

12. Policy options and strategies

This chapter first sets out some axioms and broad principles and then proposes specific greenhouse response policies and strategies for all levels of government, business and other stakeholders in order to achieve our principal scenarios for 2040.

12.1. Axioms and principles

1. The human-induced greenhouse effect is real; its main cause is the combustion of fossil fuels; its result is global climate change which is already occurring; and it requires urgent, substantial, international, national and local action.
2. The main drivers of increasing combustion of fossil fuels are economic growth, the widespread use of inappropriate technologies and population growth.
3. The goal, core objectives and Precautionary Principle of ecologically sustainable development should be applied to this situation. Those accepted by the Australian Government (1992) are:

Goal:

Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

Core Objectives:

- To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations.
- To provide for equity within and between generations.
- To protect biological diversity and maintain essential ecological processes and life support systems.

One of the key Guiding Principles, ***the Precautionary Principle***, is:

Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

4. Following modelling by the IPCC, global greenhouse gas emissions will have to be reduced by 60-70% compared with current levels before the end of the 21st century.
5. Taking into account the needs of developing countries, this means that Australia's total greenhouse gas emissions may have to be reduced by at least 80% compared with current levels before the end of the 21st century.
6. The energy sector, as the principle source of Australia's emissions, cannot be sheltered from the implications of this large volume of emissions and therefore its emissions must be reduced by at least 80% compared with current levels before the end of the 21st century.
7. All levels of government, business, trade unions, community-based non-government organizations and individuals must play active roles in this transition.

8. The main barriers to making the transition are neither technical nor economic¹, but rather are social and institutional.² Therefore, the enhanced greenhouse effect cannot be simplistically attributed to perverse individual behaviour. An effective response requires governments to intervene to change the institutional structures and an economic system that fosters energy waste and excessive use of fossil fuels.
9. The environmental and social benefits of the efficient use of energy and the use of renewable sources of energy are large and should be reflected as far as possible in pricing and government funding.
10. Government action in Australia is currently inadequate for achieving a transition to an ecologically sustainable and socially equitable energy system. An adequate response must address all aspects and portfolios.
11. Australia is well placed to gain competitive advantage from building up its industries in efficient energy use and renewable energy. Given nurturing in their early years, these industries can provide substantial exports and import substitution.

The implications of these axioms and principles are that Australia needs visions of clean energy futures and public debate about policies and strategies for implementing them. It also needs firm targets and timescales for reducing greenhouse gas emissions in the energy sector and a wide range of economic social and regulatory instruments to encourage implementation, namely:

- shaping the market for energy services³ in order to remove barriers to efficient energy use, renewable energy and natural gas;
- taxes and user charges;
- regulations and standards;
- organisational structures and processes;
- education, information, training; and
- targeted funding for infrastructure, R, D & D, retooling of manufacturing industry and alleviating energy poverty among low-income earners.

The barriers to efficient energy use, renewable energy and natural gas have been discussed by IPCC (2001b, Chap.5), Watt and Outhred (1999) and Greene and Pears (2003) and references therein. They need not be repeated here. They are implicit in the following specific proposed policies and strategies, which contain both short-term and long-term measures. The numbering is for ease of reference and does not reflect priority. The distinction between policies and strategies is not a sharp one, so we do not attempt to separate them here. There is a great need for both general and specific actions. Section 12.2 recommends policies and strategies that apply to all levels of government

¹ Taking into account the large economic subsidies to the production and use of fossil fuels and the failure so far to include environmental and health costs in the prices of fossil fuels.

² This is not simply an axiom, but is also a finding of IPCC (2001b) and is supported by the results of this and other Australian studies, such as Watt and Outhred (1999), Greene and Pears (2003) and references therein.

³ Rather than for energy generation or use per se.

and would assist cleaner energy technologies in general. Section 12.3 addresses more specific policies and strategies for particular energy technologies and systems.

12.2. Policies for all spheres of government

1. Introduce separate targets for greenhouse gas reductions for Australia, each State and Territory, and each Local Government area. Require each responsible level of government to develop a publicly available strategic plan and action plan of implementation and to report publicly on progress each year.
2. Introduce separate targets for greenhouse gas reductions for the in-house operations of the Australian Government, each State and Territory Government, and each Local Government. Require mandatory annual public reporting of their own energy consumption and GHG emissions by all these governments and their public services.
3. Legislate to require businesses with annual turnover greater than \$10 million to implement Policy 2.
4. Introduce in-house carbon levies to fund emission reduction within government's own operations, and encourage or require adoption of such internal levies by participants in Greenhouse Challenge and other government programs.⁴
5. Introduce minimum energy efficiency and greenhouse standards for the procurement by government of buildings, office and other equipment, appliances and hot water.
6. Substantially increase the Mandatory Renewable Energy Target (MRET) as an industry development measure to build industry capacity and capability. In the longer term this can be dovetailed into an emissions trading scheme as costs of renewable energy fall.
7. Increase funding for R, D & D on efficient energy use and renewable energy technologies, on socio-economic and policy aspects, and on the organisational and institutional changes required for dissemination of the technologies.
8. Foster public education and information about efficient energy use and renewable sources of energy.
9. Modify the National Electricity Code in order to:
 - include constraints on CO₂ emissions that are progressively tightened over the years;
 - recognise the additional economic value of renewable energy sources;
 - ensure that the sale of electricity to the National Electricity Market by natural gas and renewable energy generators is not treated less favourably than from any other energy source or technology.

⁴ Such an approach means that governments and businesses will start to see carbon price signals, but the money will stay within the government programs and businesses and can be used to fund actions that reduce emissions and in many cases repay rapidly the initial investments.

10. Support the promotion of Australian technology and expertise internationally through the establishment of a specific export development fund to promote Australia as a provider of renewable energy technology, goods and services, especially in the Asian and Pacific-rim markets.⁵
11. In all policy contexts recognise the importance of minimising legislative and regulatory uncertainty in order to maintain investment confidence.

12.3. Specific policies to assist specific technologies and systems

For convenience, these recommendations have been organised in technology groups.

Efficient energy use⁶

1. Implement national mandatory energy and greenhouse labelling for all appliances and equipment with the capacity to use more than 50 watt of electricity or 5 MJ/hour of natural gas.
2. Implement national mandatory minimum energy and greenhouse performance standards for all appliances and equipment with the capacity to use more than 50 watt of electricity or 5 MJ/hour of natural gas. Make standards increasingly stringent every 5 years, publishing schedules for improvement 3-5 years ahead, so that businesses can plan, and with requirements based on the world's best practice, not just removal of the worst products from the marketplace.
3. Legislate for mandatory energy performance standards for all homes, with new and renovated homes to meet standards forthwith and existing homes to achieve specified standards increasing in 5-year steps. Since NatHERS simulation is only concerned with the building envelope, develop a more comprehensive indicator of factors influenced during construction, such as heater/cooler efficiency and fuel, cooking fuel, hot water system efficiency and fuel, installed lighting density, provision of solar clothes drying facilities (clothesline), etc.⁷
4. For all homes mandate energy and greenhouse gas ratings and require that these ratings be published in all advertisements and contracts for the sale or rental of the homes.⁸
5. For all commercial buildings mandate minimum energy and greenhouse performance standards based on the Australian Building Greenhouse Rating Scheme. Building owners to be given options to comply, including the use of Green Power and Renewable Energy Certificates (RECs) under MRET. The minimum performance standards should initially include a 5-star requirement for

⁵ For some young technologies, such as photovoltaics, the domestic market is still too small to support the industry, and so exports can play a vital role in industry development.

⁶ For more detail see BCSE (2003).

⁷ SEDA's Energy Smart Homes point score system is a step towards such an indicator and NatHERS now includes a statement of star rating for heater, cooler and water heater, but neither integrate the envelope/heater/cooler combination to provide a space conditioning energy estimate.

⁸ As currently practised in the A.C.T.

new buildings including fitout, and a requirement for existing commercial buildings to be progressively improved to achieve 4-star rating.

6. Increase funding for the Cities for Climate Protection (CCP) program for local governments from the present level of \$13M over 5 years to 10 times that level for the next 5 years and maintain that level to 2020 at least. The present funding only provides on average about \$3,500 p.a. per Council. Considering the large number of local governments in Australia and the wide range of ways they could reduce GHG emissions, there would be no problem in spending the enhanced funding effectively. Require each local government to report annually on the use of the funding.
7. Award one-off grants to manufacturers of energy-consuming appliances and equipment, so enable them to retool in order to meet the mandatory energy performance standards.

Biomass energy

8. Change the MRET regulation to actively encourage dedicated tree energy crops for the purpose of growing biomass for fuel on land that has been cleared before 1990.
9. Pay an agreed contribution for the planting of energy (and other) crops grown for the purpose of limiting dryland salinity, erosion and other forms of land degradation.
10. Introduce biomass establishment grants for growing energy crops.
11. Provide specific support for the development of a national bioenergy roadmap for Australia and its implementation.
12. Provide a bioenergy showcase program to demonstrate a full-scale, integrated energy crops/energy conversion project in Australia.
13. Encourage the shift to highly efficient, low emission, biomass-burning stoves and heaters, especially in urban areas. The aim is to phase out polluting open fires and inefficient burners and to encourage the use of highly efficient biomass burners, such as pellet stoves and heaters. An initial step should be to ban open fires and open fireplaces in metropolitan and urban areas.

Wind power

14. With wide public consultation, develop and implement consistent planning guidelines across all levels of government for the establishment of wind farms.
15. Develop grid management policies that allow for the inclusion into Market rules of 24-48 hour wind farm output forecasting data. The use of such data will allow for the greater penetration of wind energy and optimised cost and/or emissions reductions.

16. Extend State and federal incentives for small renewable energy generation systems, such as solar thermal and solar photovoltaic rebates, to include small wind turbines of less than 100 kW capacity that service a similar need and market.

Solar hot water and direct solar electricity

17. Mandate that electric hot water services in mainland Australia be sold packaged with a lifetime Green Power purchasing requirement. The purchase package would have to include the installation of a time-of-day meter in cases where it is not already connected.⁹
18. Mandate that a solar, heat pump or solar compatible natural gas hot water system with low standby losses be installed in every proposal for a new or substantially renovated residential building. Where natural gas and sunshine are both available, mandate that the only system that may be installed be gas boosted solar.
19. Local governments to implement rules protecting solar access of all existing and new buildings.
20. Local governments to remove planning requirements on the installation of solar hot water and photovoltaic modules on residential buildings.¹⁰
21. Because of the huge potential for solar photovoltaic and solar thermal electric systems in Australia, include specific tranches for each of these technologies in the R, D & D funding addressed in Section 12.2.

Electricity generation and retailing

22. Mandate that there will be no new or refurbished base-load or intermediate-load power stations with emission intensities greater than that of the best available combined-cycle natural gas power station. Refurbishment is defined as an investment greater than \$50 million 2003 Australian dollars.¹¹
23. Mandate generator efficiency standards for existing base-load and intermediate-load power stations to ensure that the existing stock of power stations is reducing emissions and improving efficiency.
24. Require electricity retailers to reduce progressively the greenhouse intensity of electricity sold. Retailers must be able to meet these requirements in part by providing programs to reduce their customers' energy use.¹²
25. Establish a target for cogeneration and provide grants on a dollar for dollar basis to assist in funding feasibility studies for specific projects.

⁹ So that consumers can contribute to the additional infrastructure costs of using peak-load electricity.

¹⁰ Currently, different Councils impose different conditions (including no constraints in some areas). Planning requirements generally take weeks to satisfy, and so disadvantage solar compared with electric and gas hot water.

¹¹ Until such time as the market reflects the full economic, environmental and health costs of burning coal, a mandatory constraint on emissions seems to be the only way of cleaning up electricity supply.

¹² This will encourage electricity retailers to become energy service providers rather than suppliers of a commodity.

Transmission and distribution

26. Treat the funding of new electricity transmission and distribution lines for wind power, biomass, other renewables and natural gas and on the same basis as the historic funding of network expansion for centralised power generation from fossil fuels.¹³ Therefore, ‘smear out’ the cost over electricity charges for all consumers¹⁴. The impact may be softened by government capital contributions.
27. Similarly, treat the funding of new additions to the natural gas network on the same basis as the historic funding of network expansion. Therefore, ‘smear out’ the cost over gas charges for all consumers. The impact may be softened by government capital contributions.
28. Require all proposals for new transmission and distribution lines for the purpose of meeting increasing demand to assess the alternative option of reducing demand. This assessment should be adjudicated by State Environment Protection Authorities.¹⁵
29. Mandate that all new electricity connections for residential and business use have a time-of-day meter; that complete replacement of all existing meters with time-of-day meters be implemented over a decade; and that energy retailers must bill customers with these meters according to a published time-of day tariff.¹⁶
30. Revise the National Electricity Code to ensure that distributed generators receive fair network access and pricing, considering location of generators and time of day of generation.¹⁷

Prices and subsidies

31. Remove all subsidies and cross-subsidies from electricity and fuel prices in rural areas, and replace with direct payments of rural allowances.¹⁸
32. When existing State Government contracts with aluminium smelters come up for renewal, require State Governments to remove *de facto* subsidies for electricity

¹³ Transmission lines would never have been built to serve customers beyond the cities without this principle. Furthermore, we take into account the fact that cleaner energy scenarios have lower energy demand than baseline fossil fuel scenarios. This saves money that would otherwise have to be spent on extra generation, transmission and distribution for the latter scenarios. (See Section 10.3 under ‘Clean Energy Scenario 1, 3rd dot point.’)

¹⁴ Since customers benefit from accessing additional generation, whether it is distributed or centralised.

¹⁵ This is to counter a perceived cultural and institutional bias towards increasing supply.

¹⁶ This will encourage efficient energy use by making electricity consumers pay a price for energy consumption during peak periods (e.g. from air conditioning) that better reflects infrastructure costs, and will also encourage the installation of solar electricity by reflecting its economic value better.

¹⁷ Despite the good intentions of those who drafted the Code, it was framed at a time when the grid was (and still is) characterised by large thermal generators clustered in a few locations and joined to the major customer load centers by a few transmission lines. Renewable energy and most natural gas power plants tend to be smaller and less centralized.

¹⁸ This would permit residents of rural areas the option to spend the payments on efficient energy use and renewable energy that are often more cost-effective in rural areas than supply from centralised power stations.

and infrastructure. Use part of the savings to facilitate the creation of new jobs in any region in which a smelter is subsequently closed down.¹⁹

33. Reform the pricing of access to and use of electricity transmission and distribution grids, in order to avoid overcharging small, dispersed generators of electricity that connect to the distribution network alone, or use only a short distance of transmission line.

12.4. Costing the recommendations

At first sight there appear to be many policies and strategies. However, it must be kept in mind that these span all three levels of government, all portfolios and a variety of types of measures that interlock and complement one another. They involve economic instruments, regulations and standards, targeted funding, organisational change, and education.

Only a few of the recommended policies involve significant costs.

- expansion of MRET; we envisage that this would be the largest item, possibly amounting to \$400-\$500 million p.a. until a self-funding carbon tax or tradeable emission permit system is implemented;²⁰
- expansion of Cities for Climate Protection (\$130 million over 5 years);
- expansion of R, D & D (\$30 million p.a.);
- assistance to farmers for limiting dryland salinity and other forms of land degradation by planting biomass for energy crops, which will have to be done anyway (\$50 million p.a.);
- the creation of biomass establishment grants and showcase, and cogeneration grants. (\$5 million p.a. for 5 years.);
- retooling grants to manufacturers. (\$15 million p.a. for 3 years.);
- replacement of existing electricity meters with time-of-day meters over a decade, which will be paid by electricity consumers and merely brings forward an investment that will have to be made anyway (not costed).

These costs initially amount to less than \$630 million p.a. and are all temporary. The first and largest is paid for by electricity consumers and the others by government. They could be funded by reducing some of the perverse subsidies (over \$5 billion p.a.) to the production and use of fossil fuels (see Section 10.3).

¹⁹ This is recommended on the basis that the aluminium industry is a huge greenhouse polluter, employs very few people in relation to the amount of capital invested, and receives large *de facto* subsidies (Turton, 2002), and that Australia is one of only a few countries where aluminium smelting is based substantially on burning coal.

²⁰ MRET is paid for by electricity consumers, rather than government, and corresponds to an increase in electricity price about 0.2 c/kWh. However, a reduction in demand for electricity, resulting from enhanced efficiency of energy use, could maintain electricity bills at the same level as before MRET.