinge on the ineffectiveness of emissions trading, even one with long-term targets, banking of permits and a secondary market which helps to establish forward prices, to drive investment in the technologies that are expected to be needed to meet future emissions caps.

Montgomery and Smith[39] go so far as to argue that any long term target that is high enough to pull through low emissions technologies of the kind and scale required to make substantial cuts in future emissions are too high to be credible. They contend that the kind of economic pain involved in such targets is of a degree that any government subject to a regular electoral cycle will find itself unable to stand by its commitment. On this basis, they argue that aggressive technology policy is a better policy response than imposing a cap on emissions.

A less extreme argument in the same vain is that even with a well-designed scheme, the inherent uncertainty around future government regulation (of the scheme and of new technologies), and prevailing economic conditions, leads to under investment.

There is some evidence that policies relying on market pull and public support for early stage research and development are insufficient to bridge the technology 'valley of death' – particularly in the energy sector, which is characterised by large investments in plants and facilities with long operational lives and low product differentiation[40].

- In the energy supply sector, demonstration projects may involve the construction of large facilities at a commercial or near commercial scale, which reflects the capital intensive nature of the sector. For some technologies, smaller demonstration projects may be appropriate where the technology is modular and commercial scale is achieved at a smaller size. This is the case with some renewable energy technologies. In other parts of the energy sector, however, demonstration projects are large with attendant financial risks for new technologies.

In its Draft Report, the Garnaut Climate Change Review[41] describes potential 'first mover' spillovers at the demonstration and commercialisation stages. These include knowledge spillovers, where innovation occurs visibly in the marketplace, and regulatory and social acceptance spillovers, where a

37 Grubb, 2004, p 18.

38 Productivity Commission, 2008, p 23

39 Montgomery and Smith, 2005

40 Grubb, 2004, p 23-4

41 Garnaut, 2008, p 414-6

pioneering firm bears the cost of resolving regulatory, legal and acceptance issues around the use of a new technology. First movers can also pioneer the training and development of appropriate technical skills and provide the focus for the development of a range of supporting firms and industries. The cumulative effect of these spillovers may provide a strong disincentive for first movers, particularly in the energy sector where innovation occurs in large, commercial plants.

The Productivity Commission also acknowledges that market demonstration and commercialisation are characterised by high costs and low returns[42]. However, programs at this stage of the innovation chain 'should seek to target innovative and high risk activities that can demonstrate additionality'[43]. On this basis, the Review finds that there is a case for government intervention to support the development and demonstration of new low emissions technologies for a limited, transitional period until the emissions trading scheme provides a strong signal of future emission prices.

- This finding rests on the assessment that there is significant potential for spillovers at the market demonstration and commercialisation stages of the innovation chain for some low emission technologies that may not, at least in the short to medium term, be overcome by the carbon price signal provided by an emissions trading scheme.

6.3.2. International context

Technology development, particularly the development of low emissions technologies, is a global activity. Australia's contribution is modest, reflecting the size of the Australian economy in comparison with the global economy. Fundamentally, Australia is an importer of technology and in this respect; low emissions are no different from other technologies. As such, most of the major steps in the development of new technologies needed by Australia are likely to be made overseas.

From a strategic viewpoint, Australia should seek to become a 'fast follower' and concentrate its efforts on importing and adapting new technologies pioneered overseas to suit Australian conditions. There may be reasons – due to Australia's environment or geology, for example – why a technology pioneered overseas cannot be immediately deployed in Australia. In such cases, the technology may need to be trialled locally and modified before being able to be deployed commercially.

This represents a challenge to policy making in this area which existing programs do not appear to have resolved.

6.3.3. Other sectors

Programs focussed on technology development have been largely grants programs and directed toward renewable energy technologies. While technological change in the energy sector will be critical, over time there will be a need for change in other sectors as well – notably transport and agriculture (broader issues in both sectors related to emissions trading are discussed in Chapter 8).

42 Productivity Commission, 2008, p 22

43 Ibid, p 29

6.3.3.1. Transport

The transport sector is one area where Australia will need to follow international developments. Although Australia has a significant manufacturing capability in motor vehicles, the technology is largely developed overseas, reflecting the international nature of the industry.

The Bureau of Infrastructure, Transport and Regional Economics[44] advises that there is significant scope to reduce emissions from transport through new technologies. Most of these technologies aim to improve fuel efficiency and thereby reduce emissions, although there is scope for technologies to manage transport networks, such as intelligent transport systems. Conventional technologies to improve fuel efficiency in motor vehicles include aerodynamic improvements, lightweight materials and advanced engines and controls. In addition, there are alternative motor vehicle technologies such as hybrid vehicles, fuel cell vehicles and electric vehicles.

6.3.3.2. Agriculture

The agricultural sector, in contrast, is one where Australia may be able to play a leading role. As the Draft Report from the Garnaut Review notes, almost a quarter of government expenditure on research can be attributed to plant and animal production[45]. Much of this support is delivered through the CSIRO and the RDCs, both of which facilitate industry co-investment.

From the perspective of emission reduction, there may be significant scope for new technologies in agriculture, including new fertilisers for crops and new food additives, vaccines and hormones to reduce methane production by livestock. Such technologies also hold the promise of other benefits. For example, reduction in methane emissions from livestock may increase the productivity of agricultural animals.

6.3.4. Existing programs

Existing programs supporting the development and demonstration of low emissions technologies appear unlikely to deliver a sufficient portfolio of technologies that will facilitate Australia's transition to a low-carbon economy.

This can potentially be attributed to the lack of flexibility in approach and scope inherent in most existing programs – a majority of which are grant programs and directed toward specific energy technologies. Grants are generally limited by a specified maximum proportion of project costs for specified eligible technologies and projects and involve one-off funding decisions in discrete funding rounds.

- This approach to funding does not seem to fit well with the model used for financing and delivering large projects the commercial sector, where a series of decision points are involved, and where the scope and scale of the project may need to change.
- An approach which favours the use of discrete 'buckets' of funding leaves the Government open to continued lobbying from those groups that do not benefit from any one funding bucket.
- Further, it can take considerable time for technology development and demonstration projects to achieve results and even the best process for allocating funding may end up supporting projects that ultimately fail (this is a concomitant part of the innovation process).

44 BTRE 2002, p. 73

45 Garnaut, 2008, p. 414

The difficulties experienced with existing technology programs are best demonstrated by the $410 million LETDF. Despite being announced in June 2004 and having completed its funding round between October 2006 and March 2007, as at 30 June 2008 full contracts for only three projects had been signed, although a total of six projects have been announced. It will take much longer for results from projects supported under LETDF to emerge.

The Government has announced four new programs to support the development and demonstration of new technologies with lower emissions profiles: the National Clean Coal Fund, the Renewable Energy Fund, the Energy Innovation Fund and Climate Ready (part of the Clean Business Australia initiative).

- These four programs have between them $1.225 billion in funding, more than $800 million of which is allocated in the forward estimates to 2011-12.
- These new programs continue the approach of having multiple funding pools that provide grants to support the development and demonstration of specific technologies. This is exacerbated by the fact that much of the funding under these programs has been committed to specific technologies and specific types of projects.

In contrast, REEF – a venture capital fund for renewable energy – appears to have had a degree of success which can be partly attributed to the fact that the delivery of support was effectively placed at arms length from the Government (further information about REEF is contained in Box 6.2). However, the Review notes that REEF, which was established in 1999, has had longer to produce results than other existing programs (such as LETDF).

The administration of existing programs also appears to be cumbersome and unnecessarily complex. At present, three departments have responsibility for programs on technology development: DEWHA, DIISR and DRET. This arrangement requires each department to build expertise in technology and engineering as well as commercial financing and venture capital. The approach taken by departments in meeting this need is to establish technical and expert committees and panels.

- It may be preferable to take this approach a step further and consolidate the various programs by establishing a commercial entity to provide government funding for development of low emissions technologies.

The approach taken with most of the technology grant programs examined by the Review is that the rights to any intellectual property developed as part of the project funded by the grant are retained by the grantee; the Commonwealth does not take an interest in the intellectual property. This approach recognises that government departments are poorly placed to manage ownership of intellectual property, and program objectives are best met by allowing companies and researchers to exploit any intellectual property produced by projects funded by government grants. However, this approach could also act as a barrier to the spillovers inherent in the project actually being realised.

Box 6.2: Renewable Energy Equity Fund

REEF was established to assist companies developing new renewable energy technologies and to develop venture capital fund managers with experience of investing in the renewable energy sector.

REEF was announced in November 1997 as part of the 'Safeguarding the Future' statement on climate change. A fund manager, CVC REEF Investment Managers Ltd, was selected in a competitive tender process and the fund was established in December 2000. The Government provided $17.7 million, which was matched by $8.9 million from private investors. This provided a total of $26.6 million for CVC REEF Ltd to make investments and pay management fees.

CVC REEF Ltd has invested in 13 small Australian companies developing or commercialising renewable energy technologies, including companies engaged in activities, such as the manufacture of photovoltaic cells. Companies in which CVC REEF Ltd has invested cover a wide range of renewable energy technologies including: wind, geothermal and biomass. The program is due to close on 26 October 2010, subject to an extension period of up to three years to allow for the orderly and prudent realisation of investments.

REEF appears to have been a successful program. Advice from DEWHA is that most of the investments by CVC REEF have been successful. CVC REEF has returned over $7 million to the Commonwealth from successful investments. CVC REEF Investment Managers Ltd won an investment award in 2004 from the Australian Private Equity and Venture Capital Association for CVC REEF's investment in Geodynamics Ltd.

In summary, what effective support for low emissions technology development and deployment seems to require is an approach which allows a portfolio of technologies to be built based on expert advice. Flexibility is required in order to align the expected level of spillovers – or benefits that cannot be captured by any individual investor – with the amount of public support provided.

Both bureaucrats and the Ministers they serve are not best placed to deliver on these needs. Ministers in particular will regularly be called upon by their constituents to make decisions in pursuit of other objectives which detract from Australia's interest in building a portfolio of technologies. The Review considers that greater use of independent decision making in how public support for low emissions technology development and demonstration is allocated would be appropriate.

6.4. The Carbon Technology Trust

Having established a case for supporting the development and demonstration of low emissions technologies, particularly in the energy sector, and concluded that existing programs are not best placed to meet this need; the Review has given some thought as to what alternatives the Government could consider in this area.

In attempting to develop potential alternatives to the current approach, the Review has sought to consider the international experience in this area. One model that appears to have merit is the UK Carbon Trust (see Box 6.3). Establishing a new entity analogous to the technology aspects of UK Carbon Trust is an approach that the Review considers would address many of the issues associated with existing programs. While more detailed scoping work would be required if the Government were interested in the idea, the general purpose and features of the Trust and some initial thinking about its structure are outlined below.

6.4.1. Purpose and functions

The Review envisages that the Trust would have an overarching mandate to facilitate Australia's transition to a low carbon economy by investing in the development and demonstration of a portfolio of low emissions technologies across the economy.

The Trust would be expected to invest in the development and demonstration of new technologies in the transport and agriculture sectors, not just the energy supply sector. It would also be expected to invest in energy efficiency technologies. In this way the Trust would provide a mechanism to balance the preference that support be technology neutral (that is, that public support not be used to 'pick winners') with the desirability of targeting technologies of strategic importance to Australia.

There is a variety of ways in which such a mandate could be more formally articulated. For example, the Trust could be given a broad mandate to invest in 'socially valuable low emissions technology development and demonstration across the economy', noting that each of these relevant terms would need to be defined.

- For example, 'socially valuable' could encapsulate both the existence of spillovers that are acting as a meaningful barrier to investment and the concept of investing in Australia's national interest. This kind of mandate would also help to ensure a better alignment between the amount and kind of public support provided and the underlying rationale of spillovers and additionality.

Alternatively, the Trust could identify potential investments on the basis of the criteria proposed by the Garnaut Climate Change Review[46]. These are: the emission reduction potential of the technology, whether the project qualifies as an 'early-mover' innovation and the likelihood of spillovers from the project.

- The Review considers, however, that the Carbon Technology Trust should be free to invest in projects in whatever manner it deems most appropriate, rather tying government support to fixed ratios of matched funding, as the Garnaut Climate Change Review proposes. This flexibility would help to overcome the limitations that characterise existing technology support programs.

The Trust would also be better able to manage the intellectual property developed from any project it funds. The diffusion of this intellectual property may assist in the commercial adoption and use of any technology developed with funding from the Trust. This diffusion, however, would need to be balanced against ensuring that the commercial value of the intellectual property to the Trust is preserved. The Review considers that a commercial entity, such as the Trust is proposed to be, would be better equipped with the expertise to balance these competing interests, than a government agency.

46 Garnaut, 2008, pp. 421-2

Box 6.3: The UK Carbon Trust

In attempting to develop alternatives to the current approach, the Review has sought to consider the international experience in this area. One model that appears to have merit is the UK Carbon Trust.

The UK Government established the Carbon Trust in 2001 to drive energy efficiency and the development of low emissions technology in the economy. The aim of the Carbon Trust is to accelerate the transition to a low carbon economy by helping organisations reduce their greenhouse gas emissions and by developing commercial low emissions technologies. (It is only the technology development function that the Review would see being applied in Australia.) The Carbon Trust was established as a not-for-dividend company limited by guarantee so that it could act independently of government and work with businesses on an equal footing.

The Carbon Trust's Board includes two executive directors, alongside representatives from each of the funding bodies and ten representatives from the private sector and other relevant stakeholders. The Trust is funded largely by government departments, of which the Department for Environment, Food and Rural Affairs is the main contributor.

A recent UK National Audit Office (NAO) report on the Carbon Trust states that the Carbon Trust had five subsidiary companies at 31 March 2007 to invest in low carbon technology companies, to advise on its investment portfolio, and to develop low carbon businesses. The Carbon Trust's funding has increased over time from £2.9 million in 2001-02 to £103 million in 2006-07.

The NAO found that the Carbon Trust's support of emerging low emission technologies appeared to have helped overcome many of the barriers that researchers typically face and the Trust has also leveraged private sector investment to develop the commercial potential of new technologies. The Carbon Trust's focus on the commercialisation of low emission technologies differentiates it from other sources of government funding, and has enabled it to secure £2 of private investment for every £1 it has committed through its Innovation Program, and £10 for every £1 committed to its venture capital investments.

In addition, the NAO reports that the Carbon Trust's 'Research and Technology Accelerators' appear to be particularly well designed to fill what could otherwise be a barrier in the development of commercially viable low emission technologies. The report notes that the Carbon Trust's coordination of businesses and researchers to collaborate on these accelerator projects appeared to be unique and that the Carbon Trust's focus on applied research and commercial development rather than on pure research and academic achievement meant it supported a different range of projects from other sources of grants.

Source: National Audit Office.

As discussed above, critical to Australia's use of technology to reduce its emissions in the long term will be its ability to apply new technology pioneered overseas. On this basis, the Trust would be able to consider where Australia really needs to be a technology leader and where it makes more sense for us to be a 'fast follower'. This would require the Trust to have sufficient scope to participate in international technology projects, with a view to the potential demonstration of the technology in Australia, in pursuit of the Trust's mandate.

- However, the overarching rationale of spillovers and additionality would also apply in respect of any international projects – that is, the Trust would need to guard against displacing participation by Australian firms.

The Trust would, in the first instance, be budget neutral as it would involve the consolidation of the Government's existing technology programs – the National Clean Coal Fund, the Renewable Energy Fund, the Energy Innovation Fund and the Climate Ready from the Clean Business Australia initiative (noting that these programs are all in the process of being implemented concurrent to the Review's deliberations). However, this would not preclude the Government from making further contributions as part of the annual budget process.

- To the extent that the Government is minded to provide further support for low emission technology development and deployment along side structural adjustment assistance for the electricity sector or businesses more broadly, then the Review considers that the Trust would seem to be more likely to achieve real outcomes for the economy than existing programs. Issues around support for 'clean coal' technologies are discussed in more detail in Chapter 7.

State and Territory governments could also be encouraged to redirect their existing technology programs to the Trust as a means of streamlining existing climate change measures. As noted in Chapter 3, the Trust could be referenced in a new National Climate Change Compact between the Commonwealth, States and Territories.

The Review considers that the Trust could have other benefits in terms of giving the Government somewhere to refer new requests for assistance which it will inevitably receive. It would also simplify the Government's public communications around support for low emissions technology – rather than listing a series of programs, the Government would be able to point to the Trust.

The Government is regularly lobbied by groups claiming that certain barriers exist to the demonstration of new technologies. A potentially useful role for the Trust would be as an alternative source of advice to Government on where such barriers exist – that is, where the Trust encounters regulatory hurdles or excessive red tape, this could be communicated to the Government for consideration.

The Review would envisage the Trust being a time limited initiative in the transition to emissions trading. Balancing this against the lead times involved in technology development (one of the issues identified in the Review's assessment of existing programs) a potential end date for the Trust would be 2020. To maintain some flexibility, the Trust could be reviewed in the lead up to the end date set to allow the Government to consider options for winding up the Trust (which might include its eventual privatisation).

6.4.2. Structure

The Review acknowledges that there is a preference within government not to establish new institutions or entities unless there is a compelling reason to do so. In this case, the Review considers that the benefits that could be gained from a model like the Trust justifies the creation of a new entity.

There are a range of governance models that could be applied in setting up the Trust – the most appropriate model would need to be determined as part of further scoping of the concept, should the Government be interested in exploring the idea further.

The Trust would need to be independent of government in respect of its decision making, and therefore would need to be accountable for its decisions and performance. This would indicate that, regardless of the exact legal status of the Trust, decision making powers around investments should be vested in an independent board with an appropriate level and mix of expertise in the fields of venture capital, finance, technology and public policy.

- Independent decision making will be important if the Trust is to successfully act as a buffer between the Government and those seeking public support for technology development and demonstration projects.

The Review recognises that there are a variety of ways in which this independent decision making could be achieved in practice. One option would be to establish the Trust as a new company, governed by the *Corporations Act 2001*. Alternatively the Trust could be established under legislation, in a similar way to Innovation Australia, some of the RDCs or the Future Fund.

Given the quantum of funds likely to be involved, it would seem reasonable for the Trust's board to be subject to directions from the Government from time to time (as is the case for the Future Fund). Further, in specifying the Trust's mandate, consideration would need to be given as to what performance indicators could be applied to meaningfully assess whether the Trust has, or is, acting in accordance with that mandate.

Another issue that would require more detailed analysis is whether it would be desirable for the Trust to receive an annual appropriation from the Government or lump sum contributions.

- If lump sum contributions are preferred, a model similar to the hypothecated investment funds announced in the 2008–09 Budget could be adopted with the Trust's funds to be managed by the Future Fund with an investment mandate that is geared towards the Trust's expected liquidity requirements. This would seem to be preferable than having the Trust set up its own funds management arrangements.
- A further permutation of the idea of the Trust would be to establish it along similar lines to a RDCs with a nominal levy applied to a specific group (potentially liable entities under the ETS) with a co-contribution from the Commonwealth Government (which would involve a regular income stream).
  - That is, the Trust would act as a pooling mechanism with a mandate, like the RDCs to invest in a portfolio of development and demonstration projects and ensure that the results and knowledge generated are shared.

Recommendation 6.2

The Government should consider establishing an independent investment vehicle – to be called the Carbon Technology Trust – with an overarching mandate to accelerate Australia's transition to a low carbon economy, by investing in the development and demonstration of a portfolio of technologies across the economy. The Trust would:

- *be subject to high level directions from the Government from time to time (similar to the Future Fund);*
- *be administered by an independent board that comprise experts in the fields of venture capital, finance, technology and public policy;*
- *have flexibility in its approach to contributing to different technology projects and leveraging private sector investment, potentially subject to some benchmarks, in building its technology portfolio;*
- *achieve an appropriate rate of return across its technology portfolio over time;*
- *have sufficient scope to participate in international projects in pursuit of its mandate;*
- *be time limited through a sunset provision; and*
- *act as a source of independent advice to Government on where there are structural or regulatory barriers to the development and demonstration (and even the deployment) of new technologies.*

6.5. Technology deployment

The Review sees a role for the Government in supporting the development and demonstration of low emissions technologies – including those associated with renewable energy – and in ensuring that investors in the deployment of these technologies are subject to sensible and consistent regulation. However, the case for direct subsidies for the deployment of low emissions technologies is less compelling, particularly following the introduction of the ETS, which will make investments in such technologies more attractive.

Notwithstanding this, the Government has programs that seek to promote the deployment of mature technologies, which would require high emission prices to be competitive in their own right.

- The main form of Government support for the renewable energy industry is the RET, which the Government has committed to expanding and making nationally consistent (see Chapter 7 for more detail). There are also plans to make different State based arrangements for solar feed-in-tariffs more consistent.
- This is in addition to subsidies offered by the Government for the installation of PV systems by households through programs such as the SHCP.

Box 6.4: CCS technologies

The concept of CCS involves:

- the **capture** of carbon dioxide at the point of combustion, such as a power plant, petroleum refinery or steelworks;
- its **separation** from other exhaust gases, such as nitrogen, oxygen and water vapour; and
- its **transport and injection** into a geological reservoir (geosequestration) – carbon dioxide can be transported using dedicated pipelines and has been piped over long distances in North America for enhanced oil recovery since the 1970s.

There are a wide range of processes being investigated in Australia and around the world for the separation of carbon dioxide from exhaust gases, called **post combustion capture**. Possible processes include the use of amine-based solvents, the use of cryogenics or absorption using pressure or temperature.

The separation of carbon dioxide can be facilitated by the **gasification** of a fuel before its combustion. Gasification is the process of converting a carbonaceous fuel, such as coal, petroleum or biomass, to a synthetic gas (syngas) composed of carbon monoxide and hydrogen.

- The syngas produced by gasification can be used for a variety of applications. It can be burned directly in an internal combustion engine or in a gas turbine; or it can be used as feedstock to produce other fuels and other products, such as synthetic diesel.
- The gasification process requires high temperatures (over 700°C) and oxygen. It has the advantage that it simplifies the problem of removing impurities and so can be used to produce energy from poor quality fuel, while controlling the release of noxious pollutants, such as mercury and sulphur dioxide.

Integrated gasification combined cycle (IGCC) is the gasification of coal to generate electricity. The syngas from the gasification process is burnt in a gas turbine and the waste heat is used to produce steam to drive a steam turbine. The advantage of this process is that the syngas can be reacted with steam to produce a mixture of carbon dioxide and hydrogen, which can be easily separated as the gas stream is at high pressure and the concentration of carbon dioxide is high.

An alternative approach that could be retrofitted to coal-fired power plants is **oxyfuel combustion**, also know as oxy-firing. Oxyfuel combustion is the combustion of a fuel in an oxygen rich atmosphere, rather than in air. Oxyfuel combustion produces higher temperatures than combustion in air and an exhaust stream rich in carbon dioxide.

Geosequestration is the injection of carbon dioxide into an underground geological formation. The carbon dioxide is compressed and injected under high pressure to force the gas into pore spaces in the rock. The pressures involved are sufficient to compress the carbon dioxide into a supercritical fluid, which reduces its volume and increases its ability to diffuse into the rock.

A range of different geological structures have been proposed for **carbon dioxide storage**.

Box 6.4: CCS technologies (continued)

They include: depleted oil and gas fields, deep unused saline aquifers (water saturated layers of rock), deep unmineable coal seams and large voids and cavities. The common feature that all of these geological structures require is a mechanism to trap the carbon dioxide within the rock. In most cases, this trapping mechanism would be a layer of impermeable rock above the reservoir.

An alternative is **geochemical trapping** where the carbon dioxide reacts with minerals in the underground reservoir to form stable carbonate minerals. A form of geochemical trapping is the injection of carbon dioxide into unmineable coal seams where the carbon dioxide adsorbs to the coal displacing methane, which can be recovered and used as a fuel (this process is called Enhanced Coal Bed Methane Recovery).

Of the various geological formations that could store carbon dioxide, deep saline aquifers offer the most potential for long term storage. These aquifers contain highly mineralized brines and have generally been considered to be of no value to humans. In a few cases, they have been used for storage of chemical waste.

- The main advantage of saline aquifers is their large potential storage volume and their common occurrence. The major disadvantage of saline aquifers is that, as yet, little is known about them.

The **Otway Basin Pilot Project** is the first demonstration of carbon dioxide injection and storage in Australia. The project is being developed by the CO2 Cooperative Research Centre and proposes to inject 100,000 tonnes of carbon dioxide over two years, beginning in April 2008.

In general terms, such assistance is not complementary to the ETS – as it either dictates (in the case of the RET or feed-in-tariffs) how part of the abatement task set by the scheme is to be achieved or distorts decisions about which abatement opportunities should be utilised. These forms of assistance add to the overall cost of abatement, rather than reducing it. If such measures are to be pursued in the presence of emissions trading, then it needs to be for other policy reasons and the effect on the ETS needs to be considered.

There may be other reasons – such as Australia's national interest – that provide a case for facilitating the accelerating the development of certain technologies. The Review considers that there may be a rationale for targeted Government assistance to promote the development, demonstration and commercialisation of carbon capture and storage technologies (CCS, see Box 6.4), both in Australia and internationally, given the strategic importance of coal, particularly black coal, to Australia's economy.

6.5.1. CCS

A necessary pre-condition for the deployment of CCS in Australia is the establishment of clear and nationally consistent regulation governing the transportation, injection and storage of carbon dioxide in geological reservoirs. The successful deployment and application of CCS in Australia will involve large scale, common use infrastructure and the transportation of carbon dioxide across State borders.

The Commonwealth is responsible for regulation of CCS in offshore waters and the States and Territories are responsible for the regulation of CCS on land. To achieve national consistency, the Ministerial Council on Mineral and Petroleum Resources has agreed guiding principles for CCS. The Commonwealth legislation covering sequestration in offshore waters, the Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008 was introduced into the House of Representatives on 18 June 2008. The States and Territories are at varying stages in the development of their regulatory regimes governing CCS.

- The Review endorses the progress made to date in providing a clear and nationally consistent regulatory framework governing CCS.

Applying principle 4 of the Review's principles for complementary policies, this would indicate that it would be preferable to have a single nationally consistent regulatory framework for CCS, administered by the Commonwealth.

Recommendation 6.3

To facilitate the deployment of carbon capture and storage technology, the Commonwealth Government should work through COAG to establish a nationally consistent regulatory system to govern the transport and geological storage of carbon dioxide which should cover, among other things:

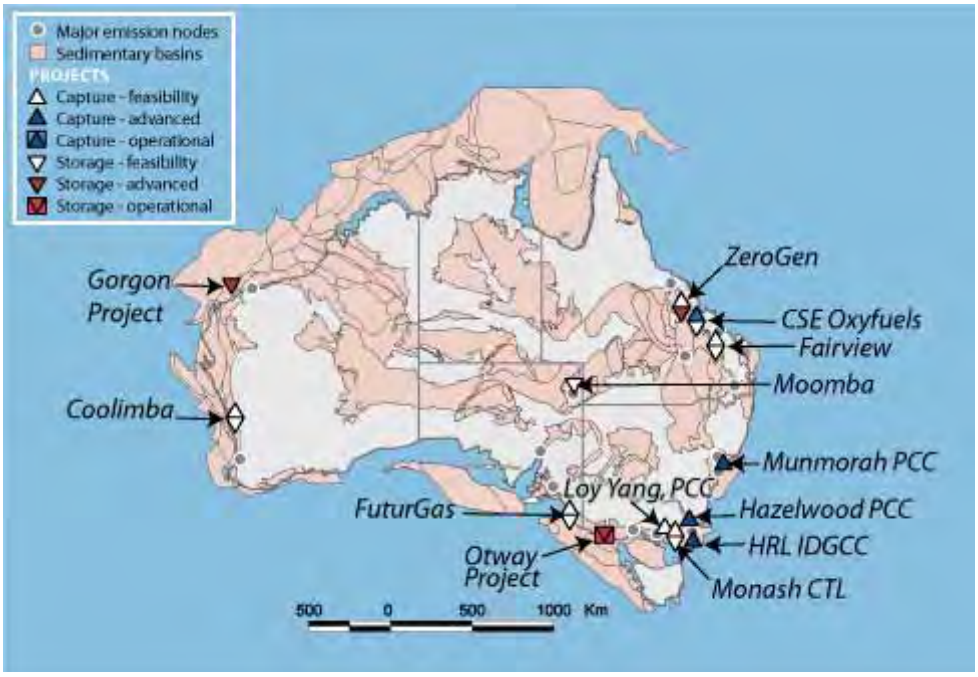
- *access and property rights;*
- *arrangements for assigning long-term liability for geological storage of carbon dioxide; and*
- *arrangements to cover the allocation of risk.*

6.5.2. Demonstrating CCS at scale

The energy supply sector is characterised by large investments in plants and facilities with long operational lives – these points apply in particular to CCS. The first project, or series of projects, which demonstrate the use of CCS on a commercial scale are likely to be costly with attendant financial risks for new technologies and little scope for recouping costs through product differentiation.

There are a range of demonstration projects proposed in Australia, but none are of a commercial scale (see Figure 6.1 below). The Government is providing one-off grants to several CCS pilot and demonstration projects through a range of programs, principally the LETDF. Future support will be provided through the National Clean Coal Fund. The Government's Green Paper reaffirmed its commitment to investing in CCS as part of the Electricity Sector Adjustment Scheme.

Figure 6.1: CCS projects in Australia



Source: CO2 CRC. Available from: http://www.co2crc.com.au/demo/ausprojects.html (accessed 20 July 2008).

The case for the Government going beyond its current support for CSS and contributing to a first of a kind commercial scale demonstration of CCS is finely balanced.

- While there are a range of companies and sectors with an interest in seeing the technology deployed, it is possible that any one company or group of companies will have insufficient incentive to justify the costs associated with being the first mover. Professor Garnaut makes this point in his draft report. Further, as noted above, finding ways to harness low emissions energy from coal is of strategic importance to Australia – both in terms of domestic electricity generation and future coal exports.
- However, this kind of investment by the Government runs the risk of creating expectations that it will subsidise similar projects for other technologies. It may also have the effect of putting off investment in alternatives to coal-fired electricity generation – particularly gas.

On balance, the Review considers that if the Government is to provide further support for the demonstration of CCS, it should do so at a commercial scale.

Discussions with government departments and industry representatives indicate that a large scale project to demonstrate the capture, transportation and geological storage of carbon dioxide is likely to take up to ten years to complete and to cost in the order of several billion dollars. It may be possible to supplement government funding for such a project with funding from the private sector, possibly from the coal industry, which has a significant stake in the outcome of the development of CCS technologies.

Such a project would require long term development and in particular, the identification and assessment of potential storage sites in different geological contexts. While not required for its establishment, the Review's proposed Carbon Technology Trust could provide a means of undertaking such a project.

Importantly, the Review does not envisage the Government owning and operating a commercial scale CCS project once it is successful. A clear exit strategy from the project for the Government would need to be built in to any governing agreements or contracts.

Recommendation 6.4

Given the strategic importance of Australian coal exports, the Government should ensure that commercial scale carbon capture and storage demonstration projects are in operation as soon as possible. This may require a significant increase in funding and work to streamline regulatory approvals.

6.6. Conclusion

Any solution to climate change will require the development and deployment of new technologies, particularly in the energy supply sector. Emissions trading will provide an incentive for the development and deployment of new technologies, but this 'market pull' may not be sufficient, by itself, to bring through the new technologies required.

There are spillover benefits from research and development, but their significance declines as a technology moves along the innovation chain from research to market. Technology development at the early stages of the innovation chain appears well supported by publicly funded programs and research organisations and there appears to be no need for specific support for low emissions technologies at these early stages.

There are also potentially significant 'first mover' spillovers at the demonstration and commercialisation stages of the innovation chain. On the basis of the potential for such spillovers, the Review considers that there is a role for government funding to support the demonstration and commercialisation of new low emissions technologies where the financial risks are high and the market pull from emissions trading may be weak.

In contrast to early stage research, however, these stages are not well supported by existing government programs that provide support for development of low emissions technologies. The Review has found that existing programs at the demonstration and commercialisation stages are not working effectively and the new programs established by the Government to fill this gap appear to be based on the model provided existing programs and as such, are likely to experience similar problems.

The Review, therefore, recommends the Government consider the establishment of a new entity – the Carbon Technology Trust – to invest in the development, demonstration and commercialisation of low emissions technologies. The mandate of the new entity should be broad and flexible enabling it to invest in technologies in any sector of the economy and to tailor its approach to individual projects, rather than simply providing grants or matching funds. Detailed design work will be required to establish the Trust and ensure it operates as intended, including careful consideration of the governance framework within which the Trust operates.

07

CHAPTER SEVEN:
ENERGY MARKETS AND INDUSTRY DEVELOPMENT

Summary

This chapter is concerned with what, if anything, the Government should do to facilitate the adjustment of the electricity sector to a low-carbon future beyond establishing an ETS. It reflects on existing Government support for the deployment of low emissions technologies, including plans for an expanded national RET, and outlines the Review's thinking in relation to the new structural adjustment measures outlined in the Government's Green Paper.

7.1. Introduction

Electricity is an essential component of Australia's economy and society. It accounts for approximately 35 per cent of Australia's greenhouse gas emissions[47]. Australia's success in reducing its greenhouse emissions will in large part depend on breaking the nexus between emissions and the generation of electricity.

Over time, the ETS will provide the 'market pull' that draws low emissions technologies – particularly renewable energy – into the electricity sector. That is, the ETS will increase the potential returns on investments in new technologies with lower emissions profiles by increasing the cost of established, higher emission technologies. In the short to medium term the sector will need to go through a significant process of adjustment.

This chapter is concerned with what, if anything, the Government should do to facilitate this adjustment, beyond establishing the ETS. The Government's options fall into three categories:

- Establishing **market frameworks** that provide an environment for investment and removing market barriers to the take-up of low emissions technology.
- Support for **technology deployment** – that is, assistance in addition to the market pull provided by the ETS and beyond support for the development and demonstration of new technologies (as was discussed in Chapter 6).
- **Structural adjustment assistance** to ameliorate the costs of transition – and thereby promote greater investor confidence in the sector – while not impeding its progress.

The role of the Government under each of these categories is discussed below, noting that they are all related in some way. Current support for technology deployment – such as the RET – creates implications for market rules and practices. Further, investors' expectations around the future regulation of the National Energy Market (NEM)[48] will affect their investment choices.

The Government's recent Green Paper announced its intention to provide structural adjustment assistance to the electricity sector through a new Electricity Sector Adjustment Scheme, and for structural adjustment support for businesses more generally through the Climate Change Action Fund.

47 DCC, 2008

48 Henceforth through the report, the Review uses the NEM as a shorthand term for all of Australia's electricity markets. The Review recognises that Western Australia is not part of the NEM.

- The Review has sought to provide the Government with some initial views on what these initiatives could include – within the context of the most appropriate role for the Government in this area and in light of its assessment of existing programs.

7.2. Market frameworks

The Review has suggested that the Government should rely on the ETS to achieve least cost abatement and only intervene where the market is not working efficiently. In other words, new low emissions technology in the electricity sector (specifically renewable energy sources) should only be supported by the removal of market impediments. In this context, the best thing that the Government could do for the renewable energy industry is to make sure that the rules and practices in the NEM do not impede the deployment of renewable energy.

7.2.1. Energy markets

The NEM has as its dominant paradigm large, baseload power stations feeding into a grid that spans a large geographic area. Electricity is transported vast distances and the grid needs to be maintained and safeguarded; it is the key to reliability and security of supply in Australia. But the future paradigm may be quite different: a much more distributed and varied portfolio of energy sources.

- Market reforms begun in the 1990s are changing the electricity network. Over the last ten years, most of the new electricity generation added to the system has been gas-fired intermediate or peaking capacity, supplemented by electricity generation from renewable sources, such as wind, as required under the RET (see Box 7.1).
- These smaller power plants have increased the number and geographic distribution of electricity generation in Australia. As a result, a different network including a greater number and variety of power stations is emerging that contrasts with the historic 'hub and spoke' model of an electricity grid built around large, baseload power stations.

The ETS will require this transformation to go much further and for this reason it is vital that the carbon price signal not be muted by unnecessary regulatory settings or subsidies.

- The Review is particularly concerned that the existence of regulated price caps in the retail electricity market may provide a potential barrier to the transmission of the carbon price signal to electricity consumers and constrain innovation by retailers. The ability of electricity consumers to manage their consumption within the context of retail price deregulation would also be assisted by the widespread installation of smart meters and in-house readers.
- The current market arrangements for electricity transmission and distribution may also create barriers to the entry of new electricity generation technologies, particularly generation from renewable sources of energy and barriers to distributed and embedded generation.
- Integration of greater renewable energy into the NEM will also create challenges in relation to transmission infrastructure and load management.

The Ministerial Council on Energy (MCE) is implementing reforms in these areas. However, progress has been slow and will need to be expedited and kept on track. The Review's proposed National Climate Change Compact between jurisdictions (see Chapter 3) may assist in re-invigorating reform in areas such as the NEM.

Recommendation 7.1

The Commonwealth Government, through COAG, should seek the agreement of all States and Territories, as soon as possible, to:

- *transfer all regulatory responsibilities for Australia's energy markets to the Australian Energy Regulator;*
- *accelerate the deregulation of retail electricity pricing to ensure that the price signal provided by the ETS is passed through to electricity consumers;*
- *begin the full rollout of smart meters to electricity consumers in all jurisdictions;*
- *accelerate the reform of electricity network connection and transmission pricing to ensure that they do not form a barrier to the entry into the market of new electricity generation; and*
- *accelerate the reform of the planning and pricing arrangements for distributed generation to recognise the benefits of distributed and embedded generation as an alternative to network augmentation.*

7.2.1.1. The retail energy market

A significant proportion of the energy market is regulated in relation to retail prices. Retailers compete by trying to maximise the amount of energy they sell into the market. As a consequence, there is no differentiation of services and prices, except at the margins. Further, the implicit incentives are skewed to encourage energy consumption.

The idea that retailers are selling energy services, including energy efficiency, is beginning to emerge, but will ultimately require contestability, price differentiation and probably some form of smart metering to become widespread. A more competitive and differentiated market of this sort opens possibilities for renewable energy and distributed generation as well as a greater focus on energy efficiency.

The MCE has requested the Australian Energy Market Commission (AEMC) review the effectiveness of retail competition in Victoria and South Australia.

- The AEMC has found that retail competition in Victoria is effective and has recommended that regulation of retail prices for residential customers cease from 1 January 2009. This recommendation will be considered by the Victorian Government.
- The AEMC has also released a draft report that finds that retail competition in South Australia is effective. The AEMC will release its final report on South Australia in the second half of 2008 and it is expected to review New South Wales in 2009 and, if required, the Australian Capital Territory in 2010. There is, as yet, no timetable for the other jurisdictions.

There is also no agreement by the States and Territories to either relinquish or transfer their retail price regulation powers to the Australian Energy Regulator. In the context of the ETS, this is a hazardous function for governments to retain.

- Governments will be under pressure to prevent any rise in electricity prices and therefore, the pass through of the carbon price. If governments do intervene through the regulation of retail prices, they may undermine confidence in both the carbon market and the energy market and stop investment in new electricity generation capacity and new technology. The result could be a recipe for a 'California meltdown'.

- The Commonwealth, State and Territory governments must work to establish effective competition in all retail markets to allow the deregulation of retail prices.

7.2.1.2. Barriers to distributed generation

Current market arrangements for electricity distribution may inhibit the entry of distributed and embedded electricity generation into the NEM.

The Garnaut Climate Change Review identifies the benefits of distributed and embedded generation as including: reduced transmission losses, deferred network augmentation and the higher value of electricity supplied during peak periods, particularly by PV systems. These benefits are inadequately recognised by the current regulatory framework, which encourages investment in network infrastructure by monopoly distribution companies[49].

However, the Review understands that new rules governing economic regulation of distribution networks took effect on 1 January 2008. These rules aim to remove incentives for networks to undervalue (or not spend money) on distributed generation and demand management. While it is too soon to judge the success of the new rules, they do represent a step in the right direction.

7.2.2. Transmission infrastructure

The problem for renewable energy is that, in many cases, the energy source is located far from the existing electricity transmission network or at the end of an existing transmission line that is congested by existing generation. Renewable energy, therefore, may often have a problem in getting the energy from where it is generated into the grid at a viable price.

Economically, there is a trade-off between the quality of the energy resource and the cost of building transmission lines. The Garnaut Climate Change Review identifies market failures associated with expansion and augmentation of the transmission network, particularly for 'first movers'[50].

Possible solutions may be some form of property rights over transmission infrastructure funded by first movers or, as the Garnaut Climate Change Review suggests, financial incentives funded by the Building Australia Fund and administered by the National Transmission Planner in the AEMC[51].

The issues involved are not straightforward. While subsidies or cross subsidies may encourage generation in new locations, it will be important that any new arrangements support efficient outcomes overall, balancing investment in networks and new generation.

7.2.2.1. Integration of renewable energy

In addition, new generation with different technical characteristics may need new power system management arrangements to ensure reliability and security of supply. This may require new market rules and the development of technical capabilities for system management.

- South Australia is already experiencing power system stability issues and network congestion as it moves to an installed wind capacity of around 850 MW (out of 1,800 MW nationally).

49 Garnaut, 2008, p 436

50 Garnaut, 2008, p 431-2

51 Garnaut, 2008, p 433-5

- If half of the expanded national RET were to be met by wind, then wind energy may expand by as much as 7,000 MW, increasing the need for further work on system integration.

The existing Wind Energy Forecasting Capability initiative has improved the National Electricity Market Management Company's (NEMMCO's) power system management capability, reducing the overall system costs of integrating this wind resource. If the penetration of intermittent generation increases, the value of more accurate forecasts will also increase.

On this basis, there is likely to be a case for funding renewable energy integration measures and tools that reduce system-wide costs, improve transparency for investors in renewables, and improve the capability of the power system to efficiently meet expected growth in the availability of renewable energy.

- Such work could encompass development of measures and tools to better understand the effect of increasing generation from renewable energy sources on the electricity network or promote the use of technologies that increase the ability of the electricity system to manage renewable energy uptake efficiently.
  - It may also include examination of the need for new transmission infrastructure and the justification for public investment.
- Similarly, there is an information barrier for new generators in estimating network congestion, which would affect all new generation investment decisions and network development planning in response to the ETS and the expanded national RET, potentially increasing costs. Development of tools to meet this need may assist in preventing a repeat of the rapid, concentrated wind investment that contributes to the emerging network congestion in South Australia.

The Review considers that such measures would be consistent with the Government's stated goals for its new Electricity Sector Adjustment Scheme (discussed below) and should therefore be funded as a sub-program under that scheme.

7.2.2.2. Accelerating reform

On 13 June 2008, the MCE announced that the AEMC will undertake a review of the electricity and gas markets in Australia that will examine the issues around electricity transmission and the barriers to entry for new electricity generation technologies. The Review welcomes this announcement as an important development.

However, the Review considers that more needs to be done. In the short term, reform of retail price regulation and the market arrangements governing transmission and distributed and embedded generation are critical. In the longer term, the Government needs to consider how the electricity network is likely to change under the combined pressures of emissions trading, market reform and new technologies.

The Review's proposed National Climate Change Compact between jurisdictions (see Chapter 3) may assist in developing a nationally coordinated approach to climate change and also in re-invigorating reform in areas such as the NEM. One of the options which COAG may need to consider is the circumstances (such as incentive payments) in which States and Territories would be willing to refer regulatory powers to the Commonwealth Government.

7.3. Technology deployment and industry development

As discussed in Chapter 6, the Review sees a role for the Government in supporting the development and demonstration of low emissions technologies – including renewable energy technologies – and in ensuring that investors in the deployment of these technologies are subject to sensible and consistent regulation.

However, the case for direct subsidies for the deployment of low emissions technologies is less compelling particularly following the introduction of the ETS. Support for deployment is effectively industry development assistance.

Existing programs have essentially tried to support the development of a renewable energy industry by creating demand for a product, promoting fuel switching or subsidising the cost of capital investment and other business inputs.

All levels of government provide support for the renewables industry. It is delivered through three main avenues:

- Research and development grants and institutional support (that is CSIRO and universities);
- Cross subsidies to support renewable technology – the RET and FITs.
  - the Government is developing a nationally consistent regime for the RET and FITs.
- Subsidy and rebate programs for solar technology. For example, subsidies to install PV systems by households through programs such as SHCP.
  - SHCP has historically not been means-tested, although a household income cap was introduced in the 2008-09 Budget. This brought SCHP into line with the existing means-testing of the Solar Hot Water Rebate program.

In general terms, such assistance, other than research and development support, is not considered complementary to the ETS. It either dictates (in the case of the RET and FITs) how part of the abatement task set by the scheme is to be achieved or distorts decisions about which abatement opportunities should be utilised (that is, it displaces potentially cheaper forms of abatement).

Such measures add to the overall cost of abatement rather than reducing it. If these measures are to be pursued in the presence of emissions trading, then it needs to be for other policy reasons and the impact on the ETS must be considered (principle 3).

Box 7.1: The Renewable Energy Target

The RET establishes a legal liability on wholesale buyers of electricity to purchase a certain quantity of electricity generated from approved renewable sources. From 2010 to 2020, wholesale buyers of electricity are required to obtain an additional 9,500 GWh of electricity from renewable sources each year. Interim targets apply from 1 April 2001, when the RET came into force, until 2010. The RET is established under Commonwealth legislation administered by the Office of the Renewable Energy Regulator (ORER), a statutory agency.

The RET has been established to support the development of the renewable energy industry in Australia by enabling a higher price for electricity generated from renewable energy sources, than electricity generated from fossil fuels. The RET does not specify any particular renewable energy technology or renewable energy source; it allows all renewable energy technologies to compete for the market established by the scheme.

During the 2007 election campaign, the Government announced that it would require 20 per cent of electricity generation in 2020 to be generated from renewable energy sources. The Government's policy requires an additional 45,000 GWh of electricity from renewable sources in 2020. The expanded national RET is to be phased out between 2020 and 2030.

On 2 July 2008, the COAG Working Group on Climate Change and Water released a discussion paper outlining issues to be considered in implementing and designing the RET. Two approaches were identified.

- Approach 1 is based closely on the existing RET scheme. Its primary focus is on achieving the 2020 target at least cost. It creates a strong investment incentive early in the scheme and encourages the early creation of Renewable Energy Certificates (RECs) that can be used in future years to help minimise the price of RECs over the duration of the scheme.
- Approach 2 seeks to balance the least-cost considerations outlined under Approach 1 with managing the risk that, while all targets are met, an additional 45 000 GWh of renewable electricity is not generated in 2020. This approach seeks to encourage a smoother investment profile to help bring forward new technologies in the latter part of the scheme.

The Review prefers Approach 2 as it has greater scope to bring a range of renewable technologies to market, while Approach 1 is likely to favour wind over other renewable energy sources. This approach may also simplify the task of removing other duplicative industry assistance measures, such as SHCP and solar FITs.

7.3.1. Expanded national RET

The expanded RET aims to build the renewable industry by requiring a certain proportion of electricity to be generated from renewable sources. It is effectively a cross-subsidy that has proved effective in the past in developing the industry (especially wind), but at some economic cost. To minimise the future economic cost, it should be technology neutral and nationally consistent.

The Government's plans to expand RET were consistently raised with the Review in consultations meetings and submissions with a range of views canvassed. Views and submissions were largely divided along the lines that would intuitively be expected with many renewable industry participants

and representatives in support of the RET and those outside of the industry (particularly electricity users) opposing it. Submissions by the Clean Energy Council and Australia Petroleum Processing and Exploration Association are good examples of these two opposing views.

There are three main arguments put forward in support of a renewable energy target in addition to an ETS:

- **Industry development** – arguments around industry development hinge on the notion that Australia will need a supply of renewable energy in the future and that the incentive provided by the ETS will be insufficient to deliver this. A related argument is the perceived need to accelerate the deployment of renewable energy beyond what the ETS would deliver.
- **Energy security** – the argument is that without the RET, an ETS would lead Australia to switch from coal fired electricity generation to gas and in the longer term from gas to some, as yet unidentified, alternative. Under this argument, RET helps to smooth domestic consumption of gas reserves and make more gas available for export, by bringing on stream a greater quantity of renewable energy. This argument relies heavily on assumptions about investment in renewable energy, particularly wind, and their possible deployment in the NEM.
- **Abatement** – with an ETS, arguments that the RET helps achieve abatement that would not occur otherwise are only tenable if the abatement task set under the ETS is below that of the RET (noting that what is important is the task over time not necessarily year on year emissions caps).

While there are a variety of opinions on this matter, the Review considers that schemes such as the RET, FITs and demand driven subsidies for the deployment of solar power are not complementary to an ETS. They will, as discussed recently by the Productivity Commission[52], add to the cost of achieving an abatement target rather than producing additional abatement. The Review would concur with the Productivity Commission's analysis that the RET is likely to add to the cost of abatement, and would not be complementary.

However, the Review recognises that the RET is an important Government election commitment. To minimise the negative impact from its implementation, the Review proposes that it be technology neutral to the extent possible, and all other overlapping and duplicative measures be phased out.

7.3.2. Solar energy

In addition to support through the RET and FITs, the renewables industry, particularly solar, is the beneficiary of a number of different subsidies and rebates. The programs that governments (throughout Australia) collectively have for supporting solar energy are confused and duplicative.

The main forms of assistance of solar energy are:

- The Commonwealth Government provides rebates (means tested where grid connected) for the installation of PV panels.
- Various governments provide rebates for the installation of solar hot water systems.
- Some States and Territories have created systems of FITs that provide a guaranteed price for the energy generated from the grid connected PV panels. These systems of FITs differ from one another (see Box 7.2).

52 Productivity Commission, 2008.

- The Commonwealth Government will mandate the deployment of renewable energy through the RET.
- There are also potential tax offsets depending on who deploys solar energy and under what circumstances.

The price of solar energy is high compared with other sources of energy (including other renewable energy such as wind power). Although many commentators foreshadow that the price will fall rapidly, it is not likely that the effect of an ETS would bring solar energy into the market in the immediate future. Some estimate PV would require a price of at least $300 per tonne of carbon.

Solar energy does have significant advantages, at least potentially, apart from it being a clean source of power. First it is modular – it can be employed at various scales. Second, it can be deployed in a lot of different places (including in remote locations). Third, it can be located close to users and even within the grid so that transportation is not a major issue.

The most likely form of commercial solar energy would be through the deployment of solar thermal power stations, not PV panels.

What would be the best thing for Governments to do for solar energy? In the Review's view there is a case for support for research and development as outlined in Chapter 6. The Government has a range of programs that do this, including the recently announced $500 million Renewable Energy Fund. Further, access to the NEM is important, ensuring that the rules of the energy markets do not discriminate against solar energy.

Solar Cities program is also useful. This program is funding trials of integrating distributed solar technologies with pricing and demand management measures in grid connected urban areas around Australia.

The use of rebates to specifically support the installation of PV panels by households is an expensive way to support an established technology. Rebate programs require people to opt in and have access to capital, and hence relatively few people take them up. Existing programs have supported the installation of around 16,000 PV panels around Australia over the past eight years, but they have not transformed the PV industry into one that can stand alone without continued government support.

The ongoing use of rebates has downsides for the industry as well. Whilst they benefit from the assistance, rebates bring uncertainty in that they are subject to Budget decisions and often a boom and bust outcome for the industry, which is difficult for companies to manage.

The Review has suggested that the Government look at a more technology neutral approach to assisting households – for example through providing tax rebates from households up to a certain amount over time. This would be a way of recycling revenue raised through auctioning of permits. Households could use this to subsidise PV panels or other solutions such as solar hot water systems, insulation or a range of other ways in which they could make their homes more energy efficient. But, importantly, the choice would be theirs. Assistance for households is discussed in more detail in Chapter 5.

Box 7.2: Feed in tariffs

FITs are prices set by government regulation for electricity generated from certain, specified sources for a defined period of time. Electricity distributors or retailers are required to purchase all electricity produced from eligible sources covered by the FIT.

- FITs are a cross subsidy from electricity consumers, who do not own PV systems, to those that do. To the extent that owners of PV systems are typically in higher income brackets, a feed-in-tariff is also regressive.
- FITs constrain market flexibility by fixing the price of certain electricity for long periods of time. In this respect, they are less flexible and may be more costly than mandatory quotas, such as the expanded national RET.

FITs are well established in Germany where they have driven the expansion of electricity generation from renewable sources. The highest FIT rates apply to solar PV systems. In its country review of Germany in 2007, the IEA found that FITs for PV produce abatement which is between 30 to 50 times more expensive than energy efficiency retrofits of buildings[53].

In assessing Germany's FIT scheme, the IEA concluded that a mandatory quota scheme for renewable energy, such as Australia's RET scheme, is preferable to a FIT because it forces different renewable energy sources and technologies to compete for the market created by the scheme[54].

Three States and the ACT either have FITs in place or have announced plans to introduce them. South Australia, Queensland and Victoria have announced FITs for electricity generated from PV systems for periods of 15 (Victoria) and 20 years (South Australia and Queensland). The Victorian and South Australian schemes are limited to PV systems up to certain maximum sizes. The Australian Capital Territory (ACT) has announced a FIT for all renewable energy sources for a period of twenty years. Tasmania is considering whether to establish a FIT.

- The FITs in South Australia, Queensland and Victoria are applied to the electricity sent to the grid (called a 'net' tariff) as opposed to the total amount of electricity generated (a 'gross' tariff). The ACT scheme is proposed to be a gross tariff.

The Government has committed to working with the States and Territories to develop a nationally consistent approach to FITs through the COAG Working Group on Climate Change and Water.

The Review does not support the use of FITs. FITs have proved expensive in Europe, compared with other forms of abatement. They are also normally designed as cross subsidies, rather than government grants, which reduces their transparency. Energy users are effectively paying for the higher cost – around the same time as pressure is exerted on energy prices by the introduction of emissions trading. If this type of program is an industry assistance measure and is in the public interest, it should be paid for by taxpayers through the Budget. FITs are also technology specific, rather treating all technologies equally.

If governments were minded to continue some form of FIT, they might consider these issues. The expanded RET will provide significant support with more certainty than the current rebate programs. The Review's preferred Approach 2 will allow new solar technologies to be brought into the scheme over time.

53 IEA, 2007
54 ibid

In the longer term, if the Government is minded to continue supporting the renewable energy industry, in addition to introducing the ETS, it would be preferable that such assistance be provided through the Budget – either in the form of grants to support uptake from a menu of options, or through the tax system – rather than through a cross subsidy. Any measures should be technology neutral to the greatest extent possible.

Recommendation 7.2

In proceeding with the implementation of an expanded national RET, the Government should phase out superseded subsidy and rebate measures that support the renewables industry.

7.4. Structural adjustment

There may be a role for government to assist business to adjust to a carbon constrained economy. Programs should focus on overcoming information and capability barriers to industry adjustment, being mindful of any consequences for the carbon market.

Programs to assist business adapt to the ETS should provide practical, targeted information on how they can modify or reduce their energy use. The information needs to be specific to the needs of a business and provided in a way that reaches the target businesses in an acceptable way.

The Government's Green Paper indicated a predisposition to provide structural adjustment support through two new schemes: the Electricity Sector Adjustment Scheme (ESAS) and the Climate Change Action Fund (CCAF). These are canvassed in more detail in Appendix 4.

The central challenge of structural adjustment assistance is to avoid undermining the incentives that the scheme is intended to provide. Further, in an economy close to full employment, the potential for government intervention to distort the allocation of resources away from their highest value use is more significant than at other times.

Provided both measures are only transitional, the Review considers that there are activities they could undertake that would increase, rather than undermine, the ability of the ETS to drive least cost reductions in Australia's emissions.

7.4.1. Electricity Sector Adjustment Scheme

The Green Paper indicated that the Government is disposed to deliver a 'limited amount of direct assistance to existing coal-fired electricity generators' through the ESAS, which would also deliver support to other, related strongly-affected industries, workers and communities. The Review considers that the ESAS could have a broader role to facilitate the transformation of Australia's electricity sector in response to the ETS.

The Green Paper also indicated that the ESAS would seek to:

- underpin investor confidence in the sector;
- facilitate structural adjustment; and
- ensure longer-term energy security.

The Review's initial thinking is that the ESAS could have three components:

- The **expanded national RET** – reflecting that the RET is essentially an industry development initiative for renewable energy, it could be brought under the auspices of the ESAS. This would not necessarily require any legislative or administrative changes, more a re-branding of the RET to more clearly identify it as part of the Government's assistance to the renewable energy industry. (This could potentially help to mitigate calls for further assistance.)
- A **Renewable Energy Integration Initiative** (REII) – the REII would fund activities to assist in the successful integration of a larger amount of renewable energy into electricity networks – as discussed above. For example, the REII could fund investment in better energy forecasting techniques and technologies and the development of technical standards and codes.
  - The REII could be modelled on the existing Wind Energy Forecasting Capacity program, but would cover renewable energy more generally.
- **Adjustment Assistance Allowances** – could take the form of grants, tax rebates or free permits to strongly affected firms, individuals and communities.
  - As noted in the Green Paper, 'different delivery mechanisms may be required for different elements of the ESAS'.

There would also be synergies between the ESAS and the Review's proposed Carbon Technology Trust, which will invest in the development and demonstration of low emissions technologies in the electricity sector – among other things – and possibly also in any commercial scale CCS demonstration project.

The National Climate Change Compact could also help to support investor confidence in the electricity sector by clarifying roles and responsibilities on climate change generally and by facilitating energy market reform.

7.4.2. Climate Change Action Fund

The Government's Green Paper outlined that the CCAF would provide businesses with 'partnership funding' to support:

- capital investment in innovative new low emissions processes;
- industrial energy efficiency projects with long payback periods; and
- dissemination of best and innovation practice among small to medium sized enterprises.

The Review has interpreted the objective of the CCAF as being to facilitate the restructuring of business inputs – labour and capital – following the introduction of a carbon price. The businesses being targeted are those in sectors or industries not receiving free permit allocation and are not part of the ESAS (see above).

In particular, the CCAF could incorporate the Review's suggestions around the use of the tax system to provide support for businesses renewing capital stock in adjusting to higher energy prices (see Chapter 8).

Consistent with the Green Paper, the Review would see the CCAF having three components – information provision, support to facilitate business restructuring, possibly delivered as subsidies in the form of tax rebates or grants and capacity building.

- The exact approach would need to be determined in line with the underlying market failure or issue that needed to be resolved.

The CCAF would have four main elements:

- **Climate Action in Enterprise** – a program modelled on Greenhouse Challenge Plus that disseminates 'best practice' to small and medium size enterprises;
- **Energy Efficiency Opportunities** – the existing program, which could be expanded – for example, it could be voluntary for businesses currently under the threshold of 0.5 PJ;
- **The Climate Action Tax Concession** – businesses would be entitled to a tax rebate (or accelerated depreciation or investment allowance) in respect of a certain percentage of the costs of implementing energy efficiency improvements. Entitlements could be subject to an annual cap or an overall limit (among other things);
- **The Greener Skills Initiative** – this initiative would support:
  - retraining and up-skilling in a range of professions including, engineering, industrial design, environmental sciences, energy auditors etc. The exact delivery mechanism would differ between professions and would need to work in concert with broader education and training reforms;
  - accreditation of energy auditors and other 'green' professionals, which could be done directly by the Government or in partnership with industry associations.

In addition to utilising the existing EEO program and experience with the Greenhouse Challenge Plus program, two elements of the Government's Clean Business Australia initiative – the Green Building Fund and Retooling for Climate Change – could be subsumed into the CCAF. Both are directed at different aspects of the kind of structural adjustment the CCAF is intended to be address.

7.5. Conclusion

As with any major economic reform, the introduction of the ETS will benefit parts of some sectors of the economy and require others to undertake significant change. The Government's primary role in facilitating this process of adjustment is to ensure that market frameworks allow, and do not inhibit, the flow of resources to their highest value use.

- The regulation of the NEM and future regulatory arrangements around CCS will be particularly important in this context.

The ETS itself will provide significant support to the development of a sustainable renewable energy industry by increasing the relative price of emission intensive electricity. Measures such as the RET and FITs further underpin demand for renewables, but are not least cost. In addition subsidies and rebates further shield the sector from improving its productivity and efficiency.

Given the significant assistance already provided to the renewable energy sector, the Review recommends that overlapping and duplicative assistance measures be phased out, and government action be refocused to facilitate industry to adapt to a carbon constrained world.

08

CHAPTER EIGHT:
OTHER MARKETS

Summary

The Government cannot craft a coherent and effective response to climate change in isolation from its policies in other areas – that is, its intervention in other markets. This chapter discusses how the Government's policies in respect of specific sectors of the economy, and position on microeconomic reform, may affect the operation of the ETS.

8.1. Introduction

An overarching theme of the Review is that the ETS should be allowed to work. A consequence of this is that policies or programs which impede the ability of the ETS to drive least cost emissions reductions should be amended. This is broader than just existing programs which seek to promote abatement. While the ETS will set the carbon price, settings in other markets will determine whether that price signal is able to be effective in promoting least-cost emissions reductions.

From this perspective, reforms in other markets may be able to assist the ETS to achieve its purpose – the most pertinent example is energy market reform, as was discussed in Chapter 7. Microeconomic reform more broadly – particularly in relation to the tax system – can also be seen as a complementary measure as a more flexible and productive economy will be better able to cope with the transformation to a low-carbon future.

This chapter discusses a number of issues related to other markets that have not been canvassed in other chapters. These relate to issues around productivity, taxation, transport, agriculture and environmental protection and planning.

8.2. Productivity

Recommendation 8.1

The Government should recognise that pricing distortions in other markets may prevent least cost mitigation (that is, impede the effective operation of the ETS). Continued pursuit of structural reform and improved efficiency in the economy (including in energy, transport and water markets) will support the achievement of least cost emissions reductions.

A well functioning economy depends on resources being employed where they are most valued, as represented in the price they are able to attract from different uses. For example, the mining boom is currently attracting large amounts of capital investment and labour from other sectors within the economy in response to the returns and wages made possible by the current value of Australia's commodities.

The introduction of a carbon price will make goods and services that are carbon intensive relatively more expensive. A more flexible economy is better placed to manage the significant adjustments associated with this kind of long-term change in relative prices. This is why the Review is concerned with markets other than the ETS.

Reform in other markets will have a significant impact on Australia's capacity to reduce carbon emissions at least cost, as well as contributing to improvements in the overall productivity of the economy. That is, there are good reasons to progress reforms in pursuit of national markets for energy, transport and water which make even more sense in light of the introduction of an ETS.

A key challenge for the Government in these other markets, as in the ETS, is to allow the market to set the price of activities. If there are policy imperatives around equity, industry development or regional policy, these should be progressed through explicit subsidies and not through distorting prices in the market, through arrangements such as cross subsidies.

8.3. Taxation

Recommendation 8.2

The Government's Australia's Future Tax System Review should consider:

- *options for reforming those aspects of the tax system that act as disincentives for individuals and companies to reduce their greenhouse gas emissions; and*
- *the potential merit of using the tax system to support the investment in new capital, by both businesses and households, that will be incurred over an extended period of time as Australia transitions to a low carbon economy.*

8.3.1. The role of the tax system

Australia's tax system not only raises revenue to fund public services, it plays a significant role in shaping the production and consumption decisions of individuals and businesses.

Tax reforms that help to improve the flexibility of the economy will support the ability of the ETS to drive least cost emissions reductions and Australia's transformation to a low carbon economy. More specifically, it would be preferable for the tax system not to mute the carbon price signal – by providing incentives to generate emissions that would otherwise be abated – and rather enhance the ability of the economy to respond to it.

In recognition of this, the Government has tasked the AFTS Review with examining and making recommendations on a 'tax structure that will position Australia to deal with the demographic, social, economic and environmental challenges of the 21st century'. As part of this exercise, the AFTS Review is expected to consider the interrelationship between all relevant aspects of the tax system and the Government's proposed ETS.

This Review does not intend to duplicate that exercise. However, there are a range of issues raised, and ideas that have emerged, in the context of this Review that are outlined below for the AFTS Review's further consideration.

8.3.2. Removing existing distortions

There are currently a number of taxation arrangements which arguably create incentives to undertake behaviour that could increase greenhouse emissions. Such arrangements have the potential to mute the carbon price signal from the ETS. It would therefore be appropriate for the Government to consider whether they should be retained or modified in some way.

The example most frequently cited, in submissions to the Review and in public debate, is the fringe benefits tax (FBT) exemptions associated with company cars. Similar FBT concessions are also available in respect of car parking, taxi use and standby air travel. While the exact extent to which these FBT concessions distort decision making is difficult to determine with precision, they do create greater incentives to drive (or fly) than would otherwise be the case, and hence lead to greater emissions from these activities.

> The Australian Conservation Foundation's submission to the Review provides a summary of the arguments commonly put forward in support of the abolition of these FBT concessions.

The fuel tax credit scheme, which provides some businesses with a tax credit in respect tax they pay on fuel, has also been cited to the Review as a potential distortion in the tax system. This raises issues around fuel tax more broadly which will be one of the more vexed issues which the AFTS Review will have to consider.

Of direct relevance to this Review is the fact that businesses can currently only claim fuel tax credits of more than $3 million if they are a member of the Greenhouse Challenge Plus program under which they must report their emissions. As outlined in Appendix 4, the Review is recommending that the program not be continued on the basis that it will be superseded by the ETS – that is, the ETS will provide businesses currently participating in the program with incentives to reduce their emissions.

The FBT exemptions and fuel tax arrangements are often cited as examples of implicit subsidies for fossil fuel use[55]. To the extent that it can be shown that these and other subsidies have the effect of providing an incentive to increase the use of fossil fuels then the Government should consider whether they can continue to be justified. However, the real or perceived existence of subsidies for fossil fuel use is not in the Review's opinion a compelling justification for subsidising the use of renewable energy as well.

Tax arrangements which distort investment decisions with respect to land use may also be problematic depending on how and when forestry, land use and agriculture are covered by the scheme. On the basis that they are covered, the Review has concluded that the recently introduced accelerated depreciation arrangements for Carbon Sink Forests should not be extended beyond the current legislated end date of 2011-12 (that is, the status quo should be maintained) and, if possible, should cease sooner.

8.3.3. Tax concessions instead of outlays

The Review's Terms of Reference require it to consider the appropriateness and effectiveness of mechanisms for the delivery of government assistance associated with climate change – including tax concessions. As discussed above, a simple, efficient and equitable tax system is in itself a complementary measure.

55 Reidy, 2007

The ETS is not intended to be a means of raising revenue. As the Government has already indicated in its Green Paper, revenue raised by auctioning emission units should be returned to business and consumers.

Australia's transition to a low carbon economy will require a large renewal of its capital stock over an extended period of time. The Review considers that the carbon price should be the primary driver for determining the timing and nature of this capital investment, rather than individual perceptions of who should be adopting which technologies and when.

Nonetheless, the Government may have a role in facilitating this process of capital renewal – both for businesses and households. In this context, consideration could be given to the potential merits of making greater use of the tax system in providing such support (provided there is a demonstrable net benefit to the community from doing so).

- While the Review has not undertaken any modelling of potential revenue streams from the auctioning of emissions units, intuitively it is possible that the trajectory of the revenue stream will be broadly in line with the need for capital renewal in the economy.
- Revenue from the auctioning of permits under the ETS would be expected to rise initially but would eventually fall as technological breakthroughs occur and those technologies are widely deployed, making the task of reducing emissions easier. It is the deployment of these new technologies that require businesses to turn over their capital.

The idea that the tax system may be a better policy instrument in this area reflects the assessment of outlay programs undertaken as part of the Review.

- Despite their advantages in terms of budgetary transparency, outlay programs require expenditure to be incurred in a particular period of time and for a specific purpose – this is one of their advantages as a tool of government.
- However, it means that they are arguably less suited to a situation where the Government's aim is to ease capital constraints on businesses and households over an extended period of time, rather than within a specific budgetary window.

In particular, the Government may like to consider providing accelerated depreciation or an investments allowance in respect of capital items purchased by businesses in order to reduce their emissions. For example, this could include capital expenditure incurred in relation to retooling manufacturing plants or retrofitting existing commercial buildings.

Existing (or future) support for the renewables industry could be replaced by accelerated depreciation or an investment allowance on new power plants that deploy renewable or low emissions technology. While regulation is an appropriate tool in some circumstance, measures such as the RET impose a cost on the community which is not transparently disclosed – as was discussed in Chapter 7.

- Providing broad based assistance for capital expenditure associated with renewable energy projects through the tax system, or even through an outlays program, would at least have the advantage of facilitating greater scrutiny of the degree of assistance being provided to such groups. It would also arguably create less of a distortion as far as the ETS is concerned as investment in renewable energy would be subsidised but not mandated.

The Review acknowledges that there are significant practical difficulties in designing a workable arrangement for providing accelerated depreciation or an investment (or development) allowance for a range of capital investments businesses may chose to make in response to a carbon price or as an alternative to existing support for the renewable energy industry. These difficulties relate primarily to:

- defining eligibility criteria that is sufficiently broad to capture the kinds of investments the Government may wish to support balanced against the need to ensure that the concession is not abused;
- enshrining these criteria in legislation; and
- putting in place arrangements for enforcement and administration of the legislation.

An investment allowance may have some advantages over accelerated depreciation in terms of both the ability to target assistance and the ability to monitor its use. Based on past experience, an investment allowance could be structured to limit eligibility to investments over a certain threshold. Further, whereas accelerated depreciation would be reported as part of the general depreciation claimed by a business, an investment or development allowance could be structured to require projects or investments to be registered in order to qualify for assistance (noting that this would increase complexity and compliance costs).

As noted above, some (and probably a large part) of the revenue raised through the auctioning of permits will need to be returned to consumers. As part of broader measures to achieve this through the income tax system, the Government could consider providing tax rebates for individuals or households – targeting low income households in particular – to support capital investment in one-off energy efficiency improvements.

- The rebate could be capped at a certain amount and could be claimed over a period of years with a limit on the amount that could be claimed in any one year. The Review notes that there would also be practical difficulties in designing such an arrangement, similar to those outlined above in relation to accelerated depreciation or an investment allowance.

Ultimately these will be matters for the AFTS Review, rather than this Review, to advise the Government on.

8.4. Transport

Recommendation 8.3

The Government should recognise that pricing distortions in transport markets may prevent least cost mitigation. Continued pursuit of improved efficiency in the transport sector will assist to achieve least cost emissions reductions.

The Commonwealth should continue to work with the States and Territories through COAG to establish a national approach to regulation, planning and public investment in:

- *freight transport – which should include reforms to road user charges, to facilitate clearer price signals between different modes of transport, and to infrastructure planning and investment to better integrate different modes of transport; and*
- *passenger transport – focussing particularly on the need for investment in public transport infrastructure in urban areas and integrated transport planning.*

8.4.1. ETS coverage

The transport sector is a challenging area for government policy, but it also has some clear and simple elements. The price of fuel will create incentives for technological change, both in the design of vehicles and in the supply of fuel, because consumers will increasingly demand and choose lower cost options.

The Intergovernmental Panel on Climate Change (IPCC) reports that there is significant potential for emissions reductions in transport at low cost, particularly in the context of high oil prices[56].

Transport is also one of the fastest growing sectors for emissions in Australia[57]. For this reason, the Review supports the Government's intention to include the sector in the ETS.

- Consumers should not be shielded from the carbon price signal if they are to change their behaviour to reduce their emissions. Governments must allow the market to reflect the true costs of providing goods and services and also allow the market to determine the most efficient use of those goods and services.
- Where the outcomes of the transport market fail to meet other important policy objectives, such as equity, then governments should provide incentives through taxation, grants or explicit subsidies; not through market distortions and cross subsidies in the market. Reacting to community sensitivities around fuel prices by excluding the sector will be more costly in the long term as other sectors of the economy are required to bear a greater proportion of the necessary emission reductions.

8.4.2. Regulation and pricing

Transport markets in Australia are rife with perverse incentives and built-in inertia. Over the years, governments have created a range of subsidies and tax incentives for producers and users of fuels and motor vehicles.

There are a range of government policies and regulations at both the Commonwealth and State and Territory levels that could actually work against, and effectively undermine, the carbon market. Perversely, these policies and regulations will make it more expensive for Australia to achieve its carbon reduction objectives.

Governments should focus on areas where non-complementary measures operate in the transport sector. Some major areas to improve land transport infrastructure development and use involve harmonising road and rail freight regulation and developing more direct road pricing.

- For example, the regulation of interstate rail freight is characterised by overlapping and duplicative responsibilities. The Exports and Infrastructure Taskforce found that an operator of interstate trains could have to deal with: seven rail safety regulators with nine different pieces of legislation; three transport accident investigators; fifteen pieces of legislation covering occupational health and safety of rail operations; six access regulators; and 75 pieces of legislation with powers over environmental management[58].

56 IPCC, 2007
57 Australian Greenhouse Office 2008, p. 8
58 Exports and Infrastructure Taskforce, 2005, p.49.

These problems are gaining recognition with Commonwealth, State and Territory Governments. The Australian Transport Commission, composed of Australian and New Zealand transport ministers, announced on 2 May 2008 that it would consider proposals for a single national system for the regulation, registration and licensing of heavy vehicles, a national rail safety regulator and a national rail safety investigator[59]. This is a welcome development and the Review endorses the progress that is being made to achieve the vision of a seamless, coordinated, national transport system.

There are also a range of difficult political issues around the pricing and provision of private versus public transport options. Neither option is optimally priced for efficient emission reductions. Roads and parking are not properly priced for the private motorist and this, together with the lack of availability and accessibility of public transport means that the incentives and choices facing motorists are the opposite of those the Government is seeking to establish through introducing a carbon price.

However, reducing travel demand will be a tough ask for Australia's low density cities. Population growth in most of our major cities is still strong and the demand for lower cost housing is most readily met on the suburban periphery. Any response will require some form of demand management during peak periods but will also very likely require better land use planning.

8.4.3. Infrastructure

The levels of congestion on Australian roads are more than twice those of most OECD countries[60]. This reflects, in part, historic underinvestment in infrastructure in Australia. Measures to reduce congestion could include the use of intelligent transport systems to manage transport networks, road use tolls, congestion charges and increased parking charges[61]. In the long term, the most powerful complementary measures in transport are likely to centre on infrastructure, planning and urban design. For example, a major barrier to public transport use is its availability in outer suburban areas and the capacity of the system.

- In Melbourne, patronage of the city's train system has increased substantially in response to higher fuel prices and the system is close to its maximum capacity on some suburban lines[62].
- Transport infrastructure investment is relevant to both mitigation and adaptation as it both constrains the choices available to people and informs decisions about where to locate dwellings and businesses.
- The Brotherhood of St Laurence[63] suggests that allowing poor households to move to low emission alternatives, through improved urban planning and public transport, would be the most powerful measure to assist people on low incomes adapt to the introduction of emissions trading.

The Government's initiatives around Infrastructure Australia and what the Review understands to be national transport planning are certainly going in the right direction. However, issues of transport pricing (noted above) and the variety of imposts and subsidies need to be reviewed, and a decision made, as to whether they are well designed to reflect costs and advance the Government's other policy objectives in areas such as equity, regional development and industry development.

59 Australian Transport Commission, 2008
60 Citi, 2008, p 30-1
61 BTRE, 2002
62 Hughes 2008
63 Brotherhood of St Laurence, 2008

- Whatever governments choose to do about assisting groups, industries or regions, it should be explicit and transparent. From the point of view of the Review, the Government needs to bring to account the implicit cost of carbon in what it is doing. In cases like a dedicated freight track through Sydney, for example, there is likely to be a large dividend in avoided carbon emissions.

8.4.4. Fuel efficiency

There will also be scope to achieve emission reductions through improved use of motor vehicles and improving the fuel efficiency of the motor vehicle fleet over time. The most significant driver of these changes are likely to be consumer sentiments and preferences.

However, Government policies such as the procurement of motor vehicle fleets and import duties on motor vehicles may also be worthy of consideration in this area.

- Fleet purchases account for the bulk of cars in the second hand car market and as such, government fleet purchasing provides a potential mechanism to improve the fuel efficiency of motor vehicle transport in Australia.
- Insofar as the age of the vehicle fleet contributes to reduced fuel efficiency and higher emissions, measures to reduce the price of new and used vehicles may be worthy of further consideration. Such measures could include reducing the import duty (tariff) on motor vehicles[64].
- Existing information measures such as the Green Vehicle Guide and the Fuel Consumption Label which are designed to inform consumer behaviour can also facilitate change.

8.4.5. Other technology

It is not only the deployment of low emissions technologies in the energy sector (as discussed in Chapter 7) that will be important to reducing Australia's emissions. Continued innovation in areas such as information and communications technology (ICT) will also have an important, though perhaps less obvious, role to play in helping households and businesses to undertake everyday tasks in ways that generate fewer emissions. For example, ICT applications such as video conferencing may help to reduce the need for people to travel to work and to meetings. Other applications, like real-time freight management may also assist in reducing emissions from sectors such as transport (and in improving business productivity more generally).

8.5. Agriculture

Recommendation 8.4

In the lead up to the agriculture sector being covered by the ETS, the Commonwealth should, in cooperation with States and Territories:

- *develop and improve techniques for the measurement and analysis of greenhouse gas emissions; and*
- *undertake a stocktake of rural assistance measures that support greenhouse gas mitigation and adaptation (the National Review of Drought Policy may assist in this regard).*

64 BTRE, 2002, p68

Many of the Government's initiatives in the agriculture sector support climate change mitigation or adaptation. However, the effort directed at climate change is hidden within multiple programs, across a broad range of policy areas. Examples include:

- the focus on Murray-Darling Basin and water reform, and drought more generally;
- natural resource management programs, such as the $2.25 billion Caring for our Country, which has sustainable farming practices as one of its six investment priorities, through the continuation of Landcare; and
- substantial support for the RDCs which are increasingly focussing their efforts on climate change research for the agriculture sector.

In the 2008–09 Budget, the Government announced a further $130 million over four years in the Australia's Farming Future initiative to undertake research, to help farmers adapt, and to provide structural adjustment support for those leaving farming.

The initiative is still being developed. However, there is a risk that Australia's Farming Future will not fit with existing programs. In particular, it will be important to coordinate the research component, the Climate Change Research Program, with all the existing agricultural research, tools development and land management techniques undertaken in other related programs.

Similarly the Climate Change Adaptation Partnerships Program component intersects with water reforms and drought policy.

- The outcomes of the recently announced Drought Review primarily by the Productivity Commission will be directly relevant to this component.
- The Drought Review is to develop new policy to replace existing Exceptional Circumstances assistance (adjustment and safety net based programs), with future programs focused more on the impacts of climate change.
- Given the economic and social focus of the Drought Review, and the science and climate change focus of Australia's Farming Future, any potential policy gap between the two may need to be addressed.
- The Climate Change Adaptation Partnerships Program component of Australia's Farming Future should do this by taking on a strategic and coordination role.

In the meantime, a stocktake of existing work done in this area (of agricultural research, adaptation, sustainable farming responses) could be useful to address the current fragmented approach in the agricultural area and ensure more coherent policy development follows the Drought Review. This stocktake should also take account of what the States and Territories are doing.

Agriculture sector is a key area for complementary programs. It accounts for 16 per cent of Australia's emissions but, primarily due to emissions measurement limitations, the Government's Green Paper outlined a preferred position of not covering the sector until 2015, with a final decision on coverage to be taken in 2013. Until that time, agriculture will be the largest source of emissions outside of the ETS.

In the lead up to the inclusion of agriculture in the ETS, Government action should be limited to supporting the sector's transition to coverage. Three areas of action which the Review considers could be considered complementary to the ETS from this perspective are:

- Strengthening the identification and measurement of farm based emissions, and developing an approach to account for farm based emissions under the ETS.
  - These are technical matters for the Commonwealth Government to address, given its responsibility for measuring emissions and for developing the ETS. Given the challenges of trying to measure and account for emissions across more than 130,000 farms in Australia, consideration is being given to another point in the supply chain being responsible for accounting for farm based emissions.
  - New Zealand under their ETS, for example, will require meat processors be liable for livestock emissions. This will reduce the number of parties liable for emissions and simplify the management of the ETS.
  - Different options will need careful analysis as it is possible that the NZ approach may not encourage farmers to take action to reduce emissions, with the emissions costs placed on the meat processor and then passed on to the consumer. This approach would not appear to offer an incentive to farmers to cut emissions.
- Providing farmers with information and advice to help them understand their emissions, and what they can do to reduce emissions.
  - The major sources of farm based emission are: livestock (67 per cent), fertiliser use (19 per cent), allowed savannah burning (10 per cent) and manure management (4 per cent). Action in this area could include providing information about how to manage livestock to reduce the methane they produce, how to better use fertilisers to reduce soil emissions, and how to reduce ploughing so that soils retain more carbon.
  - This is an area that would benefit from joint action between the Commonwealth, States and Territories. Some approaches will be common across the country, for example managing livestock, while others will need strong regional approaches given, for example, different climate zones, soil types, and location.
- Providing farmers with information and advice on how they can adapt to the changing climate. Current programs that help farmers use climate data to better manage crop planting, for example, are good adaptation support.
  - In addition, investment will be required in the development of new technologies and farm practices, such as drought resistant crops, to improve the resilience of the farming sector.

The Commonwealth Government is already taking steps in this direction. The Government has already invested in an advanced National Carbon Accounting System for the land sectors (forests and agriculture) with the spatial detail that places Australia well technically for development of agricultural emissions measurement techniques that are optimal for designing coverage of agriculture in the ETS. Soil carbon measurement in agricultural lands is well advanced, and significant investment has been made in developing capacity for measurement of emissions associated with fertiliser use and manure management. The key next steps would be to develop techniques for livestock emissions suited to the ETS and for design of the overall system for practical use in the ETS.

8.6. Buildings

Recommendation 8.5

Governments should continue the development of a national building code that encompasses nationally consistent standards to improve energy efficiency of buildings, supplemented by rating tools. Building energy efficiency ratings should include disclosure at point of sale or commercial lease.

Studies such as the recent cost curve produced by McKinsey and Company (2007) indicate that the greatest return on energy efficiency (and hence abatement) can be achieved through improvements to buildings. This includes both improving the thermal efficiency of the building shell itself and improving the efficiency of associated equipment within the building (lighting, heating, ventilation and cooling (HVAC), motors).

Both the shell and associated equipment contribute significantly to commercial and residential energy use and emissions. In the commercial sector in 2005, HVAC accounted for 58 per cent of energy use and 52 per cent of emissions, while lighting accounted for 18 per cent of energy use and 23 per cent of emissions. In addition, buildings, as long-lived assets, may continue to have an effect on energy use for the next 50 to 100 years.

It is a similar situation in the housing sector. Any new measures, as they are likely to be limited to new houses or major renovations to existing houses, will only affect around 20 per cent of the housing stock over the next ten years. This leaves the problem of what to do with the remaining stock of housing that will not be captured by any new measures. Retrofitting these buildings to improve their energy efficiency would be a large, complex and expensive task and would require an extended period to complete.

Despite the estimated energy efficiency returns in the building sector, there is arguably underinvestment in energy efficiency, in part due to split incentives and other market failures (information asymmetries, externalities, organisational barriers).

Until now, the main Commonwealth Government interventions in the building sector have been regulatory. The building industry is a large and complex sector, suggesting that mandatory measures may be the more effective approach. Voluntary buy-in by the industry, however, can reduce the cost in ensuring compliance. As well, there is no market incentive for the builder or developer to improve thermal performance of a building, particularly if it adds to the construction cost. Most residential buildings are built to minimum standards only, suggesting that the occupier has little additional influence (or knowledge) in most cases.

- This could change if the disclosure of energy performance of a building at point of sale became more widespread and affected the price achieved. Evidence from the ACT suggests that disclosure has had an effect on the price of an otherwise equivalent house[65].
- Improving building thermal efficiency may have the perverse effect of increasing thermal comfort standards, rather than reducing energy consumption. In addition, the progressive reduction in energy consumption per unit of floor area is counteracted by a 39 per cent increase in average residential floor area between 1990 and 2010[66].

65 DEWHA and NFEE (2008), Modelling the Relationship of Energy Efficiency Attributes to House Price.
66 Australian Greenhouse Office 1999, p 9.

8.6.1. The Building Code of Australia

The primary regulatory measure is the Building Code of Australia, a mandatory technical standard for the design and construction of residential and commercial buildings. It was to be supplemented by national building energy and greenhouse ratings. The 2006 Code requires:

- Commercial buildings (including apartment blocks and hotels) to be built to 3.5-4 stars. Under the current Commonwealth Government policy, new leases over 2,000m^2 by agencies are expected to achieve a higher energy efficiency performance standard of 4.5 stars, including through a Green Lease where possible.
- Residential housing to be rated at 5 star for all new houses (out of 10 stars). When Queensland implements the rating on 1 January 2009, all States and Territories except Tasmania (4 star) and Northern Territory (3.5 star) will comply.
- Investa estimate the improvements in the Australian Building Greenhouse Rating can drive significant energy cost savings for a given area each year (from around \$20/m^2/year for a 1 star rated building to less than \$8.38/m^2/year for a 5 star rated building).

The National Australian Built Environment Rating System (NABERS) has been established to provide a measure of the environmental performance of buildings. It is a national initiative managed by the New South Wales (NSW) Department of Environment and Climate Change and overseen by the NABERS National Steering Committee, which is comprised of representatives of all Australian Governments. NABERS incorporates the earlier Australian Building Greenhouse Rating.

The Review endorses the national approach established by jurisdictions to develop a uniform approach across Australia to energy efficiency ratings, particularly for commercial buildings. This approach would be strengthened through the proposed NEEP.

The way forward should continue the improvements in energy efficiency in the building shell and its equipment, while acknowledging that the way energy is used inside the building is critical to harvesting the building's potential. The market is already starting to develop solutions to the address split incentives and capital constraints, and this can be expected to continue. In particular:

- a national building code that is a minimum standard should keep up with technology and community standards, supplemented by rating tools. Rating should include disclosure at point of sale and commercial lease;
- a carbon price, together with reform of Australia's electricity and gas markets, will assist in this area by increasing the incentives to invest in energy saving technologies; and
- the carbon market should also stimulate a larger demand and market for performance contracting. In the longer term, a market should develop, including energy service companies (ESCOs) and financial instruments, to reduce net present value issues and share costs and savings. There is also likely to be an increasing role for energy retailers as energy service providers.

Table 8.1: Parties to a Green Lease

Party	Role
Financier	Provides the upfront capital to fund structural changes and new appliances necessary to improve the building's energy efficiency
Energy service company	Guarantees the financier a revenue stream associated with the reduced costs of operating the building
Building owner	Contracts with the tenant to operate the building in a way that ensures the energy savings are realised and shares in the savings from reduced energy costs
Tenant	Agrees to operate the building in certain ways to ensure that the energy savings are realised and agrees to share the savings from reduced energy costs with the building owner and service company

8.6.2. Green Leases

Green Leases are designed to share the costs and benefits of energy efficiency improvements between the building owner and tenant. Green Leases modelled on the Commonwealth template (agreed in 2006) are now being adopted in other markets, including State governments, the private sector and internationally. Under a Green Lease, both the commercial building owner and the tenant agree to voluntary environmental objectives.

- There has been resistance to this approach from tenants, which should fall as more Green Leases enter the market. Energy has not been a negotiating priority for tenants, and they have been reluctant to commit to agreed measures with the landlord, perhaps due to a lack of understanding of the likely operational benefits that could accrue to them.
- However, once State and Territory governments develop a national Green Lease Schedule and implement it, Green Leases will apply to 26 per cent of Australian commercial office building market. This should accelerate the learning by doing in this area and hence the acceptance of Green Leases in the marketplace.

The current Green Lease is a contractually based, mutually beneficially arrangement between the building owner and tenant. However, there is scope for this model to be deployed more broadly to provide incentives for third parties to finance and undertake retrofitting – essentially a Green Lease requires the elements detailed in Table 8.1 above.

Models may also emerge where in place of the building owner, an energy retailer is able to aggregate a number of households and offer them more energy efficient appliances or retrofits of the houses in return for a share of what the household's reduced energy bills would otherwise be.

8.7. Environmental protection and planning

Recommendation 8.6

Environmental protection and planning laws across all jurisdictions should not require anything more than compliance with the ETS in respect of the emissions associated with projects in sectors covered by the scheme. However, such requirements may be appropriate in respect of uncovered sectors or where entities receive free permits under the scheme.

A majority of State and Commonwealth environmental protection and planning laws currently allow the relevant decision making to take a project's greenhouse emissions into account, among other things, in an assessment of its environmental impact and to set conditions around those emissions in approving a project. While such arrangements were appropriate in the absence of emissions trading, compliance with the ETS in respect of the project's emissions should be sufficient once the scheme is in place.

- Further, retaining the ability to set more onerous emissions targets in respect of particular projects could serve to undermine investor confidence – that is, businesses may be unwilling to invest if barriers beyond the need to acquit permits is imposed.

This logic applies for those sectors covered by the ETS. Where a project is in an uncovered sector it arguably does not face an effective emissions constraint and it would continue to be appropriate for environmental protection and planning laws to be able to consider a project's emissions as part of the decision making process.

A rationale may also exist for extending this exception to emissions intensive, trade exposed firms that receive free permits in respect of a large part of their emissions. That is, where firms are shielded from the full impact of the scheme, ensuring that their emissions continue to be scrutinised by environmental protection and planning authorities could be an effective means of ensuring they continue to be vigilant in looking for opportunities to reduce their emissions.

8.8. Conclusion

The Review aims through this chapter to have demonstrated some of the interconnections between the introduction of an ETS and the Government's policies in relation to a range of other markets. Reform in some markets and broader microeconomic reforms were good policies for the Government to pursue even in the absence of an ETS.

- What the introduction of the ETS does is effectively raise the stakes of getting these reforms right and ensuring they are progressed expeditiously.

The Government will also face some challenging policy choices in respect of whether to cover certain sectors where there practical difficulties associated with measuring emissions. Unfortunately, in none of these sectors will there be alternatives to emissions trading that are more environmental or cost effective. This why the Review considers that setting a clear timetable for the sector's inclusion in the scheme and measures to facilitate compliance with that timetable would be preferable to trying to impose alternative measures in the short term.

09

CHAPTER NINE:
SCIENCE AND ADAPTATION

Summary

This chapter examines the role for the Australian Government in the areas of climate change science and adaptation.

Climate change science is important to underpin decisions about mitigation and adaptation at both a domestic and an international level.

Policy decisions in an adaptation context need to consider the science, as well as information around the risk, probability and consequences of events related to the changing climate. Information from firms in the insurance and re-insurance markets should be part of this equation.

In the adaptation area, the role of risk analysis and the pricing of risk is not well understood or integrated into decision making. This is a critical gap in the current policy development approach across all jurisdictions.

To fill this gap, it is proposed that a panel be established to provide advice to COAG on adaptation priorities, cost-effective responses, and what role, if any, there is for government in helping businesses, communities and individuals respond to the impacts of climate change.

9.1. Introduction

Actions on science and adaptation are important elements of the response to climate change. The cost to the Australian economy as a result of ill informed decisions and poor contingency or adaptation planning could be significant.

- Scientific research provides the basis to understand what is happening and how soon it will happen, and it will also inform decisions on the ETS emission trajectory and targets.
- Adaptation action aims to assist communities deal with the unavoidable consequences of climate change.

Climate change science underpins each of the Government's three climate change policy priorities[67]. Adaptation to climate change we cannot avoid requires an understanding of the effect of current levels of greenhouse gases on the future climate. Consideration of future action requires a judgement based on scientific evidence as to the effect of expected climatic change on communities, infrastructure and ecosystems in Australia and overseas.

In deciding whether the benefits of action outweigh the costs, the community must consider whether to prepare for expected changes now based on the risk, probability and consequences of an expected event, or wait until the scope and extent of the consequences are clearer.

As set out in principle 2 of the Review's principles for complementary policies, the Review sees the primary role of governments in adaptation as ensuring that all sections of society are able to make informed choices about how to adjust their behaviour and decision making in response to the risk of unavoidable climate change.

67 Wong, 2008

Information will need to be credible and independent, and policy decisions should take account of the science, as well as information around the risk, probability and consequences of events related to the changing climate.

As the effect of unavoidable climate change will vary across different parts of Australia, the information and actions required in response will also vary across the nation. Principle 4 of the Review's principles for complementary policies emphasises that State and Territory governments are likely to have a leading role in adaptation actions.

This chapter explores these issues in more detail.

9.2. Climate change science

There is broad scientific consensus that human activity is affecting the climate, although there is uncertainty about the scope and pace of climate change (noting that, as with any area of science, this view is not without dissenters). Research to date suggests that climatic changes affecting our society and economy will increase over time.

In 2007, the IPCC concluded in its fourth assessment report that:[68]

- warming of the climate system is unequivocal;
- most of the increase in temperatures since the mid 20th century is likely to have been caused by humans;
- continued emissions at or above current rates would cause further warming and induce many changes in the global climate system in the 21st century that are likely to be larger than in the last century; and
- warming and sea level rise caused by humans would continue for centuries as it is built into the climate system, even if emissions are stabilised.

These changes have the potential to have a major impact on human and natural systems throughout the world including Australia.

9.2.1. The Australian context

Within the Review's principles for complementary policies, climate change science could be characterised in two ways:

- First, as a form of early stage research, there are likely to be significant positive spillovers from climate change science that justify public support. Put another way, activities such as measuring temperature changes over a long time do not necessarily have any immediate commercial application. This makes it unlikely that any company or individual will invest in such activities. From this perspective, climate change science could be viewed as a 'public good'[69];
- Second, the credibility of emissions trajectories set under the ETS (and hence their ability to drive investment) will depend, in part, on the perceived quality of the underpinning science.

68 IPCC, 2007
69 Productivity Commission, 2008

Together these arguments provide support for Australian Government investment in climate change science that is broadly consistent with principle 1 of the Review's principles for complementary policies. However, this commitment needs to be prioritised by Australia's interests, which reflect Australia's capabilities and geographic location.

Australian climate change research also contributes to global climate change science analysis undertaken within the IPCC. (The IPCC provides the information base for international climate change negotiations in the United Nations Framework Convention on Climate Change.) It is important that good scientific information on what is happening in our region feeds into local and global analysis of climate change trends. This supports progress toward a global climate change solution and informs the adaptation task facing Australia.

9.2.2. Existing program – the Australian Climate Change Science Program

The Australian Government supports science through both a dedicated program (the Australian Climate Change Science Program (ACCSP) and through the broader national research and innovation system: CSIRO, Bureau of Meteorology (BoM) and universities.

ACCSP was established in 1989, and has received funding of nearly $40 million between 2004-05 and 2008–09. ACCSP activities are consistent with the rationale outlined above – that is, research has focussed on climate change science in an Australian content. The ACCSP has also underpinned Australia's international research cooperation.

The ACCSP was reviewed in 2007 by two eminent international scientists: Dr Susan Solomon and Professor Will Steffen (the Solomon and Steffen Review)[70]. While the Solomon and Steffen Review was positive about the role of the ACCSP in meeting research needs to date, they considered that future research needs would not be met by a continuation of current approaches. They made four recommendations to tackle the challenges that lie ahead, namely:

- building an overarching national framework for strategic planning and efficient delivery of the climate change research effort;
- increasing the resource base, including human resources, science support, and supercomputer capacity;
- enhancing the cooperation between institutions and the flexibility needed to improve the effectiveness of the research; and
- global scientific engagement to ensure Australian climate research is well networked internationally in support of global scientific analysis, and consequent policy development.

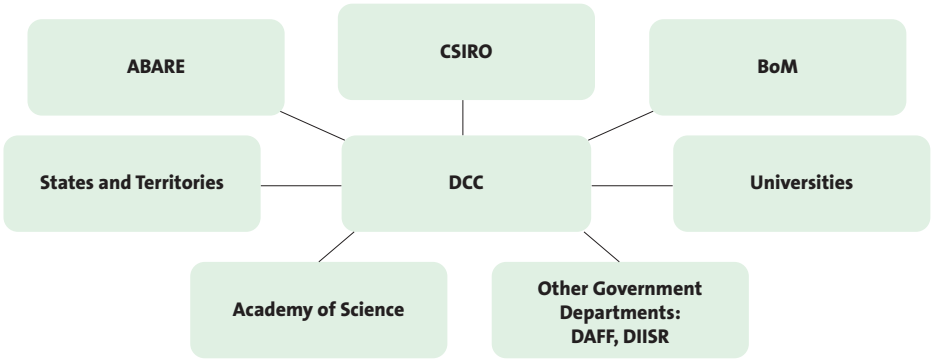
There will be an increasing demand in the future for good scientific research into climate change. In considering the work to date, the Review concluded that the ACCSP was complementary, particularly for the information it provides. Its objectives remain relevant and its activities should continue. In reaching this conclusion, however, the Review found that there was scope to improve performance management and reporting for the program.

70 Dr Solomon is Co-chair Working Group One of the Intergovernmental Panel on Climate Change and Senior Scientist, National Oceans Office, USA; Professor Steffen is Director, The Fenner School of Environment and Society, Australian National University. The Review is available at: http://www.greenhouse.gov.au/science/publications/pubs/cc-research.pdf

9.2.3. A national framework for climate change science

The Review considers that there is merit in building a coherent national framework for climate change science. This is a gap in the existing policy and program suite. As illustrated in Figure 9.1, there are many players in the science field. A national approach under DCC leadership would provide a means of ensuring that Australia's climate change research effort continues to provide sufficient information to underpin decision making about mitigation and adaptation at the domestic and international levels.

Figure 9.1: Interrelationships for development of national science framework



Chapter 3 discussed the Review's proposal for a National Climate Change Compact as a mechanism for agreement on respective roles and responsibilities between jurisdictions in relation to climate change. The Compact, if agreed, would provide a mechanism through which a national climate change science framework could be developed and agreed. However, in the absence of the Compact, it would be appropriate for the Commonwealth Government to develop the national framework through COAG.

The kind of framework envisaged by the Review would include the identification of climate change research priorities, such as effects on Australia's oceans, and a statement by COAG as to how these priorities will be tackled.

9.2.3.1. Climate Change Science Program

To help achieve future climate change science needs, the Review recommends that the existing Climate Change Science Program be broadened to be responsible for the development of a national framework for climate change science. The revised program would be responsible for improving Australia's understanding of the causes, nature, timing and consequences of climate change so that industry, community and government decisions can be better informed, and for developing a national framework for future action.

Recommendation 9.1

The Commonwealth Government should continue to support climate change science and should consider developing and implementing, through COAG, a comprehensive national climate change science agenda.

9.3. Adaptation

Adaptation policy aims to assist communities deal with the unavoidable consequences of climate change. The effects of climate change will be widespread and, in part, manifest through more extreme weather (higher temperatures, more heatwaves, more severe storms, changing rainfall patterns and more pronounced cycle of prolonged drought and heavy rains,[71] and rising sea levels. This will affect everyone's lives.

A range of actions will need to be taken to assist communities better manage the risk and consequences of the events, such as:

- developing drought resistant crops and improving the efficiency of water use;
- improving emergency response plans to cope with more severe or frequent events;
- changing building codes and designing and building houses that are better insulated and more wind resistant; and
- creating better planned buffers against bushfires, building sea walls and flood levees, and building more resilient infrastructure.

Two of the Review's principles for complementary policies are particularly relevant to adaptation:

- **principle 2** – The Government's role in adaptation is to facilitate informed decision making across the economy; and
- **principle 4** – The Commonwealth Government is primarily responsible for mitigation policy and all jurisdictions should contribute to a nationally coordinated approach to adaptation.

The Review considers that government action should be limited to ensuring that society is able to access information that helps everyone to understand how to factor the risks associated with climate change into a range of everyday decisions.

As the effects of unavoidable climate change will vary across different parts of Australia, the information and actions required will also vary across the nation.

Principle 4 emphasises that State and Territory governments are likely to have a leading role in adaptation actions, primarily through their planning laws and investments in public infrastructure.

- However, there will be some circumstances where Commonwealth Government leadership will be needed. The Murray-Darling rescue plan is one example of adaptation action where the complexity and magnitude of the issue across four States and the ACT means that there is a clear need for such leadership. The Commonwealth Government will also have a role in providing core information to underpin efficient and effective adaptation decision making nationally, and security of its assets, investments and infrastructure.

9.3.1. National Climate Change Adaptation Framework

The 2007 COAG National Climate Change Adaptation Framework (the Framework) (see Box 9.1) is the first step in the process of developing a coordinated national response to understanding the consequences of climate change.

71 Allen Consulting Group, 2005

The Framework provides the basis for government action on adaptation up to 2012, and includes possible early actions to build national adaptive capacity and to assist the most vulnerable sectors and regions. Reducing vulnerability is critical for water resources, biodiversity, coastal regions, agriculture, fisheries, forestry, health, tourism and settlements.

- A central objective of the Framework is to support decision-makers to understand and incorporate climate change into policy and operational decisions at all scales and across all vulnerable sectors.

Box 9.1: COAG National Climate Change Adaptation Framework

In April 2007, all jurisdictions endorsed the COAG National Climate Change Adaptation Framework. The Framework covers: adaptation science and research; regional climate change information and assessments; coastal regions; cross-cutting information and tools; and international collaboration.

The Framework focuses on reducing sectoral and regional vulnerability and building adaptive capacity for water resources, coastal regions, biodiversity, agriculture, fisheries and forestry, human health, tourism, settlements, infrastructure and planning, and natural disaster management. The Framework is in its early days of implementation, with sectoral specific plans under development.

The COAG Working Group on Climate Change and Water is developing a nationally cooperative approach to long term adaptation, including accelerating implementation of actions under the Framework.

- The COAG Working Group on Climate Change and Water is developing a nationally cooperative approach to long term adaptation, including accelerating implementation of actions under the Framework.

9.3.2. Existing programs and policies

The Government funds six adaptation programs which were considered by the Review. They cover research and planning in two broad areas:

- *National adaptation research and planning*: The Commonwealth Government is supporting implementation of priority research and other actions under the Framework, including funding for the Climate Change Adaptation Program and the CSIRO's Climate Adaptation Flagship.
  - The Framework includes possible actions to assist the most vulnerable sectors and regions to adapt to the effects of climate change.
  - The 2004-05 National Climate Change Adaptation Program delivered some important foundation work for adaptation framework.
- *Support for farmers*: Two new programs, Climate Change Adaptation Partnerships and the Climate Change Research program, have been introduced to support farmers adapt to climate change. Farmers will also have access to specific research and tools, such as those developed under the longstanding Managing Climate Variability program.
  - The Review notes that the development of these programs will need to consider the findings of the Drought Review.

In addition to these specific initiatives, Government initiatives related to drought and water could be considered adaptation programs.

The impact of rising sea levels on Australia's coasts is an area of particular interest, and one where State governments have a leading role to play. Coastal zone adaptation research and response planning is one of the priorities identified in the Framework. With approximately 85 per cent of Australia's population and associated infrastructure located in coastal areas, the effects of more frequent and severe storms could be significant.

The impact of rising sea levels will be widespread, affecting not only homes and transport infrastructure, but also Australia's export facilities, tourism sites, and fisheries. In June 2008, the Australian Government announced projects to map coastal urban areas, develop tools to allow for sea-based events to be included in planning codes and project how climate change affects offshore wave characteristics. These will provide an important basis for considered government action.

However, significant further investment will be needed to build on earlier studies or activities[72] to understand the effects of climate change on Australia's coasts and oceans, including effects of likely increased storm frequency and intensity, effects of warming oceans on coral systems, biodiversity and fisheries, and effects from land based run off. Box 9.2 below highlights the importance of ongoing research to fill gaps in our knowledge.

Adaptation will also be an important issue for Infrastructure Australia to consider in assessing Australia's future infrastructure needs, as it will be for health agencies across the country in planning for the effects of changing regional climates and corresponding expected changes in where certain diseases will be found (for example, increased incidence further south of mosquito-born disease).

Box 9.2: Sea warming and rising faster than thought

In 2008, a team of Australian and United States climate scientists reported their finding that the world's oceans warmed and rose at a rate 50 per cent faster in the last four decades of the 20th century than documented in the 2007 Intergovernmental Panel on Climate Change Report[73].

The study corrected biases in 40 years' worth of historical data that had led to conflict between observed and simulated changes. These biases arose because, until 2003, the most common technology used for ocean temperature measurement was designed to provide information for submarine communications and combat strategies, rather than data to document climate change.

The research accounted for biases in about 70 per cent of the ocean temperature data and gives significantly greater credibility to the way climate models simulate the degree of warming in the world's oceans – a key indicator of sea-level rise and climate change.

It also indicates an ongoing need for careful quality control of observational data and continuous monitoring of the oceans using diverse observations that can be checked against each other.

Source: Nature, June 2008

72 Including, for example, Vulnerability to Climate Change of Australia's Coastal Zone: Analysis of gaps in methods, data and system thresholds – 2006, International assessments of the vulnerability of the coastal zone to climate change including an Australian perspective – 2006, and Assessing and Mapping Australia's Coastal Vulnerability to Climate Change: Expert Technical Workshop – 2005.

73 IPCC, 2007

State, Territory and local governments are best placed to support adaptation responses in local and regional areas. For example, issues to be addressed in the regional specific plans under development in the Framework are likely to include: planning laws, building codes, contingency planning for health risks from the potential spread of diseases, plant and animal pest control, natural disaster management, and water resource management.

9.3.3. Future program design

In common with other areas of climate change policy, adaptation programs have evolved and expanded over time in an almost ad hoc fashion. Several programs have similar objectives and are undertaking similar activities. Adaptation is a priority for the Government and programs need to be realigned to recognise this and improve their focus, coherence and transparency. Adaptation programs would be complementary if they are reorganised under one overarching program with various subprograms targeting priority areas directly.

In reorganising activities, it would be appropriate for agencies to assess current performance management information to ensure that it is clear, has measurable performance indicators, and is aligned with other sub-program activities.

9.3.3.1. Climate Change Adaptation Program

To address these issues, the Review recommends that existing adaptation programs be consolidated in one program, called the Climate Change Adaptation Program. This program will provide:

- a more strategic approach to government activities;
- coordination between subprogram activities across and between agencies;
- clarity of reporting; and
- help with communicating what the Australian Government is doing on adaptation.

The Climate Change Adaptation Program will include the following sub programs:

- National Adaptation Framework Program – to support development of a national adaptation framework through COAG and provide resourcing for priority initiatives.
  - This may include support for the proposed National Adaptation Advisory Board.
- Agriculture Climate Change Program – to assist farmers to understand and manage the impacts of climate change, including improved seasonal forecasting and risk management.
  - This may include funding for RDCs.

Structural adjustment support for farmers to exit farming should be considered in the context of broader agricultural support, and will be subject to the outcomes of the Drought Review.

9.3.4. Facilitating adaptation decisions

Communities, businesses and governments need clear and credible information to make decisions on adaptation issues. Science is critical to provide a basis for assessment of the likelihood and risk of different climate change impacts and their potential costs.

The insurance and reinsurance industries can assist. Insurers will put a price on adaptation by setting an insurance premium needed to conduct a certain activity or to live in a certain place. For example, if a person plans to build a house in the tropics where the likelihood of violent storms is higher than in Brisbane, it would be likely that the insurance premium in the tropics would be higher than in Brisbane. However, if building and planning codes for construction in the tropics are more stringent and specifically aim to deal with hurricanes and high winds, that measure would have the effect of reducing the price of insurance.

Insurers or reinsurers map regions and activities together with the risks and the costs of those risks. This sort of information could be an important input to support governments, businesses and citizens decide what risks are important, and what measures or policies might be cost effective to reduce the risk.

Faced with a changing climate, individuals, businesses and communities will make decisions about what action to take in their particular circumstances – an exercise which is essentially one of managing risk. For example, the increased risk of drought involves a wide range of possible responses, including:

- investing in research and development to develop more resilient crops and improved predictions of weather patterns;
- building better financial buffers by saving or increasing prices;
- instituting market mechanisms, such as water trading, so that users of water pay the full social cost of the commodity; and
- taking the decision to close down and move.

A rational approach to identifying the sorts of actions that might be taken would involve consideration of the cost of the event occurring, the chance of it occurring and the cost of the adaptive action. If the cost of the adaptive action is much lower than the risk adjusted cost of the climate change event, then there is an incentive to adapt.

Managing the risk can involve transferring it. For example, many farmers take out insurance against crop failure resulting from adverse weather conditions. However, managing the risk requires tools and information designed for the end user and incorporated into planning and decision making processes.

The risk assessment and costing techniques employed by insurers and financial institutions provide a disciplined approach to assessing the costs and benefits of proposed policies or measures to adapt, or proposed actions by businesses, communities and individuals. However, these techniques are not widely used as a policy tool in government.

The Review considers that this represents a gap in the current approach by governments to adaptation. Without proper risk analysis and costing there is a danger that governments will embark on programs of adaptation that cost more than they save or are more expensive than they need to be.

The critical role of scientific research in the adaption policy framework is well understood, but the role of risk analysis and pricing of risk is not so well understood; nor is it integrated into decision making.

Over time, governments at all levels are likely to face increasing calls to intervene in response to the risks and impacts of climate change. It would be helpful for governments to have access to independent, expert advice to inform their responses to these claims.

The Review, therefore, proposes that COAG consider establishing a panel – the National Adaptation Advisory Board – of people skilled in science, public policy, and risk assessment (insurance and reinsurance) to advise on:

- priority issues for adaptation in Australia;
- what types of adaptive measures might be cost effective; and
- what role, if any, governments need to play in relation to adaptation.

Such a panel would enable COAG to avoid the temptation to approach risks in an ad hoc fashion. The panel could give COAG balanced advice on how the risks faced by different sections of the community or the economy should be prioritised and what sensible and cost-effective interventions might be possible. The panel would be able to advise governments on the challenges of climate change adaptation and suggest actions to respond to these challengers.

There may be other institutional arrangements that fit the COAG architecture for adaptation better than the creation of a panel. The critical thing from the Review's perspective is that the provision of risk analysis and costing of risks be integrated into decision making.

Recommendation 9.2

To ensure that there is sufficient risk analysis and costing of risks when considering adaptation action, the Commonwealth Government should work through COAG to establish a National Adaptation Advisory Board – to advise COAG on:

- *priorities for adaptation in Australia;*
- *what types of adaptive measures might be cost effective; and*
- *what role, if any, governments need to play in relation to adaptation.*

9.4. Conclusion

The critical role of scientific research is well understood in terms of government's adaptation policy framework. However, the role of risk analysis and the pricing of risk is not so well understood; nor is it integrated into decision making. This is a critical gap in the current policy development approach across all jurisdictions.

To fill this gap, the Review proposes that a panel be established to provide advice to COAG on adaptation priorities, cost-effective responses, and what role, if any, there is for government in helping businesses, communities and individuals respond to the challenges of adapting to climate change.

10

CHAPTER TEN:
INTERNATIONAL ISSUES

Summary

This chapter summarises the key challenges facing Australia in its pursuit of an international agreement on climate change mitigation, while concurrently pursuing comprehensive domestic action through the introduction of emissions trading.

Allowing markets to move resources to their highest value use across national boundaries will be the least cost way for the world to achieve sustainable emissions reductions. It is in Australia's national interest to lower its emissions using an efficiently functioning ETS as the main tool, even in the absence of an international agreement.

The Review has also considered where the experience of other countries may provide useful lessons for the Australian Government as it seeks to rationalise its existing programs in light of the ETS.

10.1. Introduction

Climate change is a global problem that requires a global solution. Just as domestic action on climate change is connected to a range of other policy areas, Australia's approach to an international agreement on emissions reductions cannot be developed in isolation.

Domestic action taken ahead of a solution that includes a majority of the world's major emitters is a second best outcome. However, as Professor Garnaut has explained, such an approach can be justified as part of the process of demonstrating Australia's willingness to play its part in a global solution. As a country exposed to the effects of climate change, Australia has a definite interest in the international community reaching an agreement that achieves meaningful emissions reductions.

Government action in the international context covers four priority areas:

- Negotiating a comprehensive international agreement to reduce global greenhouse emissions at least cost to replace the Kyoto Protocol, which ends in 2012;
- Facilitating international linking of mitigation measures, including the ETS;
- Capacity building and technology transfer, to support Australia's neighbours in the Asia-Pacific to undertake least cost emissions reductions, to adapt to unavoidable climate change and to actively participate in international negotiations; and
- Ensuring that climate change concerns do not lead to an increase in barriers to trade.

This chapter canvasses some of these issues in more detail.

10.2. Forging an international agreement

The main forum for negotiating a multilateral climate change agreement is the UNFCCC and its Kyoto Protocol. Apart from the broad objectives of the UNFCCC in setting a framework for international cooperation to address climate change, the Protocol has been the focus of action in the short term through its emissions reduction targets for the Annex 1 developed countries for 2008-2012. With the Kyoto Protocol commitment period ending in 2012, UNFCCC negotiations are now focused on what the global community needs to do to respond to climate change after 2012.

Having ratified the Kyoto Protocol in late 2007, Australia has formally committed to meet its Protocol target of 108 per cent of its 1990 emissions. Latest estimates are that Australia is on track to meet this target, largely as a result of measures to reduce land clearing[74].

There are several layers to the negotiations, and Australia's ratification of the Kyoto Protocol provides us with a seat at each of the key tables. In the climate change science discussions, Australian scientists have been active contributors to the analysis of the IPCC (see discussion in Chapter 8).

The Rudd Government's international climate change strategy articulated by the Minister for Climate Change and Water, Senator the Hon. Penny Wong, commits Australia to 'working towards a post-2012 agreement for addressing climate change that is equitable and effective, and that includes agreement on a long-term global goal for emissions reductions ... any post-2012 approach needs to secure widespread agreement of countries with diverse interests and entrenched positions.' More specifically, the Government has indicated that it will be seeking an international agreement in which:

- all major emitters commit to act, with differentiated commitments for developing countries;
- robust market mechanisms are used to drive cost-effective action;
- vulnerable countries are supported to act; and
- low emissions technologies are able to be developed and deployed widely.

A comprehensive agreement will contribute to achieving least cost emissions reductions. It is likely to take some time, however, to achieve such an agreement. In the absence of a binding global emissions constraint, it still makes sense for Australia to introduce an ETS. This is in part because the signalling effect will ensure that businesses and investors start to include a carbon price in their decision making, but also because it provides a tangible demonstration of Australia's commitment to reducing greenhouse gas emissions.

Accordingly, it is in Australia's national interest to continue to pursue domestic and bilateral action to reduce emissions in the short term, even in the absence of an international agreement, as a means to support the achievement of an effective global agreement in the long term.

10.2.1. Existing programs and policies

The Australian Government has four international programs that support:

- international negotiations; and
- capacity building in the Asia-Pacific region in adaptation, forestry and low emission technology.

These programs align with the Government's priorities and support Australia's national interest in pursuing a comprehensive international agreement and assisting our neighbours to take action to tackle climate change.

In addition to the negotiating process, Australia's support for other countries to reduce emissions or introduce low emissions technologies helps create a better environment for international negotiations. Australia's bilateral partnerships with China, the EU, Indonesia, NZ, South Africa, the UK and the USA

74 DCC, 2008

have provided opportunities to develop useful relationships in the international negotiating context and to undertake specific actions to reduce emissions. Programs such as the Asia Pacific Partnership on Clean Development and Climate (APP), and the International Forest Climate Initiative (IFCI) are providing avenues for the transfer of low emissions technologies to developing countries and help to preserve and expand their forests.

The new 2008–09 program, the International Adaptation to Climate Change Initiative, will provide practical assistance to developing countries in Southeast Asia and the Pacific. It will aim to: build capacity to analyse and understand climate change impacts; to assess risks and develop adaptation responses; and to identify and help finance adaptation responses. These types of programs also meet Australia's commitment under the UNFCCC to support developing countries in adapting to climate change.

As recommended in Chapter 2, while effective to date, there would be benefits in streamlining and consolidating the existing programs to ensure that over time they continue to be aligned with Australia's international negotiating strategy. Such an approach would also ensure that Australia has a clear strategy to manage initiatives that subsequently fail to deliver. In particular, the need to improve risk management was one of the Review's concerns with the Asia Pacific Partnership on Clean Development and Climate.

Beyond these bilateral partnerships, Australia has participated in the international dialogue on climate change. Funding provided to support these activities appears to have been effectively and efficiently used. Going forward, it will continue to be important that Australia's international negotiating efforts are appropriately resourced. Such activities should be seen as core business for DCC and funded as such.

There are also actions that Australia could take to increase the possibility of countries arriving at a post-2012 outcome.

For example, Australia could provide sufficient annual funding, in the order of $40 million, to the UNFCCC to enable it to conduct meetings that are otherwise not possible. The question with such funding is whether, in the context of how negotiations are progressing, such actions are likely to significantly improve the prospect of an agreement.

Other options include expanding bilateral partnership activities to include additional countries or broadening engagement with countries under existing partnerships. Such actions could be considered in the context of streamlining the existing program structure.

- With good project design and committed partners, bilateral activities can provide tangible outcomes and results that some countries may need to make them more amenable to a negotiated outcome.

Within the context of the framework of the Review's principles for complementary policies, actions which support the development of an international agreement on emissions reductions would be complementary within the context of principle 1. An important part of reducing Australia's emissions at least cost entails that the ETS is well designed as an effective response to the underlying problem of greenhouse gas emissions. A scheme that operates consistent with an international agreement is better targeted at that underlying problem.

10.2.1.1. Climate Change International Program

To address these issues, the Review is recommending that existing international programs be consolidated in one program, called the Climate Change International Program. This program would provide a framework for Australia's international activities. It would have at least four sub-programs:

- International Climate Partnerships – to strengthen Australia's bilateral climate change partnerships and meet international convention commitments;
- International Adaptation to Climate Change Initiative – to assist neighbouring developing countries in South East Asia, the Pacific islands and East Timor, adapt to climate change;
- International Forest Carbon Initiative – to demonstrate that reducing emissions from deforestation and forest degradation can be part of an equitable and effective international agreement on climate change under the UNFCCC; and
- Asia-Pacific Partnership on Clean Development and Climate – to develop, deploy and transfer cleaner, more efficient technologies between partner countries.

Recommendation 10.1

The Government must have strong and effective international engagement, which is appropriately resourced, to influence and support international least cost abatement of greenhouse gas emissions.

10.3. Access to international abatement opportunities

Australian action to reduce emissions in other countries can be equally as effective as domestic action, and a deep and liquid international emissions trading market will be in Australia's interests.

A critical design issue for the ETS is the ability for domestic firms to access abatement opportunities outside Australia. This could be pursued in the longer term by linking the ETS to other national schemes.

- Potentially, the biggest arbitrage in the carbon market is the possible trade between developing and developed economies. Putting aside the vagaries of sovereign risk, there are mitigation and reduction possibilities in developing economies that are much cheaper than in developed nations.
- For these to be readily accessed, ETS design and international policy relating to aid and cooperation and influence over an international carbon agreement, should seek to overcome barriers and impediments to that trade or arbitrage occurring. This would allow low cost mitigation options in developing countries to be taken up. It may well be that the lowest cost to the Australian economy and the world economy will come from buying emission reductions outside Australia.
  - Deep and open international markets for carbon are the ultimate end point being sought by international agreements and national schemes, such as Australia's.
- In the short term, however, these benefits will need to be tempered with the need to ensure that overseas abatement opportunities are credible and do not introduce complexity into the scheme. Overseas abatement will need to meet similar standards of measurement and assurance as domestic abatement opportunities.

Box 10.1 below illustrates the potential for significant abatement opportunities in other countries.

Box 10.1: Supporting reforestation in Kalimantan

The $30 million Kalimantan Forests and Climate Partnership under IFCI is the largest demonstration project of its kind in the world. This joint Indonesian-Australian project aims to preserve up to 70,000 hectares of peat land forests in Indonesia's central Kalimantan region, re-flood up to 200,000 hectares of dried peat land and plant up to 100 million new trees on rehabilitated peat land for conservation purposes. It has the potential to reduce greenhouse gases by a greater amount than Australia's current total annual emissions.

Given that there will be uncertainty around international actions and commitments, it will be important that arrangements for setting short term emissions caps and longer term trajectories are sufficiently flexible to allow the Government to be credible in the context of international negotiations about its ability to take on new targets.

10.3.1. Trade policy

Just as domestic action on climate change is connected to a range of other policy areas, Australia's approach to an international agreement on emissions reductions cannot be progressed in isolation.

Trade policy has an important role to play in providing solutions to climate change, although it is only one of the policy tools available. For example, reducing tariffs and non-tariff barriers to free up trade in low emissions technologies and products will make an important contribution to an efficient international mitigation effort.

World Trade Organisation rules allow its members to pursue legitimate environmental concerns in a way that promotes trade and sustainable development and avoids trade restrictions and distortions. Australia should continue to support international action on climate change that is consistent with open trade policies.

The Trade Minister, the Hon. Simon Crean MP, has outlined the main policy drivers underpinning the Government's approach to the interrelationship between trade and climate change policies:

- The global climate and trading regimes must support each other. Any measures to tackle climate change must support the rules-based system of open trade that underpins the global economy;
- The WTO rules permit Members to take measures to respond to climate change. Australia is pushing for an ambitious outcome from the WTO Doha round of trade negotiations to further liberalise trade in environmental goods and services;
- Punitive trade measures being used to respond to competitive concerns arising from climate change action are not consistent with open trade, would damage the global trading system and make it more difficult to build consensus for a post-2012 global climate change regime; and
- A global response to climate change offers significant economic, trade and employment opportunities through liberalised trade access in environmental goods, including technology and services. Australia has an opportunity to capitalise on growing markets for zero and low emissions products and technologies.

Australia should resist suggestions coming from Europe and the United States to unilaterally impose a cost of carbon on imports where they are competing with domestic products that have carbon included in their pricing. Such approaches may gain momentum in the event that an international solution remains elusive.

- While such an approach would not necessarily restrict Australian imports given Australia's ETS, it risks undermining the international trading system without necessarily encouraging progress towards an international agreement on emissions reductions.

Australia should also continue to resist simplistic approaches purporting to promote low carbon products, such as the food miles idea, which can unfairly target products that are transported further than locally produced products. While the food miles concept proposes the carbon cost of transport be identified on product labels, the carbon associated with transport is unlikely to account for the full carbon cost of the product. Locally produced products could include significant carbon inputs in their production cycle. A more accurate approach would involve a full lifecycle analysis for products, which is likely to be a costly exercise.

10.4. Lessons from other countries' approaches

The Review has also considered whether the climate change policy responses of other countries offer any useful lessons for Australia, particularly in the context of designing measures to complement an emissions trading scheme or carbon tax.

- Australia's approach is quite unique – as yet there does not appear to be any other country that has committed to a comprehensive emissions trading scheme and considered how its existing policy suite should be changed in light of that scheme. Australia is leading the world in this aspect of its approach to climate change policy.

Many countries have in place a variety of policies and programs to respond to climate change. Some approaches are more comprehensive than others and there are many common features. These include similar approaches to Australia and other countries on energy efficiency, building and appliance standards, support for low emissions technologies, support for PV panels, new transport fuels, product labelling (including vehicles), waste management strategies and government procurement policies.

A number of countries have in place or are developing emissions trading systems. The EU has had an ETS in place since January 2005, and NZ's ETS legislation was debated in Parliament in June 2008 for expected implementation in 2009. Several EU countries have considered schemes for tradeable energy efficiency certificates providing credit for energy not used. These approaches have provided useful information and lessons for the development of the Australian ETS.

Underpinning the different approaches have been different philosophies regarding the value of market based instruments and the use of regulation. This is important when considering the success or otherwise of different initiatives.

An emissions trading scheme sets a high benchmark in terms of being an economically efficient instrument. Measures to reduce emissions adopted in other countries have generally operated in the absence of a comprehensive ETS, and have tended to be more expensive.

- For example, Germany has in place a feed-in-tariff that has led to the installation of many PV panels and has provided significant industry support. However, it has come at a high cost – the tariff is 40 euro cents per kWh above the average cost of electricity between 4–6 eurocents per kWh. Between 2000 and 2012 the excess cost of promoting PV systems is estimated by the IEA as between EUR 30 to 36 billion[75].
- California appears to have had some success with energy efficiency targets, especially in reducing the need for extra investment in power plants. It has also tended to rely on a regulated target approach, rather than market mechanisms.

However, the UK Carbon Trust appears to have been successful in developing innovative approaches to help UK households and businesses to more quickly adopt measures to reduce their emissions. Of particular interest is the venture capital arm of the Trust, which has been supporting the development of commercial low carbon technologies. The model provided by the Trust and its application in Australia was discussed in Chapter 5.

The UK is also developing specific legislation which sets emission reduction targets of 26–32 per cent by 2020 (against a 1990 baseline) and 60 per cent by 2050. The Climate Change Bill is expected to pass Parliament in 2008. It also provides a stronger framework for the government to achieve the Bill's targets and requires regular accountability to the UK Parliament and devolved legislatures – including the establishment of an independent Committee on Climate Change to provide expert advice on specific targets and policy options.

A more comprehensive discussion of action being taken internationally is provided at Attachment 10.A.

10.5. Conclusion

Climate change is a global issue and requires a global solution. Harnessing the ingenuity of markets, both local and international, to move resources to their highest value use across boundaries will be the least cost way for the world to achieve sustainable emissions reductions. It is in Australia's national interest to lower its emissions using a fully functioning ETS as the main tool, even in the absence of an international agreement.

Australia's experience with designing and implementing an ETS will be invaluable in persuading other countries to do likewise, and to trust in market based instruments.

International technology cooperation will be an important aspect in reducing the cost of both mitigation and adaptation, and may accelerate the development of new technologies. Australia can assist developing countries to reduce their emissions through technical assistance and technology transfer, as well as help support new markets such as carbon offsets. Deep and open international markets and international ETS linkages will improve the efficiency of an Australian ETS, including through access to low cost mitigation in locations outside Australia.

With the Kyoto Protocol ending in 2012, there is little time available for the international community to agree on the next phase of global climate change action. No agreement, or one that is not inclusive, will have major implications for the approach Australia might take to reduce emissions from 2012. It is in Australia's interests to engage actively in the international arena given the risks associated with an ineffective international outcome.

75 IEA, 2007.

Attachment 10.A: Climate change approaches of other countries

This attachment briefly summarises significant climate change initiatives in other countries.

European Union

The bulk of European Union (EU) emissions (approximately 59 per cent) come from the energy sector, followed by transport (21 per cent), agriculture (9 per cent), industrial processes (8 per cent) and waste (3 per cent). The EU has one Kyoto target, with differentiated responsibilities across its member countries, and is generally on track to meet its combined target. The EU has undertaken to cut its greenhouse gas emissions by 20 per cent of 1990 levels by 2020. It will increase the target to 30 per cent if other countries agree to a similar commitment.

The cornerstone of the EU response to climate change is its emissions trading scheme, introduced on 1 January 2005. It presently covers about 40 per cent of EU emissions, applying to over 10,000 facilities in the energy and industrial sectors. Discussions are underway to broaden its coverage to include industries and greenhouse gases for the scheme's third trading period from 2013 to 2020.

In addition to the ETS, in March 2007 the EU introduced a range of new climate change and energy security measures, including programs in support of renewable energy technologies, energy efficiency measures, constructing ten to twelve large-scale carbon capture and storage demonstration plants by 2015, and energy sector reform. The EU has a renewable energy target of 20 per cent by 2020, and biofuels are to make up ten per cent of EU petrol and diesel consumption for transport by 2020.

Germany has provided significant support for the development and deployment of renewable energy technologies, which has helped keep Germany on track for its Kyoto target of a 21 per cent reduction of its 1990 emissions. Renewables account for 5.8 per cent of its primary energy supply, exceeding the EU target of 4.2 per cent by 2010. It is on track to achieve its renewable energy target of 12.5 per cent by 2010. However, support for PV panels is with a feed-in-tariff of about 40 euro cents per kWh above the average cost of electricity (of 4-6 eurocents per kWh) from conventional power plants (nuclear, coal or gas). While it has boosted the uptake of PV panels, it has come at considerable cost. Between 2000 and 2012, the excess cost of promoting renewable electricity in Germany is estimated to be EUR 30 to 36 billion. Carbon abated by this policy costs around EUR 1000 per tonne of CO2 (where it replaces gas), or about EUR 350-400 for coal. The IEA has recommended that Germany evaluate the cost effectiveness of this approach and move to a market-based means of promoting renewable energy.

Emissions from the UK are close to the EU averages, with 64 per cent from energy, 20 per cent from transport, 7 per cent from agriculture, and 4 per cent from industry.

The UK approach to climate change is focused on carbon pricing, technology policy, and removing the barriers to behavioural change. The UK is part of the EU ETS, and also taxes and regulates the cost of carbon. It is supporting the development of low emission technologies through support for research, development and deployment. It is removing legal barriers to CCS and planning barriers for energy technologies. The UK is also supporting the uptake of energy efficiency actions by households and businesses by providing information, and implementing measures to cut public sector emissions.

Of particular interest is the establishment by the UK of a private sector company to use private sector approaches and innovation to help UK businesses and households reduce emissions reductions. The Carbon Trust was established in 2001 with an emissions reduction mandate, and it estimates that

between 2001 and 2007 it abated 10.8 MtCO2. The Trust's operations include a venture capital arm to support low emissions technologies, developing and marketing low carbon products, energy efficiency strategies and interest free loans for businesses, and information for households.

The Energy Saving Trust (EST), also a non-profit organisation jointly funded by the UK government and the private sector, complements the Carbon Trust as it focuses on households in promoting the sustainable use of energy, energy conservation, and CO2 emissions. The EST was established in 1993, following the 1992 Earth Summit, and it is implementing phase 1 of the government's Low Carbon Building Program and provides free advice on energy efficiency options.

The UK Climate Change Bill is expected to pass Parliament in mid 2008, and it sets emission reduction targets of 26-32 per cent by 2020 (against a 1990 baseline) and 60 per cent by 2050. It provides a stronger framework for the government to achieve the Bill's targets and requires regular accountability to the UK Parliament and devolved legislatures.

United States

The United States (US), the world's largest emitter of greenhouse gases in 2006, negotiated a 93 per cent Kyoto target but then decided not to ratify the Protocol. Instead, the US aims to reduce the greenhouse gas intensity of its GDP by 18 per cent over the 2002-2012 period, which represents around a 20 per cent increase in total emissions from 1990. The US response to climate change includes mandatory, incentive-based and voluntary measures, with a focus on technology research, development and deployment, covering wind, solar, CCS and clean coal, biofuels (mandated to be 15 per cent of fuel supply by 2022), hydrogen, nuclear and fusion. It has also mandated a national fuel economy standard of 35 miles per gallon to be achieved by 2020, has set 45 new appliance energy efficiency standards, and requires a 30 per cent energy efficiency improvement in federal government operations and 20 per cent renewable fuel use by 2015.

The US also has in place programs to help businesses and economic sectors improve energy efficiency and reduce emissions, including one that focuses on actions and reporting by very large companies. The Energy Star program provides information on cost-effective energy efficient products across the residential, commercial and industrial sectors. There are other programs to achieve efficiencies in the transport and aviation sectors through more efficient business practices. There are measures to encourage farmers to sequester carbon, and to support biofuels and the use of renewable energy, to offset demand for other forms of carbon intensive energy. Tax incentives are also provided to encourage investment in clean technologies.

In 2007 the US increased international engagement in APEC and the G8 climate discussions, and it launched the Major Economies Meetings on Energy Security and Climate Change. However, the US remains opposed to any mandatory emissions targets, instead supporting a long-term aspirational global goal based on national aspirational commitments. The US has in place 14 bilateral partnerships and takes part in a number of international forums focused on developing clean technologies for example APP, and Methane to Markets.

The US agreed to the Bali Action Plan under intense pressure, and 'clarified' its understanding of the plan after the conference. The US stated that negotiations must take into account that climate change cannot be addressed by emissions cuts in developed countries alone, and that the responsibilities of developing countries should be differentiated based on their economies, emissions and energy use.

The US has several emissions trading type schemes in operation, including the 1990 cap and trade system established to address acid rain by reducing SO_2 emissions. The main initiatives are the 2003 Chicago Climate Exchange providing for voluntary trade in CO2 emission allowances, and the Western Climate Initiative, which is made up of eight partner US and Canadian states and provinces (Arizona, California, New Mexico, Oregon, Washington, Utah and Canadian provinces of British Columbia and Manitoba), with approximately 18 other US, Canadian and Mexican states and provinces as observers. In August 2007 Initiative partners set an overall regional emissions reduction goal of 15 per cent from 2005 levels by 2020. By August 2008 the Partners are expected to complete the design of a market-based mechanism to help achieve that goal.

California's emissions predominately come from the transport sector (38 per cent), energy (25 per cent), industrial (20 per cent) agriculture and residential (both 6 per cent), and 3 per cent commercial. In 2005 California announced its greenhouse gas reduction target of 1990 emissions levels by 2020. The target was set into law with the adoption of the *California Global Warming Solutions Act of 2006*. A longer term target of 80 per cent below 1990 emission levels by 2050 was set by the Governor.

The Act includes regulatory and market mechanisms to achieve quantifiable reductions of greenhouse gases. It focuses on the transport sector, California's largest source of emissions. It includes a requirement for a 10 per cent reduction in the carbon intensity of passenger vehicle fuels by 2020. Additional reduction targets have yet to be set. It includes mandatory reporting for the 800 largest sources of stationary greenhouse gas emissions. A planning process is underway to develop strategies to secure emissions from 10 other sectors, including agriculture, cement, energy, forestry, land use, water and state vehicle fleet. The strategies on how to reduce emissions from these sectors are to be developed and adopted by 2009. A further program (under other legislation) provides grants for alternative and renewable fuels and vehicle technologies. These funds are also available to support renewable fuel infrastructure, fuelling stations, development of vehicles and related technical training programs.

Electricity accounts for 28 per cent of California's emissions and the Act sets a target of 20 per cent of electricity production from renewable sources by 2010 and 33 per cent by 2020. To achieve this, planning and permitting processes will be streamlined, the transmission grid and distribution system will be expanded and upgraded and there will be an expanded use of FITs. Renewables currently supply 11 per cent of electricity generation. Further to the Act, emissions reduction guidelines are being developed for the electricity and natural gas sectors, and energy efficiency standards for appliances and buildings are being strengthened. Approximately 32 state agencies have or are developing agency responses to climate change. Energy efficiency appears to have been a successful tool, with electricity use per person remaining reasonably constant for 30 years. The main areas of action have been in improving building codes, appliance standards, and utility energy efficiency programs. A reward/penalty system is in place to encourage utilities to meet or exceed energy efficiency goals.

The Act also allows for the creation of offsets from a range of projects, including manure management, forestry, building energy, SF6, and landfill gas capture. These are expected to be available for trading through the Western Climate Initiative.

Canada

Canada's emissions are predominately from the energy sector (56 per cent), followed by transport (35 per cent) with agriculture and industry 7 per cent each. Based on 2005 emissions figures, Canada is significantly overshooting its Kyoto target of 94 per cent of its 1990 emissions with its emissions 25 per cent above 1990 levels. Canada has set a long term domestic target of reducing emissions by 60 to 70 per cent of 2006 levels by 2050, and 20 per cent by 2020. To meet these targets, Canada is developing an emissions trading system that will include access to domestic and external offsets, and possible linkages to the US emissions trading schemes. It is also funding the development and deployment of low emissions technologies, including CCS, and supporting biofuels.

In 2007 the government released a new action plan on addressing air pollution and greenhouse emissions. The plan includes mandatory targets on industry for an absolute reduction of 150 mega tonnes in greenhouse gas emissions by 2020; a requirement that industry cut air pollution by 50 per cent by 2015; regulating the fuel efficiency of new cars and light duty trucks from 2011; and strengthening energy efficiency standards for a number of products, including light bulbs. It is also providing information to support households and businesses, and offers incentives for use of public transport, information on energy efficient vehicles and rebates for purchasing energy efficient vehicles, support for retrofitting homes, buildings and industry, and tax credits rebates.

New Zealand

The agriculture sector is the largest source of NZ's emissions (48.5 per cent), closely followed by the energy sector (43.4 per cent), then industrial processes (5.6 per cent), waste (2.4 per cent) and solvents. Total emissions have increased 24.7 per cent (15.3 Mt CO2-e) over the 1990 levels, which is significantly above its Kyoto target of 100 per cent of 1990 emissions. In February 2007, the government set a target of 2020 to be the first country to be carbon neutral, with zero net carbon emissions across all sectors.

The key NZ policy response is its emissions trading scheme, with obligations commencing in 2008. The ETS will initially cover the forestry sector, and progressively other sectors (liquid fossil fuels in 2009, stationary energy and industrial processes in 2010, and agriculture and waste in 2013. In relation to other policies, NZ has set a target for renewable energy generation of 90 per cent by 2025. The government is also supporting the development of renewable energy generation, efficient transmission, sustainable transport and biofuels, energy efficiency and new technologies. In promoting improved energy efficiency for homes, it is providing interest free loans for audits and retrofits, covering insulation, solar hot water systems, and replacement of inefficient fridges over 20 years.

In relation to transport, NZ has a target of halving per capita transport emissions by 2040, by improving fuel economy by 25 per cent by 2015, promoting the uptake of electric vehicles, reducing single occupancy of vehicles, and promoting public transport and the use of biofuels.

China

The energy sector is the largest source of China's emissions (60 per cent) followed by agriculture (20 per cent), industry (8 per cent), transport (4 per cent) and other sources (7 per cent). Between 1990 and 2002, China's emissions grew approximately 50 per cent. From 2003-2004 alone, emissions are estimated to have grown a further 35 per cent, representing about half of the total global increase global increase in that period.

China's emissions reflect the rapid expansion of its economy and electricity generation capacity. Primary energy demand is projected to more than double from 2005 to 2030. To match demand, China needs to add more than 1 300 GW to its electricity generating capacity, more than the total current installed capacity in the United States[76].

China announced its National Climate Change Program (NCCP) in June 2007. The main objectives of the NCCP are to control emissions, improve energy efficiency and building construction, develop the renewable and nuclear energy sectors (setting a renewable energy target of 16 per cent by 2020), enhance electricity transmission and distribution and grid safety technologies, increase forest cover, improve industrial policy, bolster R&D for industry and agriculture, enhance adaptation capacity, and raise public awareness. There is high level political support for the NCCP, with domestic climate change policy being overseen by the Premier. In addition, the 2005 Five-year Plan focuses on reducing energy intensity (that is, the per cent of energy/unit of GDP), with the target of a 20 per cent reduction by 2010.

China's energy production is dominated by coal, with 69 per cent being generated from coal in 2005. China is likely to face several challenges in its carbon intensity per unit of energy: its ability to adjust the energy mix is, to an extent, constrained by the available mix of energy resources; its ability to improve energy efficiency will be subject to the availability of advanced technologies and financial resources, and its coal-dominated energy resources and consumption structure is unlikely to change substantially in the near-term.

The government has in place a range of energy efficiency policies, covering industrial processes, as well as for buildings, machinery, and the government sector. The government introduced mandatory fuel efficiency standards in 2005. China's Top 1000 Industrial Energy Conservation Program aims to reduce the energy consumption of its 1000 largest industrial consumers by voluntary agreement. In 2004, this group accounted for 47 per cent of the total energy consumption of Chinese industry.

India

India's emissions are also dominated by the energy sector (52 per cent) followed by agriculture (34 per cent), transport (5 per cent) industry (4 per cent) and other processes (6 per cent). India's rapid economic development of approximately 8-9 per cent annually in recent years is contributing to its increase in greenhouse gas emissions.

In June 2008, India announced it National Action Plan on Climate Change. The Plan includes core 'national missions' for implementation through to 2017 in the following areas.

- solar energy: goals include increasing production of PV to 1000 MW/year, and deploying at least 1000 MW of solar thermal power generation;
- energy efficiency: Mandating energy consumption decreases in large energy-consuming industries, trade energy-savings certificates; reduced taxes on energy-efficient appliances; and financing for public-private partnerships to reduce energy consumption in government buildings;
- sustainable habitat: improve building code, waste management, vehicle fuel economy standards, incentives to encourage use of public transport;

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- water management: 20 per cent increase in water use efficiency through pricing and other measures;
- sustainable ecosystems and agriculture: in particular for the important Himalayan region, as well as afforestation of 6 million hectares, increasing forest cover from 23 per cent to 33 per cent of India's territory, development of climate-resilient crops, expansion of weather insurance mechanisms, and improvement of agricultural practices; and
- strengthen knowledge of climate change: establish a Climate Science Research Fund, improve climate modelling, and increase international collaboration, encourage private sector initiatives to develop adaptation and mitigation technologies through venture capital funds.

The Plan supports ongoing activities including, the retiring inefficient coal-fired power plants and supporting research on related new technologies; central and the state electricity regulatory commissions must purchase a certain percentage of grid-based power from renewable sources; large energy-consuming industries are required to undertake energy audits and an energy labeling program for appliances has been introduced.

India also has targets of 10 per cent of annual additions to power to come from renewables, 15 per cent of total electricity production to be from renewables by 2032 and 10 per cent of oil replaced by biofuels also by 2032.

11

CHAPTER ELEVEN:
TRANSITION AND FUTURE DIRECTIONS

Summary

This chapter summarises the Review's thinking and recommendations about the scope for policies and programs to complement an ETS – it draws together the analysis contained in previous chapters and maps out where the Review would suggest that the Government's climate change policy head in the future.

11.1. Introduction

Global warming represents a diabolical problem for governments. Decisions must be made under profound uncertainty about an issue with global scope and a time scale measured in decades and centuries. However, the stock of knowledge about climate change is increasing and with it awareness about what can be done.

An effective response to climate change means changing decision making – by consumers and business, across States and Territories, regions and eventually, it is hoped, the world. To date, decisions about what and how much we should produce and consume have not factored in the expected impact of carbon emissions on the environment. In simple terms, what an ETS does is price these impacts so that they can be considered as an explicit cost in decision making.

Policies and programs which complement the ETS will support the ability of the price signal set by scheme to flow through to the decisions of consumers and businesses and their ability to make rational changes to what they decide to consume and produce (both now and in the future) in response to that price signal.

11.2. Understanding decision making

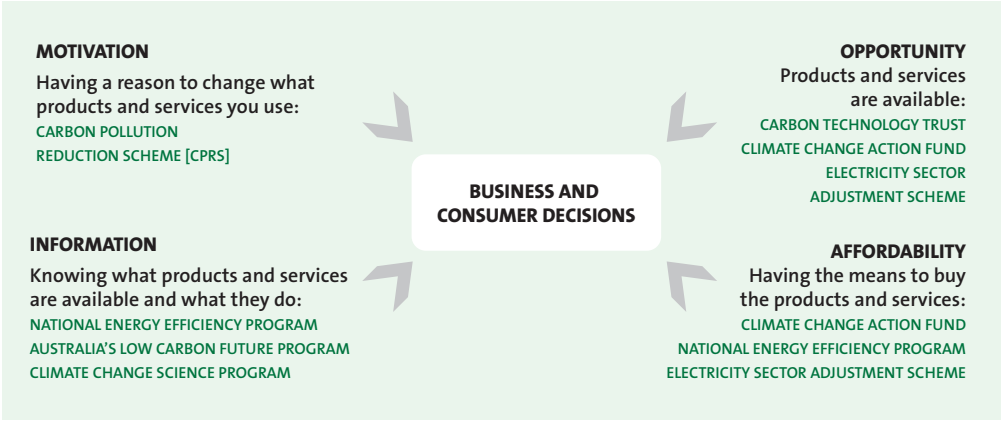
Changes to decision making essentially require four conditions to be satisfied, which in a climate change context we can refer back to the ETS and the role for complementary policies and programs.

- First, agents require **motivation** – that is, a reason to change what products and services they produce and consume. As noted above, this is what the ETS is designed to do but it is important to understand that its ability to do so rests on the credibility of scheme.
  - The carbon price will reflect not just the cost of reducing emissions today but expectations about how hard it will be to achieve emissions reductions in the future and how large those future reductions will need to be. Both the Government's approach to the design of the scheme and its approach to policies and programs in addition to the scheme will be important factors in shaping these expectations.
- Further, agents need the **opportunity** to change which requires alternative products and services to be available for consumption or able to be produced.
  - Opportunities for change will be determined in large part by technological change – as noted in Chapter 6, the positive spillovers associated with investments in research and development into new technologies may provide a basis for the Government to intervene in addition to the ETS.

- The availability of alternatives is not necessarily sufficient to change decision making; agents need to know that alternatives exist and have access to **information** and tools which enable them to differentiate between those alternatives.
  - A key feature of the future program suite recommended by the Review is that the Government's role over time will move increasingly to being one of collecting and disseminating information.
- Finally, change needs to be **affordable**. If agents do not have the means to purchase alternative products and services then – regardless of whether they know about them and can chose between them – they effectively have no capacity to change.
  - This does not mean that the Government should intervene to make all alternatives affordable for all consumers and businesses. Rather, the introduction of a carbon price and the broader settings in the tax and transfer payments systems should not undermine the ability of consumers and businesses to change.

Figure 11.1 brings together these conditions for decision making and how they relate to the Review's recommended future policy suite.

Figure 11.1: Conditions for decision making



11.3. Complementary policies and programs

11.3.1. Having a framework is important

The most 'complementary' policy which the Government could adopt is a framework for designing complementary policies.

- A framework is important for a number of reasons. It imposes a discipline on the scope for policies and programs in addition to an ETS which will help to buttress the scheme's credibility. Investors will be just as concerned with what the Government signals it will do in addition to the scheme as they will with scheme design features.
- One of the key problems with previous approaches to climate change policy, and the cause of much of the proliferation of programs, was the absence of a framework.

Policies in addition to the ETS should be concerned with either improving the efficiency of the market or with other policy priorities, such as equity, in a way that does not undermine the efficiency of carbon market. The carbon price – both in the market and implicit in additional policies – will be an important metric in this context.

The Review's principles for complementary policies have been developed to provide the Government with a framework that addresses these points (see Box 11.1 below).

Box 11.1: Principles for complementary policies

- **Principle 1**: (mitigation) The Government should rely on the ETS to achieve least cost abatement and only take action in addition to the scheme where there is a demonstrable and compelling case that the market is not working efficiently and that government action will not distort or undermine the scheme.
- **Principle 2**: (adaptation) The Government's key role in adaptation should be to facilitate informed decision making across the economy.
- **Principle 3**: (other policy priorities) The Government should take into account the potential for its non-climate change policies to compromise or enhance the ability of the ETS to achieve least cost abatement.
- **Principle 4**: (roles and responsibilities) The Commonwealth should be primarily responsible for mitigation policy and all jurisdictions should contribute to a nationally coordinated approach to adaptation.
- **Principle 5**: (good policy design) As in all areas of policy, climate change measures should conform to best practice policy design, including the need for an evidence-based assessment of options and rigorous evaluation.

11.3.2. Other markets matter too

The ability of the ETS to deliver least cost emissions reductions will also depend in large part on the extent to which the carbon price signal is able to flow through to other markets – particularly markets for energy and transport. In this context, pursuit of structural reform and measures to improve the productivity and resilience of the economy will also be complementary to an ETS.

- This reinforces the interconnectedness of the Government's policy decisions – climate change policy cannot be made in isolation from policy in other areas and vice versa.

11.3.3. A new program suite to manage the transition and address ongoing needs

The Government has begun its consultations on the design and scope for the ETS and associated measures, with the release on 16 July 2008 of the Green Paper.

The Green Paper outlines the Government's intention to recycle revenue from the auction of permits to help Australian households and business adjust to the CPRS. The Review supports this approach. Assistance might be in two forms:

- transfers through the tax and payment system to reflect cost of living increases as a result of the introduction of a carbon price; and

- specific measures to address identified market failures or other impediments that would facilitate the community to adjust to a low carbon economy.

The Review has sought to make some suggestions as to what the latter category of measures might look like, and has proposed consolidating the Government's existing suite of 62 climate change programs into eight overarching programs as the tool to deliver this support (see Box 11.2).

Box 11.2: Future program suite

The Review proposes that the 62 climate change programs be streamlined as follows:

Transitional: programs to assist the transition to a fully functioning ETS

- **Education and information** – Australia's Low Carbon Future Program;
- **Technology** – Carbon Technology Trust;
- **Transition for business** – Climate Change Action Fund; and
- **Industry development** – Electricity Sector Adjustment Scheme.

Ongoing

- **Energy efficiency** – National Energy Efficiency Program;
- **International** – Climate Change International Program;
- **Adaptation** – Climate Change Adaptation Program; and
- **Science** – Climate Change Science Program.

The proposed eight program structure can be divided into two groups – those that are transitional and will only be required in the short to medium term, and those where there will be an ongoing role for Government action.

11.3.3.1. Transitional programs

The Review's transitional programs include the two structural adjustment measures outlined in the Green Paper – the Climate Change Action Fund and Electricity Sector Adjustment Scheme. It is understood that these measures are intended to assist parts of the economy to identify opportunities for change and to make aspects of that change more affordable.

- The Review has provided some initial views on the design of these measures based on its analysis and assessment of existing programs and current policy or program gaps.

The Review considers that possibly the most important transitional program will be a strategic information campaign which sells the CPRS (and the ETS as the primary mechanism within that policy) as the main instrument that will move Australia towards a low carbon future.

There is both a rationale and a political imperative for the Government to be investing in the development and demonstration of low emissions technologies alongside an ETS.

- What is required is a portfolio of low emissions technologies that is tailored to both leverage Australia's research strengths and meet its technology needs. The Review considers that this would be best achieved through a proposed Carbon Technology Trust.

- The Carbon Technology Trust could also provide a vehicle for the Government to facilitate the demonstration of carbon capture and storage technology at a commercial scale – should the Government find the Review's arguments in favour of doing so compelling.

11.3.3.2. Ongoing programs

In the longer-term the Review expects government action in addition to the ETS to focus on energy efficiency, adapting to unavoidable climate change, progress towards an international agreement and building an understanding of climate change science that is pertinent to Australia's circumstances.

- The Government's actions on energy efficiency should increasingly focus on facilitating the collection and provision of information rather than trying to engineer abatement solutions through measures such as increasingly stringent energy standards.
  - There may, in the short term, be a need to provide additional assistance to low income households to take up energy efficiency opportunities.
- An effective approach to adaptation is one which provides consumers and businesses with the tools and information to build the impacts of climate change into their everyday decision making.
- The motivation of domestic consumers and businesses to change their behaviour will be strengthened with the prospect of a comprehensive global agreement on carbon emissions reductions. A sound scientific understanding of the impact of climate change on Australia and its region will be an important part of what Australia brings to international negotiations.

11.3.3.3. Implementation

The Review has suggested that the Government start to implement its program recommendations as soon as possible, and that its recommendations be considered in developing the Carbon Pollution Reduction Scheme White Paper and in the context of the 2009–10 Budget. It also recommends a further review of measures be undertaken in 2011, after the ETS has commenced, for consideration in the 2012-13 Budget.

Each component of the Review's proposed future policy suite will require further design work to be undertaken prior to implementation. Part of that process will be ensuring that the policy tools and levers to be employed are fit for purpose.

- The Review's assessment of existing programs found that in many cases tools such as rebates or grants were used where they were not an effective means of targeting what was stated or understood to be the underlying policy problem.
- Identifying which policy instrument is likely to be most effective requires a clear specification of the underlying rationale for Government intervention and an understanding of the outcomes which the intervention is intended to achieve.

11.3.4. Roles, responsibilities and institutions

Lack of clarity on roles and responsibilities reflects the recent history of climate change policy in Australia. A National Climate Change Compact would help to minimise overlap, duplication and scope for policies and programs which undermine the ETS and in doing so would improve the credibility of the scheme.

- Successfully negotiating and implementing the Compact could also have flow on effects for the rest of the Government's federalism agenda.

There is also, in the Review's opinion, scope to get the Government's own house in better order to ensure greater policy coherence and better coordination of its climate change policies and programs. There are two options that the Government might wish to consider:

- centralising policy functions under the Minister for Climate Change and DCC with other Ministers and agencies delivering specific programs; or
- centralising both policy responsibility and program delivery in one Minister and agency.

Recognising the logistics involved in pursuing either option, achieving centralised policy functions may be the most pragmatic approach in the first instance. Ultimately, however, the Review recognises that this is a matter for the Government to decide.

11.4. Sensitivity analysis

The Review's recommendations still hold if the Government elects for a 'soft start' to the ETS or for an even more gradual coverage of sectors than was flagged in the Green Paper. Neither of these situations would, in the Review's thinking, create a compelling case for additional measures. What is important is that the Government set about establishing a credible price signal and a suite of other policies and programs which support that price signal impacting on decisions across the economy.

- More aggressive additional measures than the Review has recommended would only be justified if the price signal from the scheme was insufficiently credible to change decision making over the longer term. The more credible the scheme and its price signal, the less scope there will be for additional measures.
- The Green Paper indicated that the Government is disposed to cover a majority of sectors – including transport – with agriculture to be brought in gradually. As stated in its principles for complementary policies, the Review considers that providing a clear pathway to eventual coverage by the scheme is preferable to trying to design or impose broadly equivalent measures in the short term.

A further challenge for the Government will be in managing calls for targeted assistance to manage the impact of the ETS. The central challenge of structural adjustment assistance is to avoid undermining the incentives that the scheme is intended to provide. Further, in an economy close to full employment, the potential for government intervention to distort the allocation of resources away from their highest value use is more significant than at other times.

The Review considers that broad-based measures such as the structural adjustment measures flagged in the Green Paper, and in particular the recycling of revenue from the auction of permits, are the primary means by which such assistance should be delivered.

11.5. Conclusion

The Review's central conclusion is that, given a long term carbon budget, emissions trading is the most efficient mechanism to reduce emissions and it should be allowed to work. The Government has an important responsibility to establish the ETS in a way that ensures it functions efficiently. While some complementary measures will be necessary, they will not produce a superior outcome to a well-designed ETS.

Further, emissions trading will intersect with government policies, at Commonwealth, State and Territory levels, in numerous ways. The comprehensive scope of this report reflects this reality.

The introduction of an ETS is the most significant economic reform in a generation. It must be robust, transparent and, to the extent possible, simple in operation. It must allow for connection to a wider international scheme because, in the long term, reducing carbon dioxide concentrations in the atmosphere will require a comprehensive, international approach.

In this context, the Australian Government has an opportunity to be world leading – establishing an ETS and adopting a disciplined approach to additional policies and programs would demonstrate that it is possible for governments to successfully introduce an effective market-based response to climate change.

A

APPENDICES

APPENDIX 1: TERMS OF REFERENCE

Strategic Review of Australian Government Climate Change Programs

The Australian Government's climate change policy to introduce a national emissions trading scheme as the principal emissions reduction measure represents a fundamental shift in the way greenhouse gas emissions are managed.

In this context, the Australian Government has agreed to review all its existing climate change programs to:

- ensure they are complementary to the emissions trading scheme;
- phase out less efficient abatement programs and initiatives ('programs') that will compromise the abatement incentives arising from the carbon price signal delivered by emissions trading; and
- rationalise duplicative and overlapping programs.

The review will develop a set of principles to assist in assessing whether existing programs are complementary to an emissions trading scheme, and looking forward, to use in the development and implementation of future climate change measures that are complementary.

These principles are expected to include whether programs address clear market failures that are likely after the introduction of emissions trading, or which may be necessary to prepare for emissions trading. Complementary programs may also address aspects of Australia's climate change response that are not covered by emissions trading, including equity considerations.

Pending details of the Government's emissions trading scheme, the review will be guided by the Report of the Task Group on Emissions Trading. The review will also be informed by the Garnaut Climate Change Review.

Purpose

The review will recommend whether climate change programs should continue without modification, be modified to ensure consistency with an emissions trading scheme, be phased out once an emissions trading scheme is in place, including transitional arrangements, or be terminated.

In developing recommendations, the review will assess the appropriateness, effectiveness and efficiency of the existing suite of climate change programs. In doing so it will consider the Government's election commitments and assess their design to maximise effectiveness against these criteria. Recommendations may also address the appropriateness and effectiveness of existing delivery mechanisms such as regulation and tax concessions.

Appropriateness – The review will:

- assess programs for consistency with the Government's proposed emissions trading scheme;
- further assess the programs as to whether they:

- compromise abatement incentives arising from the carbon price signal delivered by emissions trading: recognising there may be a case for transitional measures as the emissions trading system matures;
- achieve abatement at least cost (if they are abatement measures);
- address identified market failures that are expected to remain after the introduction of emissions trading; and
- do not unnecessarily add to the regulatory burden;

› assess how well the programs deliver priority outcomes including:

- whether there is any duplication across programs, including with reference to state/territory programs and other relevant Commonwealth initiatives, and what could be done to remove it;
- whether the Commonwealth is the more appropriate delivery level of Government; and
- whether there would be any significant gaps in meeting the Government's climate change objectives following the introduction of an emissions trading scheme, what could be done to resolve them, and whether there are any consequences if the gaps are not addressed.

Effectiveness – The review will consider:

› whether the programs have achieved their original objectives based on existing performance indicators, and what contributed to these outcomes;

› the adequacy of the existing performance indicators;

› any unintended consequences (positive or negative) of the programs; and

› the interaction of the program with related programs, including state and territory programs.

Efficiency – The review will consider:

› whether funding has been used to efficiently deliver outputs and possible alternatives to current arrangements to more efficiently achieve the objectives;

› the impact of the programs on costs borne by the community, clients and other Governments; and

› program implementation, identifying the key causes where programs have not been well implemented.

Programs and initiatives covered by the review

The review should examine those Australian Government programs whose primary objective relates to climate change, in particular those listed in Annex A, and including the Government's election commitments listed in Annex B.

Deliverables

An in-confidence report, including an executive summary, will be provided to the Government by 31 July 2008.

Responsibilities and Governance

The review will be undertaken as a Strategic Review. The review will be headed by an independent person with strong subject matter experience. The head of the review will be supported by a review team of seconded officers. Co-ordination and monitoring of the review's progress will be undertaken by the Strategic Review Unit in Finance.

Consultation

A consultation committee comprising the Departments of the Prime Minister and Cabinet (PM&C), the Treasury, Finance and Deregulation (Finance), Climate Change (DCC), Environment, Water, Heritage and the Arts (DEWHA), Agriculture, Fisheries and Forestry (DAFF) and Resources, Energy and Tourism (DRET) will inform the review team. Other affected agencies (see below) may be invited to attend consultation committee meetings from time to time.

Confidential consultation with external stakeholders may also be conducted if required.

As the Garnaut Climate Change Review is undertaking extensive public consultation, further public consultations are not regarded as necessary to complete the review.

Affected agencies

PM&C, Finance, Treasury (Australian Taxation Office), DCC, DEWHA (Bureau of Meteorology), Department of Innovation, Industry, Science and Research (Commonwealth Scientific and Industrial Research Organisation), DRET, Department of Infrastructure, Transport, Regional Development and Local Government, DAFF (Australian Bureau of Agriculture and Resource Economics, Bureau of Rural Sciences), Department of Foreign Affairs and Trade (AusAID).

ANNEX A

Australian Government Climate Change Programs

Proposed Grouping to Assist Analysis for Review

Policy and regulatory functions (international and domestic)

- Strategic National Response
- Influencing International Climate Change Policy
- Carbon Capture and Storage – Offshore Regulatory Framework

Promoting Abatement at Least Economic Cost

Supporting the ETS

- Emissions Measurement and Analysis
- National Emissions Reporting Scheme

Other abatement measures

- Greenhouse Gas Abatement Program
- Carbon Sink Forests
- Coal Mine Methane Reduction
- Clean Energy Target – Office of Renewable Energy Regulation
- Alternative Fuels Conversion Program
- Greenhouse Challenge Plus
- National Average Fuel Consumption Target

Supporting RD&D for low emission technologies

- Carbon Neutral Energy Security
- Asia Pacific Partnership (APP)
- Low Emissions Technology Demonstration Fund
- Renewable Energy Development Initiative
- Advanced Electricity Storage Technologies
- Low Emission Technology and Abatement
- Renewable Energy Commercialisation Program
- Geothermal Technology Road map
- Hydrogen Technology Road map
- Wind Forecasting Capability
- ARC Centre for Solar Energy Systems
- Renewable Energy Equity Fund
- CRC for Greenhouse Gas Technologies (CO2 CRC)
- CRC for Coal and Sustainable Development
- CSIRO Energy Transformed Flagship

Improving Energy Efficiency

- Action on Energy Efficiency
- Phase out of Inefficient Light Bulbs
- Energy Efficiency Opportunities
- Challenge Plus – Industry Partnerships (Generator Efficiency Standards)
- Solar Cities

Supporting households and communities to reduce emissions

- Green Vouchers for Schools
- Photovoltaic Rebate Program
- Solar Hot Water Rebates
- Local Greenhouse Action
- Renewable Remote Power Generation Program
- Small Business and Household Action Initiative
- Greenhouse Action in Regional Australia
- Green Vehicle Guide

Adaptation and science

- National Climate Change Adaptation Program
- Climate Change Science Program
- Australian Centre for Climate Change Adaptation
- CSIRO Prediction and Adaptation Flagship
- Managing Climate Variability

Other International Programs

- Global Initiative on Forests and Climate
- Asia-Pacific Forestry Skills and Capacity Building Program
- Engagement in other Climate Change Forums

The review will not examine the following:

- fuel taxation arrangements;
- support provided to the biofuels industry for purposes other than climate change objectives; or
- nuclear related programs.

ANNEX B

Election Commitments

- International Climate Change Strategy
- Adaptation in the South Pacific
- Global Deforestation Initiative
- National Adaptation Plan and Iconic Areas
- Climate Change Adaptation for Coastal Communities
- Plan for Primary Industries
- Climate Change Adaptation Partnerships Program
- Climate Change Productivity Research Program
- Climate Change Adjustment Program
- Solar Homes – Solar Schools
- Green Loans
- National Solar Schools Plan
- Solar Homes and Community Plan – photovoltaic rebates
- Climate Friendly Hot Water
- One Stop Green Shop
- Expanded Solar Cities
- Green Precincts
- Sustainable housing tool
- Greenhouse and Energy Minimum Standards – 10 star
- Solar Green Energy and Water Renovations Plan – Green Loans
- National Rainwater/Greywater Plan
- Low emissions plan for renters – insulation rebate
- Mandatory Renewable Energy Target 45,000GWh in 2020
- Clean Government
- National Standard for Carbon Offsets
- Australia as the Clean Energy Hub of the Asia-Pacific Region
- Clean Energy Enterprise Connect Centre
- Clean Energy Export Strategy
- Green Car Innovation Fund
- Green Car Challenge
- Clean Energy Plan
- Renewable Energy Fund
- Clean Business Australia – Green Building Fund
- Clean Business Australia – Retooling for Climate Change
- Clean Business Australia – Climate Ready
- Energy Innovation Fund
- National Clean Coal Fund

APPENDIX 2: PROGRAM LIST

Climate change programs

The Review has established a list of 62 climate change related programs and election commitments to be reviewed. This aggregate number differs slightly from the terms of reference as:

- the terms of reference did not align election commitments with existing programs, even though a number of election commitments involve the continuation of an existing program;
- some programs were listed in the terms of reference twice under different names;
- two election commitments have been removed from the list on the basis that they are not considered to be climate change programs – specifically the National Rainwater/Greywater Plan and the National Adaptation Plan for Iconic Areas; and
- an additional Australian Research Council Centre of Excellence was identified as being of interest to the Review.

A full list of programs is below.

Abatement

Carbon Sink Forests
Carbon Dioxide Capture and Geological Storage – Offshore Regulatory Framework
Coal Mine Methane Reduction
Greenhouse Challenge Plus (including GES & GF)
Greenhouse Gas Abatement Program (GGAP)
Hot Water System Phase Out
Low Emissions Technology and Abatement
National Average Fuel Consumption Target
Greenhouse Action in Regional Australia
Emissions Measurement and Analysis
National Greenhouse and Energy Reporting Scheme
Strategic National Response

Adaptation and science

Climate Change Adaptation Program (previously the Australian Centre for Climate Change Adaptation)
Climate Change Science Program
CSIRO Prediction and Adaptation Flagship
Climate Change Adaptation Partnerships Program
Climate Change Research Program
Managing Climate Variability
National Climate Change Adaptation Program

Energy efficiency

One Stop Green Shop
Green Vehicle Guide

Action on Energy Efficiency
Energy Efficiency of Electrical Appliances
Energy Efficiency Opportunities
Green Loans
Low Emissions Plan for Renters – Insulation Rebate
Phase out inefficient light globes
Solar Cities and Green Precincts
Local Greenhouse Action
Small Business and Household Action Initiative

Industry development

Clean Business Australia – Retooling for Climate Change
Clean Energy Enterprise Connect Centre
Climate Change Adjustment Program
Green Car Innovation Fund
National Solar Schools Plan
Renewable Remote Power Generation Program (RRPGP)
Solar Homes and Communities Plan (PVRP)
Solar Hot Water Rebates
Alternative Fuels Conversion Program
Clean Business Australia – Green Building Fund
Renewable Energy Target – funding for ORER
Wind Energy Forecasting Capability

International

Adaptation in the South Pacific – Pacific Climate Change Strategy
International Forest Carbon Initiative (replaces the Global Initiative on Forests and Climate)
Asia Pacific Partnership (APP)
International Climate Change Strategy (replaces Influencing International Climate Change Policy)

Technology development and demonstration

Australian Research Council (ARC) Centre of Excellence for Solar Energy Systems
Australian Research Council (ARC) Centre of Excellence for Advanced Silicon Photovoltaics and Photonics
Cooperative Research Centre (CRC) for Coal in Sustainable Development
Cooperative Research Centre (CRC) for Greenhouse Gas Technologies
CSIRO Energy Transformed National Research Flagship
Clean Business Australia – Climate Ready
Energy Innovation Fund
Low Emissions Technology Demonstration Fund (LETDF)
National Clean Coal Fund
Renewable Energy Development Initiative (REDI)
Renewable Energy Equity Fund
Renewable Energy Fund
Advanced Electricity Storage Technologies
Geothermal and Hydrogen Technology Roadmaps
Renewable Energy Commercialisation Program

APPENDIX 3: PUBLIC CONSULTATION

Public submissions

The Review was informed by views from a wide range of stakeholders.

On 23 April 2008, the Department of Finance and Deregulation issued a media release on the Review's behalf, calling for public submissions by 20 May 2008. An advertisement appeared in The Weekend Australian on 3–4 May 2008.

A total of 56 submissions were received from private individuals, companies, industry groups, non-government organisations and community groups. One submission from a government agency from Western Australia was also received. A list of the submissions received is provided below.

Key issues addressed in the submissions included the following:

- There was broad support to streamline existing climate change programs across jurisdictions, particularly among businesses that are subject to similar schemes at a Commonwealth and State level.
- The area most frequently cited as requiring support in addition to an ETS was research, development and demonstration activities associated with climate change science and low emissions technology.
- There was general support for the need to assist households on low or fixed incomes in adjusting to the impact of an ETS – both in terms of monetary compensation through the tax and social security system and targeted assistance in relation to energy efficiency.
- A number of submissions also dealt with broader issues such as the case for and against taking action in relation to climate change and the design of an emissions trading scheme which the Review found helpful as context for its deliberations.
- Some submissions provided useful comments on specific programs – notably Greenhouse Challenge Plus, Energy Efficiency Opportunities and the RET– with a range of views on their costs and benefits.

Consultation meetings

In addition to its public submissions process the Review undertook a number of face-to-face meetings with stakeholders. To the extent possible, where an individual or organisation requested a meeting efforts were made to facilitate a meeting with either Mr Wilkins or the Review Team. These consultation meetings covered a wide range of stakeholders.

In conducting consultation meetings, the Review encouraged stakeholders to present their views on how they would define the concept of 'complementary measures' and what that might mean in practice. This proved to be a useful exercise and informed the Review's development of its principles for complementary policies and their application.

Submissions received by the Review

A3P
AGL
Alcoa
Alternative Technology Association
Asciano
Australasian Railway Association
Australian Aluminium Council
Australian Coal Association
Australian Conservation Foundation
Australian Consumer Association (Choice)
Australian Industry Greenhouse Network
Australian Industry Group
Australian Petroleum Production and Exploration Association
Australian Psychological Society
Australian Sugar Millers Council
BP Australia
Business Council of Australia
Carbon Sense Coalition
Cement Industry Federations
CFMEU
Chamber of Minerals and Energy WA
Chevron
Clean Energy Council
Consumer Law Action Centre
Cool NRG
CSR Limited
Jim Dunlop
Energy Networks Association
Energy Strategies Pty Ltd
Energy Supply Association of Australia
Energy Users Association of Australia
Environment Business Australia
ERM Power
ExxonMobil
Peter Gallagher
Hydro Tasmania
IAG
Tim Kelly
Kildonan Uniting Care
Richard Koener
Associate Prof Philip Laird
Landgate, WA Government
Minerals Council of Australia
Ian Moore
National Generators Forum
Nature Conservation Council of New South Wales
Northern Alliance for Greenhouse Action
Origin Energy
Prof Alan Pears
Queensland Resources Council
Rheem
Laurelle Russell-Atkinson
Sumitomo Drive Technologies
Total Environment Centre
Woodside Petroleum
Harley Wright

APPENDIX 4: PROGRAM RECOMMENDATIONS

This appendix summarises the Review's findings and recommendations regarding the 62 climate change programs, and the actions to be taken in the 2009–10 Budget process. It has three parts:

- a table that lists the programs, findings and recommendations;
- a key to the table that explains the colour coding in it; and
- an explanation of the proposed 'new' programs.

An overview of the proposed 'new' suite of eight climate change programs is discussed below. The programs aim to address key areas of action expected to be needed to support the ETS and assist individuals, households, communities and businesses in transitioning to a low-carbon economy. The table and key follows.

- Please note that all figures were provided by the Department of Finance and Deregulation, but may not reflect internal reallocations or other variations made by agencies. The figures are indicative only and are the best information available to the Review at 27 July 2008, of the underlying fiscal impact of all programs.

Revised suite of climate change programs

The Review proposes that the current 62 climate change programs be rationalised under eight overarching programs in order to:

- focus national action and resources on key priorities and outcomes; and
- better communicate Government actions on climate change.

The proposed new programs are as follows:

Transitional: programs to assist the transition to a fully functioning ETS

- **Education and information** – Australia's Low Carbon Future Program;
- **Technology** – Carbon Technology Trust;
- **Transition for business** – Climate Change Action Fund; and
- **Industry development** – Electricity Sector Adjustment Scheme.

Ongoing

- **Energy efficiency** – National Energy Efficiency Program;
- **International** – Climate Change International Program;
- **Adaptation** – Climate Change Adaptation Program; and
- **Science** – Climate Change Science Program.

The following provides an overview of the proposed eight programs and suggestions as to their objectives, scope and delivery arrangements. All programs would have clearly specified objectives, key performance indicators, risk management and exit strategies. The details would need to be worked out in due course.

- Where the Review recommends that programs be integrated, this provides scope to re-define measures in the light of the review's principles. The idea is that consolidation will provide resources to be reallocated to better support achieving the Government's objectives.

Programs to assist the transition to fully functioning ETS

Consistent with the principles of complementarity and the conditions for decision making (motivation, information, opportunity and affordability), the Review proposes four programs to support the transition to a fully functioning ETS.

Australia's Low Carbon Future (ALCF)

Objective: To inform and educate the Australian community on emissions trading and the transition to a low carbon economy.

Scope: Australia's Low Carbon Future would be a holistic strategic information and education campaign, containing targeted sub-programs to improve community understanding of:

- the nature and operation of emissions trading;
- the roles of different levels of government and what they are doing; and
- actions that can be taken by individuals, households, communities and businesses to reduce their emissions and to improve their use of energy.

The program should encompass a wide range of media and paths for information dissemination. It would have a strong education and capability building component.

Approach: Australia's Low Carbon Future will be a complex and enduring program and should begin prior to the commencement of the ETS to assist with the introduction of the scheme.

Program rationalisation: There do not appear to be any current programs of sufficient scope and scale to deliver the outcome proposed for this program. However, resources could be reallocated from within existing related programs to support this exercise. Existing programs to be incorporated as sub-programs include:

- Green Vehicle Guide;
- National Solar Schools Plan (program amended to focus on how energy is used including energy efficiency and smart meters in schools);
- One Stop Green Shop;
- Green Precincts; and
- Small Business and Household Action Initiative.

Technology: Carbon Technology Trust (CCT)

Objective: To accelerate the availability and take-up of new low emissions technologies by supporting its development and demonstration.

Scope: To support the development and demonstration of low emissions technologies for the benefit of the Australian economy.

Description: An independent entity funded by the Government and charged with providing funding to support the development and demonstration of low emissions technologies.

Approach: The Trust would be required to build a balanced portfolio of technologies and have the flexibility to choose the level of support it would provide to any project it decides to support. It would be able to leverage investments from the private sector and from State governments, and be required to achieve an appropriate rate of return. The Trust would be at arms length from government, but still receive general directions from it, along similar lines to the Future Fund.

Subprograms: To be developed by the Trust as it sees fit.

Program rationalisation: existing programs to be incorporated into the Trust:

- Clean Business Australia – Climate Ready;
- Energy Innovation Fund;
- National Clean Coal Fund; and
- Renewable Energy Fund.

Issues: Further development of the concept of the Trust will require careful consideration of the governance structure for the Trust.

Climate Change Action Fund (CCAF)

Objective: To facilitate the restructuring of business inputs – labour and capital – following the introduction of a carbon price.

Scope: Businesses in those sectors or industries not receiving free permit allocation and are not part of the Electricity Sector Adjustment Scheme (see below).

Description: The Government's CPRS Green Paper outlined that the CCAF would provide businesses with 'partnership funding' to support:

- capital investment in innovative new low emissions processes;
- industrial energy efficiency projects with long payback periods; and
- dissemination of best and innovation practice among small to medium sized enterprises.

Approach: Consistent with the Green Paper, the CCAF would have two components – information provision and other support to facilitate business restructuring, possibly delivered as subsidies in the form of tax rebates or grants. The exact approach would need to be determined in line with the underlying market failure or issue that needed to be resolved.

Subprograms: The CCAF would have five main elements:

- Climate Action in Enterprise (CAE) – a program modelled on Greenhouse Challenge Plus that disseminates 'best practice' to small to medium enterprises;
- Carbon offsets standards and verification – a program building on Greenhouse Friendly to ensure quality and integrity of claimed carbon offsets;
- Energy Efficiency Opportunities – the existing program, which may need to be expanded – for example, it could be voluntary for businesses currently under the threshold.
- The Climate Action Tax Rebate – businesses would be entitled to a tax rebate of a certain percentage of the costs of implementing energy efficiency improvements identified through EEO or certified as 'best practice' under CAE, over a period of time. Entitlements could be subject to an annual cap and/or an overall limit (among other things).
- The Greener Skills Initiative – the Initiative would support:
  - retraining and up-skilling in a range of professions including, engineering, industrial design, environmental sciences, energy auditors etc. The exact delivery mechanism would differ between professions and would need to work in concert with broader education and training reforms; and
  - accreditation of energy auditors and other 'green' professionals, which could be done directly by the Government but preferably in partnership with industry associations.

Program rationalisation: Existing programs to be incorporated into the CCAF:

- Clean Business Australia – Green Building Fund;
- Clean Business Australia – Retooling for Climate Change;
- Information and education components of Greenhouse Challenge Plus; and
- Energy Efficiency Opportunities.

Electricity sector adjustment scheme (ESAS)

Objective: To facilitate the adjustment of Australia's electricity sector to the impact of the CPRS.

Scope: The Green Paper indicated that the Government is disposed to deliver a 'limited amount of direct assistance to existing coal-fired electricity generators' through the ESAS, which would also deliver support to other, related strongly-affected industries, workers and communities.

Description: The Green Paper also indicated that the scheme would seek to:

- underpin investor confidence in the sector;
- facilitate structural adjustment; and
- ensure longer-term energy security through the greater use of renewable energy in electricity generation.

Approach: the ESAS would be a time limited program and comprise a number of sub-programs.

Sub-programs: the Review's initial thinking is that the ESAS could have three components:

- The Expanded National Renewable Energy Target (RET) – reflecting that the RET is essentially an industry development initiative for renewable energy, it could be brought under the auspices of the ESAS.
- Renewable Energy Integration Initiative (REII) – the REII would fund activities to assist in the successful integration of a larger amount of renewable energy into electricity networks (driven by both the RET and CPRS). For example, REII could fund investment in better energy forecasting techniques and technologies and the development of technical standards and codes.
- Adjustment Assistance Allowances – could take the form of grants, tax rebates or free permits to strongly affected firms, individuals and communities. As noted in the Green Paper, 'different delivery mechanisms may be required for different elements of the ESAS'.

Issues: There would be synergies between ESAS and the Review's proposed Carbon Technology Trust, which will invest in the development and demonstration of low emissions technologies in the electricity sector – among other things. The National Climate Change Compact could also help to support investor confidence in the electricity sector by clarifying roles and responsibilities in relation to climate change generally and by facilitating energy market reform.

Program rationalisation: As noted above, the ESAS would incorporate the RET (and funding for the Regulator). The REII would be modelled on the current Wind Energy Forecasting Capability program.

Ongoing programs

Consistent with the principles of complementarity and the conditions for decision making (motivation, information, opportunity and affordability), the Review proposes four programs that would address underlying market failures expected to be ongoing.

National Energy Efficiency Program (NEEP)

Objective: To overcome significant barriers to the take up of energy efficiency opportunities in the Australian economy.

Sub programs: NEEP would consist of four sub-programs:

- National leadership;
- Energy efficiency standards;
- Assistance for low income households; and
- Information and education.

National leadership

Objective: To (a) streamline and coordinate a nationally consistent approach to energy efficiency and greenhouse standards, including information and (b) reduce the Commonwealth's carbon footprint.

Approach: (a) Take a leadership role through COAG to develop and implement a national agreed framework covering all energy efficiency regulatory initiatives, particularly in the national markets, appliances, transport and buildings. This would involve revisiting the role of the National Framework on Energy Efficiency. For (b) this would involve the Commonwealth applying the Energy Efficiency Opportunities framework to its own operations.

Energy Efficiency Standards

Objective: To address instances where significant transaction costs or information asymmetries act as a barrier to the take of energy efficiency opportunities in relation to appliances, electric motors, buildings and transport.

Scope: The weighting between voluntary actions and mandatory minimum standard setting should progressively shift towards the former. Information provision, including disclosure, is likely to continue to be important to address market failures.

Intervention should be subject to a rigorous cost benefit analysis (regulatory impact statement) and only occur if it is going to lead to a net public benefit.

Approach: Continue but refine the current work program for introducing and maintaining energy efficiency standards, with a focus on information disclosure and other information provision activities to assist consumers make decisions on prospective purchases. This should not include the phase out of electric hot water systems particularly for existing buildings.

Program rationalisation: Sub-program would subsume the current programs below:

- Action on Energy Efficiency;
- Phase out of Inefficient Light Globes;
- Electric Hot Water System Phase out; and
- Energy Efficiency of Electrical Appliances.

Assistance for Low Income Households

Objective: Increase the understanding of energy efficiency (including of ways in which energy efficiency can be improved) by low income households (lowest two quintiles as the priority group) and assist where necessary to implement energy efficiency improvements.

Scope: To improve the capacity of low income households to improve their energy efficiency and ameliorate the impact of the ETS price signal without undermining the ETS.

Approach: This could be done by providing practical, customised information, primarily through energy audits. In the first instance, solutions could be about simple ways for households to be more efficient in their use of energy, but would be backed by a fund that could be drawn on for capital improvements should they be considered necessary. Funding would be reallocated from existing programs.

Delivery: The sub-program could (at least in part) be delivered by NGOs (possibly other community workers/organisations) in partnership with energy retailers (as the holders of information on individuals' energy consumption and as energy services providers). Households targeted would include renters (to address split incentives).

Program rationalisation: The sub-program would subsume the current programs below:

- Green Loans;
- Low Emissions Plan for Renters;
- Remote Renewable Power Generation Program;
- Solar Homes and Community Program;
- Local Greenhouse Action; and
- Solar Hot Water Rebates.

Information for policy design

Objective: To (a) provide evidence to underpin energy efficiency policy development, and (b) demonstration projects for individuals, businesses and communities to understand how to improve their energy efficiency.

Scope: This would build on the work of Solar Cities in terms of understanding how agents actually behave when facing cost-reflective pricing and using PV panels and other renewable technology. It would use demonstration projects to both underpin government decision making and community and individual understanding of what they can do. Demonstration activity would be particularly relevant to small and medium business not captured by other measures, particularly in the transport and agriculture sectors.

Program rationalisation: Solar Cities would continue in its current form under this sub-program.

Climate Change International Program (CCIP)

Objective: To build a global response to climate change which includes:

- all major emitters committing to act, with differentiated commitments for developing countries;
- robust market mechanisms needed to drive cost-effective action;
- support vulnerable countries to adapt; and
- low emissions technology to be developed and widely deployed.

Scope: The CCIP provides a strategic framework for the government to implement its international priorities, strengthen coordination between like activities across and between agencies, and help communicate what the Commonwealth is doing internationally.

Approach: The revised program structure should be implemented from the 2009–10 Budget. Policy aspects of the current International Climate Change Strategy program should be funded and delivered as core departmental business from 2009–10.

Subprograms and program rationalisation: The CCIP would include the following sub programs:

- International Climate Partnerships sub program: made up of bilateral activities and international convention payments; and

Existing programs:

- International Adaptation to Climate Change Initiative;
- International Forest Carbon Initiative; and
- Asia-Pacific Partnership for Clean Development and Climate.

Climate Change Adaptation Program (CCAP)

Objective: Promote and support Australia's understanding of the causes, nature, timing and consequences of climate change to:

- improve Australia's knowledge of climate change impacts;
- strengthen the capability of decision-makers to respond; and
- address major areas of vulnerability in Australia.

Scope: The CCAP is recommended to deliver a more strategic approach to government activities, strengthen coordination between like activities across and between agencies and jurisdictions, and help communicate what the Commonwealth is doing in this important area. The program will also support development of next generation national adaptation policy.

Approach: The revised program structure should be implemented from the 2009–10 Budget.

Issues: The outcomes of the review of the National Innovation System will need to be taken into account in relation to the CSIRO Climate Adaptation Flagship. Nevertheless, the Flagship will need to have robust coordination arrangements with CCAP.

Note that structural adjustment support for farmers to exit farming should be considered in the context of broader agricultural support, and will be subject to the outcomes of the Drought Review.

Proposed sub programs:

- National Adaptation Framework Program – to support development of a national adaptation framework through COAG and provide resourcing for priority initiatives.
  - This may include support for the proposed National Adaptation Advisory Board.
- Agriculture Climate Change Program – to assist farmers to understand and manage the impacts of climate change, including improved seasonal forecasting and risk management.
  - This may include funding for agriculture sector adaptation research.

Program rationalisation: Existing programs to be incorporated into the CCAP:

- Climate Change Adaptation Program (existing program established in 2007-08);
- Climate Change Adaptation Partnerships Program;
- Climate Change Adjustment Program;
- Climate Change Research Program; and
- Managing Climate Variability.

Climate Change Science Program (CCSP)

Objective: Improve Australia's understanding of the causes, nature, timing and consequences of climate change so that industry, community and government decisions can be better informed.

Scope: The Commonwealth should develop and implement, through COAG, a comprehensive national climate change science agenda. The national approach will provide a framework for strategic approach to government activities, strengthen coordination between like activities across and between agencies and jurisdictions, and help communicate what the Commonwealth is doing in this important area.

Approach: The revised program structure should be implemented from the 2009–10 Budget.

Program rationalisation: Not required. Establish the Climate Change Science Program in 2009–10 to replace the current program (Australian Climate Change Science Program) which lapses in 2008–09.

Program Rationalisation: Other Programs

Of the 62 programs considered by the Review, 35 have been identified above in terms of how they might be rationalised under proposed new programs. In addition, four programs have already terminated.

The Review proposes a range of actions for the remaining 23 programs, including:

- cease as a discrete program and be delivered and resourced as core departmental business by the relevant department;
- reassess ongoing need for the program in the light of other current reviews; or
- terminate the program in 2008–09, or later.

The programs are listed below under each recommended action grouping. Table A4.1 below provides summary details explaining the recommended action.

- Deliver as core departmental business.
  - Emissions Measurement and Analysis; Carbon Dioxide Capture and Geological Storage – Offshore Regulatory Framework; National Greenhouse and Energy Reporting Scheme; Strategic National Response; and Geothermal and Hydrogen Technology Roadmaps.
- Continue program: Assess following outcome of other reviews.
  - Clean Energy Innovation Centre; Australian Research Council (ARC) Centre of Excellence for Solar Energy Systems; ARC Centre of Excellence for Advanced Silicon Photovoltaics and Photonics; Cooperative Research Centre (CRC) for Greenhouse Gas Technologies; CSIRO Energy Transformed National Research Flagship; and Green Car Innovation Fund.
- Terminate 2008–09
  - Coal Mine Methane Reduction; Greenhouse Action in Regional Australia; Greenhouse Challenge Plus (including GES and GF); Greenhouse Gas Abatement Program (GGAP); Low Emissions Technology and Abatement; Nation Wind Energy Forecasting Capability; and National Climate Change Adaptation Program.

- Terminate post 2008–09
  - Advanced Electricity Storage Technologies; Renewable Energy Development Initiative (REDI); Carbon Sink Forests; Renewable Energy Equity Fund; and Low Emissions Technology Demonstration Fund (LETDF).
- Terminated pre 2008–09
  - Cooperative Research Centre (CRC) for Coal in Sustainable Development; National Average Fuel Consumption Target; Alternative Fuels Conversion Program; and Renewable Energy Commercialisation Program.

Institutional Structure

The Review recommends that a number of existing programs be funded as part of departmental core business, and that over time all programs be centralised in DCC – that is that all climate change policy decisions be made in DCC, and all climate change related programs be administered by DCC.

The following table focuses on decisions in the 2009–10 Budget, which would begin the process of streamlining climate change programs. It is expected that this process should be completed within a normal four year budget cycle.

Table A4.1 summarises the Review's recommendations for Government action in the 2009-10 Budget and the key to the table follow.

Key to Table A4.1

Colour	Review finding	Recommended action for 2009–10 Budget
Red (16 programs)	**Not complementary, superseded by ETS** – the program's objectives and functions are superseded by the ETS and the introduction of a carbon price. **Superseded by another program** – a new program has been introduced that replaces the existing program. **Not complementary** – program is not least cost, or unlikely to be able to be delivered successfully in current form (essentially does not meet any of the principles).	**Terminate program in 2008–09** – terminate the program, but honour any outstanding contractual obligations. **No new commitments** – make no new commitments and terminate at the earliest opportunity. **Do not implement** – immediately cease implementation of the new program. **Do not continue past lapsing date of 2008–09** – program is due to lapse in 2008–09 and should not be continued or extended beyond 2008–09. **Cease as planned** – allow the program to terminate as currently planned and do not extend or continue the program past the current end date.
Orange (15 programs)	**Transitional** – the program has a rationale in the transition to an ETS and in the early phase of its operation. **Transitional, only if modified** – the program has a rationale in the transition to an ETS, but would need to be changed in order to be effective.	**Continue in current form** – continue in current form and review in 2011. **Integrate as subprogram of an overarching program** – consolidate the program as a subprogram of an overarching program, and review program objectives and delivery. Refocus objectives as identified in text.
Yellow (22 programs)	**Complementary, should deliver as departmental core business** – the program is complementary, but should be part of the core business of the department, rather than a discrete program. **Complementary, only if modified** – for the program to be complementary, changes must be made to improve its effectiveness.	**Cease as a discrete program in 2008–09 and deliver as departmental core business from 2009–10** – the program's activities are part of the relevant department's core business and should be funded as such. **Integrate as subprogram of an overarching program** – consolidate the program as a subprogram of an overarching program and redesign to better deliver objectives. **Amend or refocus objectives** to improve policy effectiveness as outlined in text. **Assess following the outcome of another review** – assess the need for the program in the context of the findings and recommendations of another relevant review.
Green (9 programs)	**Complementary** – the program is complementary to an ETS or addresses an appropriate objective and does not require alteration.	**Integrate as subprogram of an overarching program** – consolidate the program as a subprogram of a consolidated program. **Cease as planned** – allow the program to terminate as currently planned. This does not preclude other measures seeking to address these issues coming forward in the future.

Table A4.1: Summary of Climate Change Program Recommendations

Portfolio	Status[77]	Program[78]	2008–09 ($ mil)	2009–10 ($ mil)	2010–11 ($ mil)	2011–12 ($ mil)	Total ($ mil)	Review Finding	Recommended action – for 2009–10 Budget
Abatement									
DCC	EP(GC)	Emissions Measurement and Analysis	8.2	0.0	0.0	0.0	8.2	Complementary, should deliver as departmental core business	Cease as a discrete program in 2008–09 and deliver and resource as part of ongoing departmental core business from 2009–10
DRET	EP(GC)	Carbon Dioxide Capture and Geological Storage – Offshore Regulatory Framework	0.0	0.0	0.0	0.0	0.0	Complementary, should deliver as departmental core business	Cease as a discrete program in 2008–09 and deliver as departmental core business from 2009–10
DEWHA	GC	Hot Water System Phase Out	0.0	0.0	0.0	0.0	0.0	Complementary, only if modified	Integrate as subprogram of the National Energy Efficiency Program
DCC	EP(GC)	National Greenhouse and Energy Reporting Scheme	4.7	4.6	5.3	5.1	19.7	Complementary, should deliver as departmental core business	Cease as a discrete program in 2008–09 and deliver as departmental core business from 2009–10
DCC	EP(GC)	Strategic National Response	7.0	0.0	0.0	0.0	7.0	Complementary, should deliver as departmental core business	Cease as a discrete program in 2008–09 and deliver and resource as ongoing departmental core business from 2009–10
Treasury	EP(GC)	Carbon Sink Forests	5.0	9.0	11.0	13.0	38.0	Transitional, superseded by ETS	No new commitments
DEWHA	EP	Coal Mine Methane Reduction	5.6	2.3	4.4	4.4	16.8	Not complementary, superseded by ETS	Terminate program in 2008–09, but honour all contractual obligations

77 **EP** = Existing program – no Government commitment to continue at this stage **EP(GC)** = Existing program which the Government has committed to continuing
GC = Government commitment to establish a new program

78 Programs are listed by colour and then in alphabetical order

Portfolio	Status[77]	Program[78]	2008–09 ($ mil)	2009–10 ($ mil)	2010–11 ($ mil)	2011–12 ($ mil)	Total ($ mil)	Review Finding	Recommended action – for 2009–10 Budget
DCC	EP	Greenhouse Action in Regional Australia	5.4	0.0	0.0	0.0	5.4	Not complementary, superseded by the Climate Change Adaptation Partnerships Program	Do not continue program past the lapsing date of 2008–09
DEWHA	EP	Greenhouse Challenge Plus (including GES and GF)	8.8	0.0	0.0	0.0	8.8	Not complementary, superseded by ETS	Do not continue program past the lapsing date of 2008–09. Continue information and capacity building activities through the Climate Change Action Fund or the Enterprise Connect centres
DEWHA	EP	Greenhouse Gas Abatement Program (GGAP)	7.5	5.4	0.5	0.0	13.5	Not complementary, superseded by ETS	Terminate program in 2008–09, but honour all contractual obligations
DEWHA	EP	Low Emissions Technology and Abatement	9.0	5.0	2.0	0.0	16.0	Not complementary, superseded by ETS	Do not continue past lapsing date of 2008–09
Sub-total			*61.2*	*26.3*	*23.2*	*22.5*	*133.4*		
Adaptation and science									
DIISR	EP	CSIRO Climate Adaptation Flagship	10.3	10.9	15.3	0.0	36.5	Complementary	Assess following the outcome of the review of the National Innovation System. Ensure robust coordination of activities with Climate Change Adaptation Program
DCC	EP(GC)	Climate Change Adaptation Program (previously the Australian Centre for C. C. Adaptation)	23.8	24.9	29.3	29.4	107.4	Complementary, only if modified	Rename and integrate as subprogram of the Climate Change Adaptation Program.

Portfolio	Status[77]	Program[78]	2008–09 ($ mil)	2009–10 ($ mil)	2010–11 ($ mil)	2011–12 ($ mil)	Total ($ mil)	Review Finding	Recommended action – for 2009–10 Budget
DAFF	GC	Climate Change Adaptation Partnerships Program	7.2	7.2	7.2	7.2	28.8	Complementary, only if modified	Integrate as subprogram of the Climate Change Adaptation Program. Assess in context of outcomes of Drought Review
DCC	EP	Australian Climate Change Science Program	8.7	0.0	0.0	0.0	8.7	Complementary, only if modified	Amend objectives from 2009–10 (or sooner) to also focus on development of a national approach on climate change science
DAFF	EP	Managing Climate Variability	0.0	0.0	0.0	0.0	0.0	Complementary, only if modified	Integrate as subprogram of the Climate Change Adaptation Program. Assess in context of outcomes of Drought Review
DAFF	GC	Climate Change Research Program	11.6	11.6	11.6	11.6	46.2	Complementary, only if modified	Integrate as subprogram of the Climate Change Adaptation Program. Assess in context of outcomes of Drought Review
DCC	EP	National Climate Change Adaptation Program	4.2	0.0	0.0	0.0	4.2	Not complementary as program has been superseded by Climate Change Adaptation Program	Do not continue past the lapsing date of 2008–09
Sub-total			*65.8*	*54.6*	*63.4*	*48.2*	*231.8*		
Energy efficiency									
DEWHA	GC	One Stop Green Shop	1.0	1.0	1.0	0.0	3.0	Complementary	Integrate as subprogram of Australia's Low Carbon Future
Transport	EP	Green Vehicle Guide	0.0	0.0	0.0	0.0	0.0	Complementary	Integrate as subprogram of Australia's Low Carbon Future

Portfolio	Status[77]	Program[78]	2008–09 ($ mil)	2009–10 ($ mil)	2010–11 ($ mil)	2011–12 ($ mil)	Total ($ mil)	Review Finding	Recommended action – for 2009–10 Budget
DRET	EP	Energy Efficiency Opportunities	3.3	0.0	0.0	0.0	3.3	Transitional	Integrate into Climate Change Action Fund. Continue in current form until the current reporting cycle ends and assess ongoing need in 2011
DEWHA	GC	Green Loans	17.4	60.2	88.1	87.9	253.7	Transitional	Integrate as subprogram of the National Energy Efficiency Program.
DEWHA	EP(GC)	Green Precincts	2.0	2.1	2.1	0.0	6.2	Transitional	Integrate as subprogram of Australia's Low Carbon Future
DEWHA	EP(GC)	Solar Cities	33.6	13.4	12.5	5.6	65.1	Transitional	Continue in current form, cease as planned in 2012-13
DEWHA	EP	Action on Energy Efficiency	7.2	0.0	0.0	0.0	7.2	Complementary (information component), transitional (minimum standards) – if delivery changed to streamline management and reporting activities	Integrate as subprogram of the National Energy Efficiency Program
DEWHA	GC	Energy Efficiency of Electrical Appliances	2.0	4.1	4.0	3.9	14.0	Complementary (information component), transitional (minimum standards) – if delivery changed to streamline management and reporting activities	Integrate as subprogram of the National Energy Efficiency Program
DEWHA	EP (GC)	Phase out inefficient light globes	1.8	2.0	1.9	0.5	6.2	Complementary, only if modified	Integrate as subprogram of the National Energy Efficiency Program

Portfolio	Status[77]	Program[78]	2008–09 ($ mil)	2009–10 ($ mil)	2010–11 ($ mil)	2011–12 ($ mil)	Total ($ mil)	Review Finding	Recommended action – for 2009–10 Budget
DEWHA	GC	Low Emissions Plan for Renters – Insulation Rebate	10.5	37.5	50.0	50.0	148.0	Complementary, only if modified	Integrate as subprogram of the National Energy Efficiency Program
DEWHA	EP	Local Greenhouse Action	3.8	0.0	0.0	0.0	3.8	Not complementary	Do not continue past the lapsing date of 2008–09
DEWHA	EP	Small Business and Household Action Initiative	16.5	6.0	0.7	0.5	23.7	Not complementary because the program is not well designed	Terminate program in 2008–09 and redirect unspent funding to Australia's Low Carbon Future
Sub-total			*99.1*	*126.3*	*160.3*	*148.4*	*534.2*		
Industry development									
DRET	EP	Wind Energy Forecasting Capability	1.3	0.0	0.0	0.0	1.3	Complementary	Cease as planned in 2008–09. More research may be required to further support integration of alternative energy sources into the electricity network through the Electricity Sector Adjustment Scheme
DIISR	GC	Clean Business Australia – Green Building Fund	22.5	37.5	15.0	15.0	90.0	Transitional, only if modified (small commercial premises)	Integrate as subprogram of the Climate Change Action Fund and assess ongoing need in 2011
DIISR	GC	Clean Energy Innovation Centre	5.0	5.0	5.0	5.0	20.0	Transitional	Continue with implementation, but review as part of the evaluation of the Enterprise Connect in 2009–10
DAFF	GC	Climate Change Adjustment Program	15.0	15.0	15.0	10.0	55.0	Transitional, only if modified	Integrate as subprogram of the Climate Change Adaptation Program. Assess in the context of the Drought Review

Portfolio	Status[77]	Program[78]	2008–09 ($ mil)	2009–10 ($ mil)	2010–11 ($ mil)	2011–12 ($ mil)	Total ($ mil)	Review Finding	Recommended action – for 2009–10 Budget
DEWHA	EP	Renewable Remote Power Generation Program (RRPGP)	50.0	45.5	30.0	0.0	125.5	Transitional, only if modified	Refocus objectives to limit the program to off-grid households, small businesses and remote indigenous communities. Cease as planned in 2010–11
DIISR	GC	Clean Business Australia – Retooling for Climate Change	10.9	21.8	24.5	17.8	75.0	Transitional, only if modified	Integrate as subprogram of Climate Change Action Fund and assess ongoing need in 2011
DCC	EP(GC)	Renewable Energy Target – funding for ORER[80]	6.0	4.3	3.7	3.8	17.8	Not applicable. Regulator required to implement the Renewable Energy Target	Ongoing funding required to administer the Renewable Energy Target
DIISR	GC	Green Car Innovation Fund[81]	0.0	0.0	0.0	100.0	100.0	Complementary, if focussed on research and development	Assess following the outcome of the Review of Australia's Automotive Industry
DEWHA	EP(GC)	National Solar Schools Plan	74.6	119.7	107.2	50.8	352.3	Complementary, only if modified	Integrate into National Energy Efficiency Program and change focus to information and education, including smart meters and energy efficiency in schools.
DEWHA	EP(GC)	Solar Homes and Communities Plan (PVRP)	56.6	49.3	0.0	0.0	105.9	Complementary, only if modified	Integrate as subprogram of the National Energy Efficiency Program
DEWHA	EP(GC)	Solar Hot Water Rebates	35.0	45.0	60.0	60.0	200.0	Complementary, only if modified	Integrate as subprogram of the National Energy Efficiency Program
Sub-total			*276.9*	*343.1*	*260.4*	*262.4*	*1,142.8*		

80 Review finding and recommended action are based on the application of the Review's principles. However, the Review notes that the Government has recently affirmed it's commitment to an expended Mandatory Renewable Energy Target which would require the Office of the Renewable Energy Regulator to be funded on an ongoing basis.

81 Review finding and recommended action are based on the application of the Review's principles. However, the Review notes that the Government is committed to the program and has sought advice from the Review of Australia's Automotive Industry implementation of the Green Car Innovation Fund.

Portfolio	Status[77]	Program[78]	2008–09 ($ mil)	2009–10 ($ mil)	2010–11 ($ mil)	2011–12 ($ mil)	Total ($ mil)	Review Finding	Recommended action – for 2009–10 Budget
International									
AusAID	GC	International Adaptation to Climate Change Initiative (implemented jointly with DCC)	20.7	49.4	65.0	0.0	135.0	Complementary, only if modified	Integrate as sub program of the International Climate Change Program
DCC	EP(GC)	International Forest Carbon Initiative (replaces the Global Initiative on Forests and Climate) (implemented jointly with AusAID)	38.3	49.7	47.8	22.8	158.6	Complementary, only if modified	Integrate as sub program of the International Climate Change Program
DRET	EP	Asia Pacific Partnership on Clean Development and Climate (APP)	33.1	32.9	16.0	0.1	82.0	Complementary, only if modified	Integrate as sub program of the International Climate Change Program
DCC	EP(GC)	International Climate Change Strategy (replaces Influencing International Climate Change Policy)	6.4	0.0	0.0	0.0	6.4	Complementary, only if modified – policy aspects of program should be delivered as core business	Cease current activity as discrete program. Deliver and resource policy aspects as core departmental business. Deliver and resource other elements as subprogram of the Climate Change International Program
Sub-total			*98.5*	*132.0*	*128.8*	*22.9*	*382.0*		

Portfolio	Status[77]	Program[78]	2008–09 ($ mil)	2009–10 ($ mil)	2010–11 ($ mil)	2011–12 ($ mil)	Total ($ mil)	Review Finding	Recommended action – for 2009–10 Budget
Technology development and demonstration									
DIISR	EP	Australian Research Council (ARC) Centre of Excellence for Solar Energy Systems	0.2	0.0	0.0	0.0	0.2	Complementary	Assess following the outcome of the review of the National Innovation System
DIISR	EP	ARC Centre of Excellence for Advanced Silicon Photovoltaics and Photonics	2.7	2.2	1.0	0.0	5.8	Complementary	Assess following the outcome of the review of the National Innovation System
DIISR	EP	Cooperative Research Centre (CRC) for Greenhouse Gas Technologies	3.7	2.9	0.0	0.0	6.6	Complementary	Assess following the outcome of the review of the National Innovation System
DIISR	EP	CSIRO Energy Transformed National Research Flagship	12.3	14.9	24.3	0.0	51.5	Complementary	Assess following the outcome of the review of the National Innovation System
DIISR	GC	Clean Business Australia – Climate Ready	13.1	22.6	23.8	15.5	75.0	Transitional, only if modified	Integrate into Carbon Technology Trust
DRET	GC	Energy Innovation Fund	40.9	51.2	36.2	21.7	150.0	Transitional, only if modified	Integrate into Carbon Technology Trust
DRET	GC	National Clean Coal Fund	34.8	108.6	124.5	97.8	365.7	Transitional, only if modified	Integrate into Carbon Technology Trust
DRET	GC	Renewable Energy Fund	0.0	55.5	71.0	101.0	227.5	Transitional, only if modified	Integrate into Carbon Technology Trust
DRET	EP	Low Emissions Technology Demonstration Fund (LETDF)	96.0	137.1	35.1	77.4	345.5	Superseded by the National Clean Coal Fund and the Renewable Energy Fund	Cease as planned in 2019–20 – program closed and funding fully committed

Portfolio	Status[77]	Program[78]	2008–09 ($ mil)	2009–10 ($ mil)	2010–11 ($ mil)	2011–12 ($ mil)	Total ($ mil)	Review Finding	Recommended action – for 2009–10 Budget
DRET	EP	Renewable Energy Development Initiative (REDI)	26.2	6.7	0.7	0.0	33.6	Superseded by Climate Ready and the Energy Innovation Fund	Cease as planned in 2010–11– program closed and funding fully committed
DEWHA	EP	Renewable Energy Equity Fund	1.5	1.1	0.9	0.0	3.5	Superseded by Climate Ready and Energy Innovation Fund	Cease as planned by 2013 – funding fully committed
DRET	EP	Advanced Electricity Storage Technologies	8.1	4.4	0.0	0.0	12.5	Superseded by Climate Ready and Energy Innovation Fund	Cease as planned in 2009–10 – program closed
DRET	EP	Geothermal and Hydrogen Technology Roadmaps	0.6	0.0	0.0	0.0	0.6	Complementary, should deliver as departmental core business	Cease as planned in 2008–09
Sub-total			*240.1*	*407.2*	*317.5*	*313.4*	*1,278.2*		
Total							**3702.4**		
Terminated pre-2008–09									
DIISR	EP	Cooperative Research Centre (CRC) for Coal in Sustainable Development	0.0	0.0	0.0	0.0	0.0	Complementary	Not applicable. CRC for Coal in Sustainable Development closed on 30 June 2008
DEWHA	EP	National Average Fuel Consumption Target	0.0	0.0	0.0	0.0	0.0	Not complementary, superseded by ETS	Not applicable. Program no longer operated by the Government
DEWHA	EP	Alternative Fuels Conversion Program	0.0	0.0	0.0	0.0	0.0	Not complementary	Program terminated pre 2008–09
DEWHA	EP	Renewable Energy Commercialisation Program	0.0	0.0	0.0	0.0	0.0	Superseded by Climate Ready and the Energy Innovation Fund	Not applicable. Program ended in 2007-08

Source: All figures were provided by Finance, but may not reflect internal reallocations or other variations made by agencies. The figures are indicative only and are the best information available to the Review at 27 July 2008, of the underlying fiscal impact of all programs.

APPENDIX 5: GLOSSARY AND ACCRONYMS

Glossary

Abatement – Reduction of greenhouse gas emissions or increase of greenhouse gas removal from the atmosphere by sinks.

Adaptation – Adjustment in natural or human social or economic systems in response to actual or expected climate change that moderates harm or exploits beneficial opportunities.

Additionality – A requirement that a program or measure produce activity that is additional to any that would occur in the absence of the program or measure.

Annex I Party – Under the terms of the United Nations Framework Convention on Climate Change, Annex I countries include all developed countries and the countries in transition in central and eastern Europe, including Russia and Ukraine.

Annex B Party -Annex B of the Kyoto Protocol lists those developed countries that have agreed to a commitment to limit their greenhouse gas emissions in the period 2008-12.

Benefit principle of expenditure – which suggests that action should be taken by the jurisdiction within which the benefits are likely to accrue. If the benefit arising from the provision of a good or service in one state spills over to other states, the benefit principle suggests that the highest level of Government should intervene

Business as usual -estimate of the future pattern of greenhouse gas emissions, which assumes that there will be no major changes in attitudes and priorities of governments, business and the community.

'Cap and trade' scheme – An emissions trading regime in which a limit (or cap) is placed on the total emissions allowable from the activities or sectors covered under the scheme. Tradeable emissions units are issued up to an amount equal to the cap.

Carbon Capture and Storage (CCS) – Technology to capture and store greenhouse gas emissions from energy production or industrial processes. Captured greenhouse gases have the potential to be stored in a variety of geological sites.

Carbon – Carbon is used in the report to generally refer to the six major greenhouse gases.

Carbon dioxide (CO_2) – A naturally occurring gas; it is also a by product of burning fossil fuels and biomass, other industrial processes and land-use changes. It is the principal anthropogenic greenhouse gas that affects the Earth's temperature.

Carbon dioxide equivalent (CO_2-e) – A standard measure that takes account of the different global warming potentials of greenhouse gases and expresses the cumulative effect in a common unit.

Carbon footprint – A measure of the greenhouse gas emissions attributable to an activity; it is commonly used at an individual, household or business level.

Carbon leakage – The effect when a firm facing increased costs in one country due to an emissions price chooses to reduce, close or relocate production to a country with less stringent climate change policies.

Carbon market – A generic term for a trading system in which countries, organisations and individuals buy or sell units of greenhouse gas emissions in an effort to meet limits on emissions.

Carbon offset – Carbon offsets represent reductions in greenhouse gases relative to a business-as-usual baseline. Carbon offsets are tradeable and often used to negate (or offset) all or part of another entity's emissions.

Carbon price – the cost of emitting carbon into the atmosphere. It can be a tax imposed by government, the outcome of an emission trading market or a hybrid of taxes and permit prices. The various ways of creating a carbon price can have different effects on the economy. Also referred to as the cost of carbon emissions.

Carbon sequestration – the long-term storage of carbon dioxide in the forests, soils, oceans or underground in depleted oil and gas reservoirs, coal seams and saline aquifers. Examples include: the separation and disposal of carbon dioxide from flue gases or processing fossil fuels to produce hydrogen and carbon-rich fractions; and the direct removal of carbon dioxide from the atmosphere through land-use change, reforestation and agricultural practices to increase soil carbon.

Carbon sinks – Natural or artificial systems that absorb and store carbon dioxide from the atmosphere, including trees, plants and the oceans.

Carbon tax – A surcharge on the carbon content of products.

Clean Development Mechanism (CDM) – A mechanism under the Kyoto Protocol through which developed countries may undertake greenhouse gas emissions reduction or removal projects in developing countries, and receive credits for doing so, which they may apply towards meeting their mandatory emissions targets.

Climate change – As defined by the UNFCCC, a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability over comparable time periods.

Cogeneration – The production of two useful forms of energy such as high temperature heat (for hot water or space heating) and electricity from the same process. Also known as combined heat and power.

Coverage – The scope of an emissions trading scheme. Covered sectors are liable for their emissions under the scheme.

Covered emissions – Emissions that are covered by the emissions trading scheme

Emissions – The release of greenhouse gases into the atmosphere.

Emissions cap – See 'scheme cap'.

Emissions intensity – The ratio of emissions to output.

Energy intensity – The ratio of energy consumption to output.

Externalities (or 'spillovers') – where an individual or firm can take an action that affects others but for which it neither pays (in relation to negative externalities) nor is paid compensation (in the case of positive externalities). In the presence of externalities, a product may be oversupplied (negative externalities) or undersupplied (positive externalities).

Fuel switching – The substitution of one type of fuel for another, for example the use of natural gas instead of coal. Fuel switching changes the emissions intensity of energy production because all fuels have a different carbon content.

Geosequestration – The process of storing liquefied carbon dioxide in deep underground geological structures (see 'carbon sequestration').

Gigawatt (GW) – A unit of power equal to one billion watts.

Greenhouse effect – The trapping of heat by naturally occurring heat retaining atmospheric gases (water vapour, carbon dioxide, nitrous oxide, methane and ozone) that keeps the earth about 30°C (60°F) warmer than if these gases did not exist.

Greenhouse gases (GHGs) – Gases that cause global warming and climate change. The major GHGs are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6).

Indirect emissions – Indirect emissions are emissions generated in the wider economy as a consequence of an organisation's activities (particularly from its demand for goods and services), but which are physically produced by the activities of another organisation. Example include electricity production, 'upstream' emissions generated in the production of goods purchased or processed by the entity and 'downstream' emissions associated with transporting and disposing of products sold by the entity.

Information failures – for markets to operate efficiently, all market players need to have access to (or the ability to access) information about the goods or services being traded. It is sometimes the case that one party has less information than the other or that both parties have incomplete information.

Intergovernmental Panel on Climate Change (IPCC) – Established in 1988, the IPCC surveys worldwide scientific and technical literature and publishes assessment reports that are widely recognised as the most credible existing sources of information on climate change. The IPCC also works on methodologies and responds to specific requests from the UNFCCC's decision-making bodies.

Kyoto Protocol – An international treaty negotiated under the auspices of the UNFCCC. It entered into force in 2005. Among other things, the Protocol sets binding targets for the reduction of greenhouse gas emissions by individual developed countries to be met within the first commitment period of 2008–12.

Leakage See 'carbon leakage'.

Liable entity – An entity that has an obligation under the emissions trading scheme.

Liquid market – A market whose essential characteristic is that there are ready and willing buyers and sellers at all times.

Low emissions technology – Technology which produces a product with minimal greenhouse gas emissions. The term is commonly used to refer to power generation technologies (such as renewable, nuclear and clean coal generation), but applies equally to other sectors including transport and agriculture.

Marginal cost of abatement – The cost of reducing emissions by one additional unit.

Market failure – A situation where the market is not able to provide an efficient level of production and consumption of goods and services, including natural resources or ecosystem services. In the climate change context, this means that while greenhouse gas emissions impose a cost on society through environmental degradation, this cost is not reflected in the price of goods and services. As a result, emissions will be greater than is desirable because individuals and businesses do not face the full cost of their consumption and production decisions.

Megawatt (MW) – A unit of power equal to one million watts.

Mitigation – A human intervention to reduce the sources of, or increase the sinks for greenhouse gases.

National Electricity Market (NEM) – Wholesale market for the supply of electricity to retailers and end-users in the interconnected regions of Queensland, NSW, the ACT, Victoria and South Australia. Began operating in December 1998. Tasmania joined in 2005.

National Greenhouse and Energy Reporting System (NGERS) – The National Greenhouse and Energy Reporting System is based on the *National Greenhouse and Energy Reporting Act 2007*, which was passed on 29 September 2007. The Act establishes a mandatory reporting system for corporate greenhouse gas emissions and energy production and consumption. The Act commences on 1 July 2008. Further information is available at: http://www.greenhouse.gov.au/reporting/index.html

Price signal – See 'carbon price'.

Production leakage – The loss of economic activity from Australia to another country as a result of increases in costs caused by government intervention (for example, through a carbon cost).

Public goods – are an extreme case of positive externalities as no one individual or firm has the ability to exclude another from consuming such goods (the property of non excludability), and consumption by one does not subtract from another's ability to consume (that is, consumption is non-rivalrous).

Scheme Cap – A mandated restraint, in a scheduled time frame, that puts a 'ceiling' on the total amount of anthropogenic greenhouse gas emissions.

Sequestration – The removal of atmospheric carbon dioxide, either through biological processes (for example, photosynthesis in plants and trees), or geological processes (for example, storage of carbon dioxide in underground reservoirs).

Sovereign risk – The risk borne by business caused by changes to government policy (that is, the risk associated with changing the 'rules of the game').

Split incentives – where the interests of the producer or owner of a particular product diverge from the incentives facing the product's end users

Spot market – A market in which goods (for example, permits) are sold for cash and delivered immediately. Contracts bought and sold on these markets are immediately effective.

Stationary energy emissions – Includes emissions from fuel consumption for electricity generation; fuels consumed in the manufacturing, construction and commercial sectors; and other sources such as domestic heating.

Subsidiarity principle – a good or service should be provided by the level of government closest to the region that will benefit from the service as it is best placed to discern the preferences and circumstances of the communities and is therefore more capable of assessing the efficient level of goods and services that need to be provided.

Sunk costs/investment – Costs that have already been incurred and that cannot be recovered to any significant degree.

Trade exposed – Industries that currently export or compete against imports, or which at feasible relative prices, would do so.

UNFCCC United Nations Framework Convention on Climate Change. – An international treaty adopted after the Rio Earth Summit in 1992 and aimed at achieving the stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

Upstream – A point in the supply chain above the direct source of emissions. For example, obligations for emissions from fuel consumption may be placed on the fuel supplier, rather than the fuel user.

Acronyms

ABARE	Australian Bureau of Agricultural and Resource Economics
ACCC	Australian Competition and Consumer Commission
ACCSP	Australian Climate Change Science Program
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AFTS	Australia's Future Tax System
AGO	Australian Greenhouse Office
ANAO	Australian National Audit Office
APP	Asia Pacific Partnership on Clean Development and Climate
ARC	Australian Research Council
BOM	Bureau of Meteorology
CAE	Climate Action in Enterprise
CCAF	Climate Change Action Fund
CCS	Carbon capture and storage
CDM	Clean Development Mechanism
COAG	Council of Australian Governments
CPRS	Carbon Pollution Reduction Scheme
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Department of Agriculture, Fisheries and Forestry
DCC	Department of Climate Change
DEWHA	Department of the Environment, Water, Heritage and the Arts
DIISR	Department of Innovation, Industry, Science and Research
DRET	Department of Resources, Energy and Tourism
EEO	Energy Efficiency Opportunities
ESAS	Electricity Sector Adjustment Scheme
ETS	Emissions Trading Scheme
FBT	Fringe Benefits Tax
FIT	Feed-in-tariff
GDP	Gross Domestic Product
GEMS	Greenhouse and energy minimum standards
GGAP	Greenhouse Gas Abatement Program
GWh	Gigawatt hour

IDC	Interdepartmental committee
IEA	International Energy Agency
IPCC	International Panel on Climate Change
KPIs	Key performance indicators
kW	Kilowatt
LETDF	Low Emission Technology Demonstration Fund
MCE	Ministerial Council on Energy
MEPS	Minimum Energy Performance Standards
MRET	Mandatory Renewable Energy Target
NABERS	National Australia Built Environment Rating System
NAAB	National Adaptation Advisory Board
NEEP	National Energy Efficiency Program
NEM	National Electricity Market
NETT	National Emissions Trading Taskforce
NGO	Non-government organisation
NFEE	National Framework on Energy Efficiency
PC	Productivity Commission
PJ	Petajoule
PM&C	Department of the Prime Minister and Cabinet
PV	Photovoltaic
PVRP	Photovoltaic Rebate Program
R&D	Research, development and demonstration
REII	Renewable Energy Integration Initiative
RET	Renewable Energy Target
RDC	Rural Research and Development Corporation
RRPGP	Renewable Remote Power Generation Program
SME	Small and medium size enterprise
TGET	Task Group on Emissions Trading
UNFCCC	United Nations Framework Convention on Climate Change

APPENDIX 6: BIBLIOGRAPHY

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