

... we now know that the impacts of our present fossil fuel-based, centralised energy supply systems are unsustainable. We need to rethink the way we supply and use energy: and, since most of our energy use is either in or for cities, they must be a key focus of our attention.

(Planning Institute of Australia)¹

Energy

- 8.1 As cities grow and energy needs escalate, meeting the supply of inner city and industrial areas, and providing the infrastructure to deliver energy to spreading developments becomes increasingly difficult. Inefficient energy usage results in higher energy needs and increased air emissions.
- 8.2 To meet future consumption needs and manage air emissions, the sustainable city must diversify its sources of energy generation and, where possible and appropriate, incorporate renewable energy sources.
- 8.3 A sustainable city would successfully uncouple economic growth from increased energy consumption.
- 8.4 Lower energy consumption rates, greater efficiency and increased use of renewable energy sources have potential benefits for cities in terms of reduced infrastructure costs and air emissions, and more secure long term access to energy sources.
- 8.5 A number of issues related to energy have already been discussed in previous chapters of this report, including energy efficiency building in chapter 7. In this chapter, the committee considers:

1 Planning Institute of Australia, *Submission 168*, p. 26.

- Australian Government initiatives;
- Energy delivery; and
- Energy efficiency and education.

Australian Government Initiatives

National Framework for Energy Efficiency

- 8.6 The Ministerial Council on Energy was established in June 2001 by the COAG. A key task of the Ministerial Council is to identify policies and programmes that will deliver improvements in energy efficiency through coordinated action by federal, state and territory governments.
- 8.7 The purpose of the National Framework for Energy Efficiency (NFEE) is to access the economic potential of energy efficient technologies and processes to achieve a major enhancement of Australia's energy efficiency performance.
- 8.8 The Ministerial Council on Energy has committed to implement, over three years, a package of policy measures comprising Stage One of the NFEE. Ministers also agreed to consider other incentives for energy efficiency that will constitute Stage Two of the NFEE. Stage Two is to be developed in the context of the Productivity Commission inquiry into the economic and environmental potential offered by energy efficiency.
- 8.9 The committee believes that, with the implementation of the recommendations contained within this Chapter and of the NFEE, Australia will be better served in the area of efficient energy use.

Photovoltaic rebate programme

- 8.10 Photovoltaic systems convert sunlight into electricity. Under the Photovoltaic Rebate Programme (PVRP), which commenced on 1 January 2000, cash rebates are available to householders and owners of community use buildings who install grid connected or stand alone photovoltaic systems.

- 8.11 In this year's budget, the Government has committed to provide \$11.4 million over two years to extend the Photovoltaic Rebate Programme.² This measure will involve funding of \$5.7 million in 2005-06 and \$5.7 million in 2006-07. The cost of this measure will be met from existing resources for the Greenhouse Gas Abatement Programme.³
- 8.12 The programme offers incentives in three main areas:
- Supporting residential property developments (up to \$1million will be offered to residential property developers to support the installation of photovoltaic systems);
 - Supporting the use of photovoltaic systems on residential buildings; and
 - Supporting the use of photovoltaic systems on community use buildings such as schools.
- 8.13 The rebate level for new systems is currently \$4 per peak watt, capped at \$4000 (or 1.0 kW) per residential system and \$8000 (2.0 kW) per Community Building system. The rebate level for upgrades to existing systems is \$2.50 per peak watt capped at \$2500 (1.0 kW).
- 8.14 Some submissions to this inquiry suggested that the programme does not have enough funding to keep up with the demand for rebates. Increased rebates and a widening of the programme's coverage to include solar hot water systems were recommended to encourage higher take-up.⁴
- 8.15 It appears from information available that there is a need for increased funding for installation of photovoltaic systems whether for electricity output or water heating.

Recommendation 26

- 8.16 **The committee recommends that the Australian Government double the photovoltaic rebate to further encourage the uptake of photovoltaic systems.**

2 See www.budget.gov.au/2005-06/bp2/html/expense-10.htm

3 See www.budget.gov.au/2005-06/bp2/html/expense-10.htm

4 See Southern Sydney Regional Organisation of Councils, *Submission 150*, p. 6; City of Darebin, *Submission 29*, p. 37; Ms Juanita Higgs, Southern Sydney Regional Organisation of Councils, *Transcript of Evidence*, 27 January 2004, p. 51.

- 8.17 The committee is hopeful that the expansion of the Solar Cities programme, as discussed in chapter 3, will also further address the need for increased funding in this area.

Other programmes

- 8.18 The Government's Mandatory Renewable Energy Target (MRET) commenced on 1 April 2001. The *Renewable Energy (Electricity) Act 2000* requires the generation of 9,500 gigawatt hours of extra renewable electricity per year by 2010, enough power to meet the residential electricity needs of four million people.⁵
- 8.19 The committee notes that a recent independent review of MRET recommended that the target be extended from 9,500 gigawatts by 2010 to 20,000 gigawatts by 2020. The Australian Government believes that the costs involved do not justify this target⁶.
- 8.20 The House of Representatives Standing Committee on Environment and Heritage report *Employment in the Environment Sector: Methods, Measurements and Messages* examined the MRET. The committee found that, although mandated requirements are not always an appropriate driver of sustainability, there is a clear role for MRET in providing growth opportunities for the environmental sector and that the policy should be retained and targets increased.⁷
- 8.21 The report made the following recommendation:
- . . . that the Australian Government:
- Retain the Mandatory Renewable Energy Target;
 - Substantially increase the Mandatory Renewable Energy Target as part of a multifaceted approach to increase market demand for and supply of renewable energy and; and
 - Implement a timely review of the Mandatory Renewable Energy Target for beyond 2010 with a view to furthering the uptake of renewable energy on Australia.⁸

5 See www.greenhouse.gov.au/markets/mret/index.html

6 See Department of Prime Minister and Cabinet, *Securing Australia's Energy Future*, 2004, p. 148; see www.dpmpc.gov.au/publications/energy_future/docs/energy.pdf

7 House of Representatives Standing Committee on Environment and Heritage, *Employment in the Environment Sector. Methods, Measurements and Messages*, Parliament of the Commonwealth of Australia, Canberra, November 2003, p. 128.

8 House of Representatives Standing Committee on Environment and Heritage, *Employment in the Environment Sector. Methods, Measurements and Messages*, Parliament of the Commonwealth of Australia, Canberra, November 2003, p. 128.

- 8.22 The Australian Government is implementing the following policy initiatives in support of renewable energy, and as strategies to reduce Australia's greenhouse gas emissions:
- the Renewable Remote Power Generation Programme, which supports renewable energy in remote areas;
 - the Renewable Energy Equity Fund, which provides venture capital for small innovative renewable energy companies;
 - the Low Emissions Technology Demonstration Fund to accelerate the demonstration of new low emission technologies to achieve significant greenhouse abatement; and
 - the Alternative Fuels Programme, which aims to use alternative fuels to reduce greenhouse gas emissions from road transport.
- 8.23 The committee also notes the Energy Efficiency Assessment and the Renewable Energy Development Initiative programmes, which are to be administered by the Department of Industry, Tourism and Resources.⁹
- 8.24 The committee suggests that these programmes and activities be monitored closely for their effectiveness, and that outcomes be communicated comprehensively to industry and the public. The committee envisages that monitoring, reporting and communicating outcomes would be the responsibility of the Australian Sustainability Commission.

Recommendation 27

- 8.25 **The committee recommends that the Australian Government further develop its commitment to energy sustainability, particularly in the area of increasing the use of renewable energy.**

9 See *Environment Budget Overview 2005-06* at www.deh.gov.au/about/budget/2005/ebo/chapter3.html#opportunities

Energy delivery

8.26 The PIA suggests that the old centralised forms of energy supply systems must be re-thought:

While our large, hierarchical energy supply systems have made sense over the past 60 years, as society has developed rapidly using crude and inefficient technologies (which use energy very wastefully), we now know that the impacts of our present fossil fuel-based, centralised energy supply systems are unsustainable. We need to rethink the way we supply and use energy: and, since most of our energy use is either in or for cities, they must be a key focus of our attention.¹⁰

8.27 The committee was advised that decentralised generation and distribution of energy may be a way of increasing efficient energy use. Further, decentralised energy generation and distribution is most suitable for renewable energy sources. According to Origin Energy:

Renewable energy delivery is most effective at the single dwelling level. This has many advantages:

- It can drive the cost of renewable technologies down faster because the higher volume of unit sales will increasingly turn pv modules into accessible appliances, available from a wide range of suppliers.
- It improves the user's understanding of energy - which in turn can lead to behavioural change as consumers become more responsible (less wasteful) with energy use as they attempt to balance energy consumption with generation from their system.
- It increases the number of generators - reducing the risk of system outages.
- The generators are spread across the city (eg solar systems on every roof) eliminating the need for large, cumbersome and real-estate intensive generators.
- Provides local employment.¹¹

8.28 The City of Melbourne also favours a decentralised local model because 'there is no doubt that transmission losses can be minimised by localising generation plants.'¹²

10 Planning Institute of Australia, *Submission 168*, p. 26.

11 Origin Energy, *Submission 143*, pp. 5-6.

12 City of Melbourne, *Submission 109*, p. 7.

8.29 On the other hand, the Western Australian Sustainable Energy Office questions the benefit of decentralisation:

In terms of the need to facilitate a shift away from large-scale, centralised energy generation plant and a reliance on transmission and distribution infrastructure to supply the energy produced to end users, and towards an alternative model consisting of smaller and more distributed energy generation, there is a need to ask whether the environmental, economic and social benefits of such a shift would outweigh the costs of making that transition.¹³

8.30 The committee was not presented with any hard data outlining potential costs versus long term savings of decentralised models, and was advised that this may be a result of a reluctance to invest in this area.¹⁴

Recommendation 28

8.31 **The committee recommends that the Australian Government, through the National Framework for Energy Efficiency, examine the economic and environmental benefits of decentralised energy delivery and encourage investment in this area.**

Heating, cooling, lighting and insulation

8.32 The heating, cooling, lighting and insulation of buildings can considerably increase or decrease the energy consumption of that building.¹⁵

8.33 Currently in Australia, heating and cooling account for 39 per cent of the total residential energy consumption and 15 per cent of residential sector greenhouse gas emissions.¹⁶ This can be reduced by good building design (as considered in chapter 7) and appropriate insulation.

13 Western Australian Sustainable Energy Development Office, *Submission 89*, p. 3.

14 Mr Justin Sherrard, Environment Business Australia, *Transcript of Evidence*, 29 April 2005, p. 63.

15 Mr David Parken, Royal Australian Institute of Architects, *Transcript of Evidence*, 29 April 2005, pp. 50-1.

16 CSIRO, *Submission 91*, p. 12.

- 8.34 Professor Nicholas Low explains the value of good insulation, advocating an ‘overcoat’ of insulation of roofs, walls and floors, as well as triple-glazing. The principles adopted in Europe apply in reverse in Australian cities, because:

What works to keep warmth in also works to keep excessive afternoon heat out.¹⁷

- 8.35 The committee is confident that observations contained within chapter 7 relating to nationally consistent ratings tools will incorporate issues relating to insulation.

- 8.36 The use of lighting also adds to the energy use of a particular dwelling. According to the Royal Australian Institute of Architects:

Regulation of energy consumption in commercial buildings will accelerate adoption of energy saving lighting systems and use of movement sensors to switch off lighting areas not in use. In the residential sector, widespread adoption of compact florescent globes should be a priority.¹⁸

- 8.37 Street lighting has an impact on a wide variety of areas and the impact on energy use is enormous and costly:

It has been estimated that one third of all US light is wasted at a total cost of about 30 million barrels of oil valued at about \$US 2 billion per annum.¹⁹

- 8.38 The committee notes that several local councils are moving to renewable energy sources for lighting, with some areas introducing more efficient types of street lighting and purchasing Green Power. For example, the City of Darebin currently purchases 20 per cent Green Power for street lighting and intends to increase this to 30 per cent next year.²⁰

- 8.39 The committee is aware that the resources of local councils are stretched and it can be difficult to research alternative energy technologies or appropriate sustainable designs. The Department of Environment and Heritage could, as part of their website, include case studies on local councils’ sustainability initiatives. This would provide clear information and incentives for other local councils (and industry) to access. The committee suggests that this may supplement the excellent information provided in the *Your Home Guide* referred to in chapter 7.

17 Professor Nicholas Low, *Submission 74*, pp. 7-8.

18 Royal Australian Institute of Architects, *Submission 159*, p. 12.

19 Dr Bill Hampel and Ms Mary Rimington, *Submission 123*, p. 6.

20 City of Darebin, *Submission 29*, p. 25.

Energy efficiency and education

- 8.40 Australians must not only use less energy; the energy they use must be used efficiently. The Electricity Supply Association of Australia explains:

Effective energy use relates to using the most "sustainable" energy source for the "right" energy service. *Energy efficiency* relates to using the energy source as efficiently as possible for the required energy service. In moving towards more sustainable cities, issues related to energy supply, energy effectiveness and energy efficiency may need to be addressed in a more integrated manner.²¹

- 8.41 However, the PIA drew to the attention of the committee that markets are 'heavily stacked against energy efficiency', particularly because there are 'highly resourced marketing groups working for energy suppliers whose job it is to steal market share from their competitors'.²² Further:

... for energy suppliers, there is much more profit at the margin from selling one extra unit of energy than from saving it, because a large proportion of their costs are sunk capital, which they have to pay for whether it is used or not.²³

Appliances

- 8.42 Household appliances are one place where there is a particular bias against energy efficiency, because salespeople have a vested interest in selling bigger, less efficient models. This applies even to houses.²⁴
- 8.43 The committee considers it unfortunate that energy efficiency is often associated with higher upfront purchase costs. Although consumers may take efficiency ratings into account when purchasing appliances, it is difficult to translate these star ratings into an understanding of the difference in ongoing operating costs.
- 8.44 Dr Lorraine Stephenson informed the committee of Origin Energy's social hardship program, which involves 'home auditing' that:
- ... allows those that are most disadvantaged to reduce their bills—so they are very attuned to what it is costing them—and then to provide [high-efficiency] appliances or other options.²⁵

21 Electricity Supply Association of Australia, *Submission 13*, pp. 2-3.

22 Planning Institute of Australia, *Submission 168*, p. 35.

23 Planning Institute of Australia, *Submission 168*, p. 35.

24 Planning Institute of Australia, *Submission 168*, p. 35.

25 Dr Lorraine Stephenson, Origin Energy, *Transcript of Evidence*, 8 June 2004, p. 57.

- 8.45 The Ministerial Council on Energy is responsible for the National Appliance and Equipment Energy Efficiency Programme (NAEEEP), which involves implementing voluntary and regulatory programmes to improve the energy efficiency of domestic appliances and industrial and commercial equipment. The programme has been demonstrated to be one of the most cost-effective ways to improve energy efficiency, enhance our international competitiveness and reduce greenhouse gas emissions.²⁶
- 8.46 The committee strongly endorses the work being carried out by the Ministerial Council on Energy in the area of appliances. However, consumer awareness and choice are also key factors in changing market demand. The committee suggests that the Department of Environment and Heritage provide on its website, and perhaps also in brochure form, information on the different operating costs of appliances.

Renewable energy technologies

- 8.47 The committee supports the use of pilot projects such as Solar Cities and anticipates the expansion of this programme to include metropolitan areas in other cities, but notes that funding is a major impediment to the development of renewable energy technologies.²⁷
- 8.48 The committee is pleased to note that the Australian Government, under the Renewable Energy Development Initiative, has provided \$100 million over seven years to support strategically important renewable energy initiatives with strong commercial potential, and emissions-reduction potential. This initiative will provide grants to firms for the development and commercialisation of new products, processes and services in the following renewable energy technology sectors: wind, solar photovoltaics, solar thermal, biomass, geothermal energy, wave/ocean energy, hydro and related enabling technologies.²⁸

26 See www.industry.gov.au

27 Centre for Sustainable Energy, *Submission 5*, p. 2.

28 See *Environment Budget Overview 2005-06* at www.deh.gov.au/about/budget/2005/ebo/chapter3.html#needs

CASE STUDY: EASTERN CREEK UR-3R FACILITY

ENERGY FROM WASTE

The Eastern Creek Urban Resource – Reduction, Recovery & Recycling (UR-3R) Facility uses cutting edge technology to recover thousands of tonnes of reusable materials placed in general garbage.

The public private partnership between Waste Service NSW and Global Renewables will divert more than 80 per cent of household waste from landfill using a Greenpeace UK endorsed Mechanical Biological Treatment.

The Creek UR-3R Facility's groundbreaking separation process will recover an extra 23,000 tonnes of plastic, paper and metal recyclable materials each year.

After household waste is sorted, the part that is rich in organics - such as food and garden waste - is separated out and sent to the ISKA® Percolator.

This ISKA® Percolation works a little like a coffee percolator to transform the organic waste into a consistent quality and, while at it, also:

- reduces its odour;
- condenses it;
- recovers energy; and
- rids the organic waste of contaminants.

Warm recycled water is sprayed over the material in the ISKA® Percolator which separates contaminants and rapidly breaks down the organic material before it is discharged as a cleaned solid product suitable for the composting process.

The liquid product from the percolation process is also recovered and digested to make biogas before being re-used on-site. The biogas is used to generate electrical power for the facility, with power exported to the grid as 'green energy'.

The composting is driven by trillions of microscopic garbage eating bugs that munch over an eight to twelve week period until the resulting mulch can be used for quality compost.

The Creek UR-3R Facility is completely self-sufficient in energy and water.

By using liquid captured on-site it takes none of Sydney's water resources. It generates enough green energy to meet its own needs and feeds the rest back into the power grid.

- 8.49 The Centre for Sustainable Energy Systems pointed to Sliver Cell Technology and the Combined Heat and Power Solar System as two renewable energy technologies that have benefited from previous Government support.²⁹
- 8.50 The committee also received evidence on other forms of renewable energy. For example, the Renewable Energy Generators of Australia noted that:
- Hydro-electricity is a major renewable energy resource that can play an increasingly important role in enabling cities around the world to meet sustainability objectives. As a high quality, reliable and flexible energy source it has a pivotal role in integrated energy systems.³⁰
- 8.51 In 1999, Ventura Bus Lines Pty Ltd introduced two buses that operated on ethanol:
- We see *Ethanol* as a sustainable alternative to Diesel powered buses. The emission from one ethanol bus is half that of a diesel bus. *Ethanol* has the potential to be great for Australia economically as we can produce a totally renewable fuel locally that is in no way linked to rising world oil prices.³¹
- 8.52 The committee was advised that Australia is mainly powered by coal, and our lack of diversification exposes Australia. Accordingly, there is an added imperative to adopt renewable energy technologies for diversification purposes.³²
- 8.53 The committee was interested to learn that disaster management is one of the additional benefits renewable energy may provide. As Lend Lease points out, sustainable technologies (primarily renewable energy systems) provide excellent short-term replacement to lost infrastructure and ‘therefore should be fostered as part of disaster response’.³³
- 8.54 The committee notes that the public needs to be made aware of the benefits of renewable energy technology. Origin Energy points out that energy, electricity, is not fully appreciated because ‘it is inexpensive, invisible, and readily available at the flick of a switch’ and suggests that:
- Energy awareness is therefore a vital pre-requisite for a change to renewable energy to occur. This awareness can be provided by

29 Centre for Sustainable Energy, *Submission 5*, p. 4.

30 Renewable Energy Generators of Australia, *Submission 116*, p. 4.

31 Ventura Bus Lines Pty Ltd, *Submission 9*, p. 2; author’s emphasis.

32 Dr Martin Poole, Warren Centre for Advanced Engineering, *Transcript of Evidence*, 29 April 2005, p. 66.

33 Lend Lease, *Submission 71*, p. 40.

initiatives including introducing energy into school curricula and rewarding best practice.³⁴

- 8.55 One way to inform consumers of renewable energy benefits is electricity labelling. This gives them 'more power to make choices in the electricity market by making them aware of the greenhouse impact of their energy purchasing decisions'.³⁵
- 8.56 The committee endorses the following recommendation made by House of Representatives Standing Committee on Environment and Heritage report *Employment in the Environment Sector: Methods, Measurements and Messages*:
... that the Australian Government through the Mandatory Renewable Energy Target pursues the mandatory disclosure for all electricity retailers of:
- Relative sources of supplied energy;
 - Associated greenhouse gas emissions; and
 - Advice on how consumers can increase their purchase of Green Power.³⁶
- 8.57 The committee did not receive any submissions advocating the use of nuclear power. However, the committee notes that there is some base of support for 'reopening the nuclear debate' – nuclear power may be an option for a clean and sustainable power supply.³⁷
- 8.58 Solar power is the most widely recognised form of renewable energy. It is an energy system that can result in significant savings for Australian communities. As STEP Inc. states:
... if each of the 1.8 to 2 million homes in Sydney installed a 1kilowatt solar power system on its roof, we would defer the need to build a new power station for 50 to 80 years.³⁸
- 8.59 As well as increasing the use of renewable energy, Dr Lorraine Stephenson explained to the committee that use of solar power increases the public's awareness of their energy needs and costs of energy use:
We hear from many customers that once they have a solar PV system they inherently become attuned to their energy needs. They actually understand the flows, the total energy use of the

34 Origin Energy, *Submission 143*, p. 4.

35 RoundTable Renewable and Sustainable Energy, *Submission 117*, p. 11.

36 House of Representatives Standing Committee on Environment and Heritage, *Employment in the Environment Sector: Methods, Measurements and Messages*, Parliament of the Commonwealth of Australia, Canberra, November 2003, p. 138.

37 Mr Hugh Ralston, Warren Centre for Advanced Engineering, *Transcript of Evidence*, 29 April 2005, p. 68.

38 STEP Inc., *Submission 87*, p. 8.

household and leakage of energy, and they are frustrated by that because they are not optimising their own financial situation as much as anything else.³⁹

8.60 As with energy efficient appliances, Dr Stephenson explains how the public is unaware of the long term benefits of solar energy and remains focused on the up front cost, rather than the very low ongoing operating costs:

If you had a well-designed residential development that has solar PV or solar hot water and it was solar passive in terms of its design, you would actually have a very low ongoing energy bill. That can then be an incentive for the up-front capital because you will find financial services that are offering good loans for eco-houses, which could be quite beneficial.⁴⁰

8.61 In 2003, Germany enacted a law forcing utility companies to pay higher rates to commercial and residential premises that generate solar (or wind) energy and feed it back to the grid. With this source of guaranteed revenue, solar panel installation have become commonplace in Germany. The law forces utility companies to buy all wind and solar power generated by all users at a price 10 times higher than the rate that users are charged for the electricity provided by the utilities from other forms of power.⁴¹ Higher tariff rates were introduced in 2004, further driving demand by providing attractive investment returns. Germany now leads the world in solar PV power and a number of other countries are in the process of implementing the German model.⁴²

8.62 BP Solar told the committee that, last year, Germany installed 320 MWp of PV power as opposed to Australia's 7 MWp installed in 2004. Government policy has been instrumental in the increased use of solar power.⁴³

8.63 The committee was impressed with the German approach to public policy in this area and sees a significant opportunity for the Australian Government to increase the use of PV generated energy.

39 Dr Lorraine Stephenson, Origin Energy, *Transcript of Evidence*, 8 June 2004, p. 57.

40 Dr Lorraine Stephenson, Origin Energy, *Transcript of Evidence*, 8 June 2004, p. 57.

41 Mr Robert Collier, 'Germany shines a beam on the future of energy', *Energy Bulletin*, 21 December 2004, see www.energybulletin.net/print.php?id=3696

42 Private briefing by BP Solar, 26 May 2005. Countries implementing the German model are France, Spain and Portugal, and the model is being considered by Italy and California.

43 Private briefing by BP Solar, 26 May 2005.

- 8.64 The committee also noted the US's Million Solar Roofs Initiative. Launched by President Clinton in 1997, the objective is to facilitate the sale and installation of one million 'solar roofs' by 2010. The US Department of Energy describes the initiative as practical and market-driven approach - 'a unique public-private partnership, aimed at overcoming barriers to market entry for selected solar technologies'.⁴⁴

Recommendation 29

- 8.65 **The committee recommends the Australian Government investigate US and German initiatives in the area of solar energy generation and purchase, and, where appropriate, implement or emulate them.**

Energy pricing

- 8.66 Origin Energy points out that the pricing of different energy sources is not always level and may work against renewable energy sources, such as solar energy:

The current price of solar is high compared with grid power in Australia, however large-scale grid power rarely represents the true cost of delivered electricity. Large power stations in Australia are mostly coal-fired and the price of the electricity produced does not include the externality costs of:

- Greenhouse emissions and
- Pollution in the form of air pollution and waste material from scrubbers

Including the full costs of electricity generated and delivered to consumers would substantially improve the economics of distributed renewable generation including solar photovoltaics, small scale wind, and run-of-the-river micro-hydro as renewable generation avoids these externalities. Of these, only solar photovoltaics can be used in all Australian geographic regions to power most homes.⁴⁵

44 See www.millionsolarroofs.org

45 Origin Energy, *Submission 143*, p. 3.

- 8.67 The Australian Conservation Foundation and Environment Victoria also make the point that electricity prices in Australia are some of the lowest in the OECD and that this pricing does not take into account the environmental and health costs of burning fossil fuels.⁴⁶
- 8.68 However, the committee is pleased to note that the gap in price between renewable and coal generated electricity appears to be narrowing somewhat, with cost reductions that have been passed on to consumers.⁴⁷
- 8.69 The Australian Business Council for Sustainable Energy also points to the disconnect between what consumers pay for energy and its actual cost. For instance, people do not receive price signals for their use of power at peak times. Peak power needs determine the total required network and generation capacity. The negligible peak price signal means that customers typically pay less than 5 per cent of the true cost of supplying the peak power in summer.⁴⁸
- 8.70 Mr Ric Brazzale gave the installation of air conditioners as one example of peak power costs that do not flow through to the consumer:
- . . . customers that install airconditioners impose a significant cost on the electricity system but do not pay for it because they only pay an average price. They do not pay for the peak power they use and they do not pay for the peak network infrastructure that they use to deliver that power.⁴⁹
- 8.71 The committee is pleased to note the development of smart meters which show users how much power they consume and what that power costs in real time. This allows consumers to choose to operate appliances at non-peak periods and save. In NSW, Country Energy conducted a trial of smart meters in 200 homes in the Queanbeyan area.

46 Australian Conservation Foundation and Environment Victoria, *Submission 162*, p. 10.

47 Dr Lorraine Stephenson, Origin Energy, *Transcript of Evidence*, 8 June 2004, p. 51.

48 Australian Business Council for Sustainable Energy, *Submission 134*, p. 6.

49 Mr Ric Brazzale, Australian Business Council for Sustainable Energy, *Transcript of Evidence*, 16 March 2004, p. 48.