

Chapter 5

Complementary measures

5.1 This chapter considers evidence given by witnesses regarding complementary measures for reducing carbon emissions.

5.2 The complementary measures presented to the committee can be divided into three broad categories:

- (i) proposals to reduce emissions by changing the types of activity occurring in the economy;
- (ii) proposals to use technologies which emit less carbon pollution; and
- (iii) capturing and sequestering those emissions which continue to occur.

Effective action to mitigate climate change will likely consist of a mixture of these approaches.

5.3 Evidence was given to the Committee that actions to shift to less carbon intensive activity in the economy may include:

- (a) introducing a market based instrument (such as the CPRS); and
- (b) specific regulation in certain areas, such as in the area of energy efficiency or demand management. These are discussed further below.

5.4 The committee received considerable evidence on the need to promote renewable energy sources. Evidence was received from witness:

- (a) Calling for greater government intervention to improve the viability of these renewable technologies (although some witnesses gave evidence that these technologies may not be economically viable);
- (b) Advocating the use of less polluting industrial processes; and
- (c) Identifying technologies that have the have the potential to capture emissions after they have occurred.

5.5 In relation to the various complementary measures canvassed in evidence before the committee, some of these approaches are already in operation; other new technologies present exciting opportunities. In some cases, technologies and techniques proposed to the committee may never be commercially viable.

5.6 The approaches discussed in this chapter are often described as 'complementary' measures. As the term suggests, these types of measures are often described as being 'complementary' to something else – typically a market based instrument.

5.7 Mr Phillip Sutton, of the Climate Emergency Network, gave evidence to the committee of the need for complementary measures in addressing climate change:

...the price only has its effect through an interaction with responsiveness of the economy. It is the complementary measures that make the economy responsive. If you do not have very strong complementary measures then you need a much higher price in the market to get any response. It is quite reasonable to think that, in fact, if you favoured the complementary measures in the very short term, created the infrastructure and provided the investment that would have a more stimulatory effect than if you simply relied on a very long-term and volatile price system coming out of a permit trading system.¹

Impact of a cap and trade approach

5.8 The extent of the adoption of any complementary measures to reduce carbon emissions will be affected by the emissions cap, if any, adopted by the government.²

5.9 As discussed in Chapter 3 of the report, a cap and trade model operates by setting a national cap on emissions and then allocating permits to emit up to that cap level. The cap is mandatory. Emissions are not permitted beyond the cap other than as a result of a 'safety valve' mechanism, 'banking' of emissions between years, or activities in sectors not covered by the scheme.

5.10 The Productivity Commission, in their submission to the committee, stated 'under a 'pure' ETS with a binding quota, the quantum of emissions is fixed. In this case, other abatement policies aimed at sectors covered by the ETS could change the composition of emissions reductions but not total emissions.'³ In other words, additional actions can only change the composition of the emissions mix, or influence the cost of abatement (including easing costs for particular parts of the community), or achieve other policy goals, such as industry development.

5.11 The Productivity Commission gave the following example to illustrate this design feature of an ETS:

Mandating energy efficient light bulbs, for example, could achieve greater abatement from less energy use, but there would be an equivalent decrease in abatement elsewhere. This is because the energy efficiency policy reduces emissions and thereby displaces other abatement that would have occurred in order to meet the ETS target, reducing the demand for permits such that their price falls. As it is unlikely that all firms and households would install energy-efficient light bulbs under an ETS, the policy induced abatement occurs in place of other abatement that would have occurred with

1 Mr Phillip Sutton, Climate Emergency Network, *Proof Committee Hansard*, 20 May 2009, p. 38.

2 Productivity Commission, *Submission 24 Attachment A*, p. xiv.

3 This aspect of the CPRS has been the subject of considerable criticism; see Chapter 4.

a higher permit price. The composition of abatement changes, not the amount.⁴

5.12 Evidence was given to the committee that complementary measures can still play an important role in conjunction with a cap and trade model. This chapter provides examples of this evidence.

Criteria for selecting complementary measures

5.13 If there is general agreement that the CPRS, or other price signal, will not be effective without the use of additional measures, the question arises of how these complementary measures should be selected.

5.14 The Australian Industry Group in their submission to the committee put forward the following criteria for selecting which measures should complement a CPRS:

If emissions reduction under a complementary measure can be achieved at a price lower than the permit price, these additional emissions reductions will tend to lower the overall burden on the economy of greenhouse gas reduction.

If, on the other hand, the per unit emissions reductions that would be achieved under a complementary measure would cost more than the permit price, adopting the measure would increase the overall burden on the economy of greenhouse gas emissions.⁵

5.15 Similar concerns about the cost of such measures were expressed by the Productivity Commission in their submission to the committee:

all supplementary policies must be subject to rigorous evidence-based analysis to determine if their rationales are sound and, if so, whether intervention would deliver a net community benefit after consideration of the costs of action.⁶

5.16 Dr Karl Mallon of Climate Risk Pty Ltd put forward an alternative view in his evidence to the committee:

...the CPRS cannot be seen alone. The nature of the CPRS, which is, if you like, a price based mechanism, means that it brings through the least-cost solutions first. What that means is that under the CPRS we may see things like energy efficiency or some of the low-cost opportunities being strongly promoted but some of the more expensive but fundamentally important resources like geothermal and solar energy would be sitting on the shelf...But the complementary measures, especially in the energy efficiency sector and the renewable energy target, are fundamentally essential to the

4 Productivity Commission, *Submission 24 Attachment A*, p. xiv.

5 Australian Industry Group, *Submission 605*, p. 4.

6 Productivity Commission, *Submission 24 Attachment A*, p. x.

functioning of the CPRS and the overall objective of the emissions outcomes that are intended.⁷

5.17 The *White Paper* notes that the Council of Australian Governments (COAG) 'have agreed a set of principles for jurisdictions to review and streamline their existing climate change emission reduction measures, with the aim of achieving a coherent and streamlined set of climate change measures in 2009'.⁸ The *White Paper* sets out these principles as follows:

1. The measures are targeted at a market failure that is not expected to be adequately addressed by the Scheme or that impinges on its effectiveness in driving emissions reductions. For example, research and development failures, common use infrastructure issues, information failures and excess market power.
2. Complementary measures should adhere to the principles of efficiency, effectiveness, equity and administrative simplicity and be kept under review. They may include:
 - a) measures targeted at a market failure in a sector that is not covered by the Scheme
 - b) measures for where the price signals provided by the Scheme are insufficient to overcome other market failures that prevent the take-up of otherwise cost-effective abatement measures
 - c) measures targeted at sectors of the economy where price signals may not be as significant a driver of decision making (e.g. land use and planning)
 - d) Some measures in (a) or (b) may only need to be transitional depending on expected changes in coverage or movements in the carbon price.
3. Complementary measures should be tightly targeted to the market failures identified in the above criteria that are amenable to government intervention. Where the measures are regulatory they should meet best practice regulatory principles, including that the benefits of any government intervention should outweigh the costs.
4. Complementary measures may also be targeted to manage the impacts of the Scheme on particular sectors of the economy (for example to address equity or regional development concerns). Where this is the case, in line with regulatory best practice, the non-abatement objective should be clearly identified and it should be established that the measure is the best method of attaining the objective.
5. Where measures meet the above criteria, they should generally be implemented by the level of government that is best able to deliver the measure. In determining this, consideration should be given to which

7 Dr Karl Mallon, Climate Risk Pty Ltd, *Proof Committee Hansard*, 20 May 2009, p. 29.

8 *White Paper*, p. 19-1.

level of government has responsibility, as defined by the Constitution or convention/ practice; the regulatory and compliance costs that will be imposed on the community; and how the delivery of the measure is best coordinated or managed across jurisdictions.⁹

Committee view

5.18 The committee concurs with the view expressed by the Government in the *White Paper* that complementary measures 'will be required to work in parallel with the scheme'.¹⁰

5.19 However, the committee notes that the work through COAG on the streamlining of existing measures in place at Commonwealth, state and territory level on climate change is still underway. This is concerning given views expressed by industry about the regulatory burden imposed by contradictory and duplicative measures.¹¹

5.20 Ideally, the design of complementary measures should take place after the primary mechanism (whether the CPRS or some other system) has been chosen and designed to fill any gaps or weaknesses left by the primary mechanism. However, in practice there is already a large number of existing programmes in place at Commonwealth, state and territory level.

5.21 There is a real risk that all levels of government will continue to introduce complementary measures in an ad hoc manner, and will not rescind existing ones which are no longer required. This is less desirable than developing measures developed in compliance with best practice policy making principles and as part of a coherent national framework. The recent decision of the government in relation to home insulation as part of the February 2009 economic stimulus package could be an example in this regard.

5.22 The Government's *Climate Change Budget Overview 2009-10* outlines \$10.3 billion in funding for various projects in 2008-09, and a further \$4.8 billion in the 2009-10 Budget, including support for energy efficiency, renewable energy, carbon capture and storage, assistance for households and industry, and development of future programmes.¹² Many of these programmes are, no doubt, worthwhile in themselves. It is not clear to the committee, however, the extent to which these programmes meet the criteria for selection of complementary measures provided by the Government in the *White Paper*.

9 *White Paper*, p. 19-2.

10 *White Paper*, p. 19-3.

11 See examples of industry views on contradictory and burdensome effect of existing regulation in Chapter 3.

12 Department of Climate Change, *Climate Change Budget Overview 2009-10*, May 2009, p. 3.

5.23 Despite the government's stated view that the continued existence of certain state based schemes 'would result in an increased compliance burden on business and increased costs to the economy',¹³ agreements between the Commonwealth and states to reduce regulatory burden can be slow to implement. The experience of the introduction of the goods and services tax and implementation of the corresponding agreement on the elimination of stamp duty is an example in this regard.

5.24 The committee is concerned that passage of the CPRS legislation prior to finalisation of a concrete agreement by COAG on complementary measures (including reduction of redundant programmes) could lead to imposition of new burdens on industry without compensating reductions of the regulatory burden. This would achieve little benefit in terms of mitigation of emissions.

5.25 State and territory governments may not agree to termination of their programmes until the Commonwealth's approach is in place. However, the preference of the committee is that the best way to ensure that complementary measures will 'work in parallel' with the scheme is to ensure they are *agreed* in parallel, rather than in isolation from each other.

5.26 The committee questions the rush to pass legislation when such critical issues have not been resolved. This reinforces the committee's Recommendation 2.

Reducing demand for energy

5.27 Aside from the provision of a price signal on carbon (which has been discussed at length elsewhere in Chapter 3), the committee received evidence from witnesses encouraging a reduction in demand for energy by promoting energy efficiency in industry and transport.

Energy Efficiency

5.28 The committee notes that a number of government programmes encouraging energy efficiency at Commonwealth, state and territory level are already in place.

5.29 The committee notes that on 30 April 2009, COAG reaffirmed its commitment to introduce a National Strategy for Energy Efficiency.¹⁴

5.30 Submissions received by the committee pointed to the enhanced role that energy efficiency can play in reducing demand for energy and consequently, reduction of emissions).¹⁵ Submissions focussed in particular on building design, energy

13 *White Paper*, p. 15-3.

14 Council of Australian Governments, Meeting Communiqué, 30 April 2009, http://www.coag.gov.au/coag_meeting_outcomes/2009-04-30/docs/20090430_communique.pdf, viewed 4 May 2009, p. 7.

15 See for example Energy Efficiency Council, *Submission 625*, Green Building Council, *Submission 761*, Australian Institute of Architects, *Submission 420*, Szencorp, *Submission 732*.

standards for businesses and appliances, and use of more efficient techniques by industry.

5.31 The committee heard views that measures of this kind could be implemented in the near term. Mr John Hepburn of Greenpeace stated before the committee:

With direct regulation in terms of energy efficiency there is a lot of opportunity today to set mandatory standards for best practice.¹⁶

Buildings

5.32 The Australian Sustainable Built Environment Council (ASBEC) in its submission to the committee gave evidence that commercial and domestic buildings contribute approximately 23 per cent of Australia's total greenhouse gas emissions.

5.33 ASBEC identified 'untapped potential' for greater energy efficiency, giving evidence that 'measures to stimulate investment energy efficiency in the built environment could save 60Mt of CO₂e per annum, on average, by 2030 – compared with just 8Mt of CO₂e a year under the CPRS alone'.¹⁷

5.34 To achieve these reductions, ASBEC advocated adoption of a national electricity retailer efficiency requirement ('white certificates'), accelerated depreciated for energy efficiency in buildings, and public funding for retrofits.

5.35 ASBEC also noted in their submission the importance of higher building standards and the role of the building code.

5.36 The findings of ASBEC were supported by the Australian Institute of Architects.¹⁸

5.37 Ms Romilly Madew, Chief Executive, Green Building Council, gave evidence to the committee that tighter energy efficiency standards could be mandated in new construction through the building code, and highlighted the potential gains from undertaking energy efficiency in the existing stock of commercial buildings:

...if a 10-year program of upgrading Australia's older commercial office stock to environmental standards were to be undertaken it would create 108,000 construction jobs, with a further 270,000 jobs being created across the broader economy. It would also involve a reduction of greenhouse gas emissions of 140 million tonnes. So the message here is threefold. Firstly, buildings are a key greenhouse gas abatement opportunity; secondly, the CPRS simply will not achieve reductions in the very sector where emissions are significant and potential reductions are most easily achieved,

16 See for example Mr John Hepburn, Greenpeace, *Proof Committee Hansard*, 20 May 2009, p. 38.

17 Australian Sustainable Built Environment Council, *Submission 318*, p. 2.

18 Australian Institute of Architects, *Submission 420*.

meaning a range of other measures to achieve these reductions are required; thirdly, the transition to a green, low-carbon economy is necessary and inherently beneficial in both economic and environmental terms.¹⁹

5.38 Some organisations in their evidence raised concerns about the potential cost of such enhancements to the building code or mandatory energy efficiency programmes.

5.39 In its submission to the Standing Committee on Economics inquiry into the exposure draft of the legislation to implement the Carbon Pollution Reduction Scheme, the Housing Industry Association noted:

...to achieve expected higher energy ratings in new residential dwellings a greater percentage and quantity of building products subject to the CPRS are expected to be used in construction. HIA recommends that greater industry consultation be undertaken to assess the potential impact of complementary environmental measures and their interaction with the CPRS on business activity and the cost of supplying new housing product.²⁰

Vehicles and Appliances

5.40 A number of submissions and witnesses gave evidence proposing greater use of mandatory energy efficiency standards and other incentives to encourage the more efficient use of energy in vehicles and appliances could help to reduce Australia's demand for energy. Some of these are listed in the following paragraphs.

5.41 Mr Frank Topham, Manager, Government Affairs and Media, Caltex Ltd, in his evidence to the committee proposed a number of measures which would be more effective for the road transport sector than the CPRS:

...if you are going to leave motorists and certain other commercial users out of the CPRS, you have to have alternative or complementary measures. We propose a set of measures which would incorporate voluntary targets for carbon efficiency, a feebate scheme which essentially provides cash back for the purchases of high-efficiency vehicles, grants for research and development into low-emission vehicles and low-carbon fuels, and a package of other measures relating to consumer education, public transport, better road management and better urban planning. That package of complementary measures would be far more effective than the totally ineffective CPRS as it relates to motorists and small users.²¹

19 Ms Romilly Madew, Chief Executive, Green Building Council, *Proof Committee Hansard*, 28 April 2009, p. 49.

20 Housing Industry Association, *Submission to Standing Committee on Economics Inquiry into the exposure draft of the legislation to implement the Carbon Pollution Reduction Scheme* (Submission 37), p. 2.

21 Mr Frank Topham, Manager, Government Affairs and Media, Caltex Ltd *Proof Committee Hansard*, 21 April 2009, p. 79.

5.42 Ms Fiona Wain, Chief Executive Officer, Environment Business Australia, in her evidence to the committee described measures that could be taken to encourage the take-up of more fuel efficient vehicles and appliances:

The standards for things like appliances, electrical fittings, automobiles should be put into a package alongside the household retrofit program where there is a national trade-in scheme for appliances. If we are talking about automobiles, if all three levels of government were to mandate that they would buy or lease a certain standard of fuel-efficient vehicles each year that would give the automotive companies a very clear signal about what a basic market is in this country that would then allow them to produce that scale and it would bring down the unit cost for the community.²²

5.43 The committee also received evidence calling for minimum standards to be used to phase out inefficient products. For example, Energetics in its submission to the committee argued that funding from the Climate Change Action Fund should be used to accelerate the development of new Minimum Energy Performance Standards for business equipment.²³

5.44 The committee also received evidence that greater energy efficiency should not be seen as an end in itself. Dr Paul Simshauser, Chief Economist and Group Head, Corporate Affairs, AGL gave evidence to the committee that:

One of the things that are characteristic of households is that, in general, their consumption has tended to increase over time. Our appliances are far more efficient now than they have been historically; the problem is that they tend to be a lot bigger. I am just thinking of my own household. Back when I was a student, I had a rickety old 1950s refrigerator. I now have a five-star fridge but, quite honestly, I could fit most of my family in there. That five-star fridge is obviously consuming a lot more power than that old 1950s fridge. That is fairly symptomatic of society more generally. The floor spaces of our households have jumped from about 135 square metres 20 years ago to, probably, close to 200 square metres, so we have a lot more space heating and space cooling. We obviously have a proliferation of electronic gadgets: hairdryers that look like hand cannons and vacuum cleaners that could just about take the carpet off the ground...the appliances and the consumption levels are much higher than they have ever been. The reality is that power is a very cheap commodity in our society.... Pricing alone, I believe, will not necessarily get us there.²⁴

5.45 Other evidence presented to the committee referred to greater costs associated with mandating higher energy efficiency standards in products. For example, the

22 Ms Fiona Wain, Chief Executive Officer, Environment Business Australia *Proof Committee Hansard*, 15 April 2009, p. 47.

23 Energetics, *Submission 629*, p. 6.

24 Dr Paul Simshauser, Chief Economist and Group Head, Corporate Affairs, AGL *Proof Committee Hansard*, 21 April 2009, p. 8.

Federal Chamber of Automotive Industries in its submission to the committee argued that this approach could impact on the goal of achieving lowest cost abatement:

Such an approach would offend against the major objective of the CPRS, that is, to drive emissions reductions from the cheapest available source. By imposing additional measures on the transport sector, it would suggest that it is worth paying more to abate one tonne of CO₂ from the transport sector than from elsewhere. The rationale for this is not clear.²⁵

Committee comment

5.46 The committee agrees that there are likely to be continued benefits from investment in energy efficiency in the built environment and in motor vehicles. The benefits from such measures may go beyond climate change (for example, energy security).

5.47 The committee cautions that this is an area where governments at all levels may in future be tempted to intervene on an ad hoc basis. It is preferable that investments must be guided by best practice policy making principles. This includes the requirement for a cost-benefit analysis to be undertaken for proposed initiatives. Investment must be made within a coherent policy framework according to transparent criteria for setting priorities.

Sustainable transport

5.48 The committee received submissions relating to the benefits of moving to less polluting forms of transport.

5.49 For example, the Bus Industry Confederation (BIC) in their submission argued:

A percentage of the dollars raised through a CPRS and proposed complementary measures should also focus on Federal Government support for increased public transport investment for both Public Transport infrastructure and planning and for rolling stock in the form of hybrid/electric and gas driven buses on the condition that State governments identify public transport black spots in the system and increase the total number of services and their frequency.²⁶

5.50 The BIC also gave evidence in their submission that:

The BIC believes that the CPRS should exempt permanently high capacity passenger vehicles, public transport and coaches, from any impact that a CPRS will have on fuel prices. The BIC seeks for the CPRS to recognise the positive emissions outcomes delivered by buses and coaches as

25 Federal Chamber of Automotive Industries, *Submission 725*, p. 4.

26 Bus Industry Confederation, *Submission 493*, p. 1.

compared to cars and permanently provide a cent for cent credit against any fuel price impact of the CPRS.²⁷

5.51 Mr Owen Pascoe, Climate Change Campaigner, Australian Conservation Foundation, gave evidence to the committee that:

Investment in public transport through Infrastructure Australia through the budget could potentially reduce more emissions than the solar thermal funding.²⁸

5.52 The Australasian Railway Association (ARA) in their submission to the committee criticised the CPRS as 'favour[ing] road transport over more efficient rail transport'.²⁹ The Australian Rail Track Corporation echoed these concerns.³⁰ The ARA propose a range of complementary measures to promote rail transport, including research and development incentives, increased infrastructure spending, asset depreciation, road congestion charges in metropolitan areas, and a 'Mandatory Rail Use Target' to build on existing targets set by the Victorian and New South Wales governments. The ARA argue that such measures will reduce the emissions growth from road transport, which they project to be seven times higher than other forms of transport between 2010 and 2020.³¹

5.53 Support for increased funding for rail freight was also provided by the Grain Growers Association.³²

Transition to less polluting technologies

Renewable Energy

5.54 The committee received submissions referring to a wide range of possible sources of renewable energy generation. These included solar, hydro, wind, biomass, wave energy, tidal power, geothermal and biofuels. The evidence presented to the committee indicated that these technologies are in varying states of development and commercial readiness. The following section briefly discusses some of these options.

Solar

5.55 The principal existing forms of obtaining direct energy from solar radiation energy are photovoltaic technology and solar heat (thermal).³³

27 Bus Industry Confederation, *Submission 493*, p. 1.

28 Mr Owen Pascoe, Climate Change Campaigner, Australian Conservation Foundation, *Proof Committee Hansard*, 20 May 2009, p. 39.

29 Australasian Railway Association, *Submission 365*, p. 1.

30 Australian Rail Track Corporation, *Submission 413*, p. 6.

31 Australasian Railway Association, *Submission 365*, p.5.

32 Grain Growers Association, *Submission 355*, p. 7.

5.56 Evidence was given by witnesses about the potential of solar energy to meet demand for power.

5.57 Professor Andrew Blakers, Director of the ARC Centre for Solar Energy Systems (Australian National University) stated:

...solar energy is a complete long term sustainable solution. Australia receives 30,000 times more solar energy each year than all fossil fuel use combined. Australia has a significant presence in the worldwide solar energy industry, which can be build upon to create a major export-oriented technology rich industry.³⁴

5.58 Evidence was also given to the committee concerning the potential obstacles preventing the wider take up of solar power, including cost.

5.59 Dr David Brockway, Chief of the Division of Energy Technology at the CSIRO, in his evidence estimated that solar thermal produces power at a cost of approximately \$160 to \$200 per megawatt hour, compared with current wholesale power costs of \$40 per megawatt hour (which do not incorporate a carbon price). This price may come down slightly in time.³⁵ In relation to photovoltaics, Professor Blakers advised the committee:

Photovoltaics will compete at the retail level—that is up against 15c, 20c or 25c a kilowatt hour—within five years in Australia and that is as commercial as anything you would like to find. In the longer term, if we continue to march down the cost curve as we have for the last 30 years, by around 2025 we will be in the \$90 a megawatt hour range, which will be right in there with any other low emission technology.³⁶

Wind

5.60 Wind power is in use by many power generators in Australia, and is one of the more relatively 'technology ready' sources currently in use in Australia.³⁷

5.61 In a 2008 Research Paper by the Parliamentary Library entitled 'the potential for renewable energy to provide baseload power in Australia', it was estimated that Australia's wind capacity was 817 MW. About 2500 GWh is generated annually.³⁸

33 Professor Andrew Blakers, Director of the ARC Centre for Solar Energy Systems (Australian National University) *Submission 271*, p. 4

34 Professor Andrew Blakers, Director of the ARC Centre for Solar Energy Systems (Australian National University) *Submission 271*, p. 2.

35 *Proof Committee Hansard*, p. 101.

36 *Proof Committee Hansard*, 30 April 2009, p. 158.

37 Parliamentary Library, Research Paper, 'The Potential for renewable energy to provide baseload power in Australia', No. 9 of 2008-09, September 2008, p. 13.

38 Parliamentary Library, Research Paper, 'The Potential for renewable energy to provide baseload power in Australia', No. 9 of 2008-09, September 2008, p. 13.

5.62 Dr Brockway in his evidence to the committee referred to the current costs of wind power as \$100 to \$110 per megawatt hour, with support from MRET.³⁹ Mr Andrew Richards, Executive Manager, Government and Corporate Affairs, Pacific Hydro gave evidence to the committee that the costs of wind power were \$80 to \$90 per megawatt hour.⁴⁰

5.63 As wind is a mature technology, Dr Brockway indicated it was unlikely the cost of wind power generation would decline further in future years.

Geothermal

5.64 Ms Jeanes of the Australian Geothermal Energy Group gave evidence to the committee that there are approximately 40 companies with exploration licences looking for geothermal energy around Australia.

5.65 Ms Jeanes cited a report by McLennan Magasanik and Associates which estimated that 2200 megawatts of installed geothermal capacity could be operation in Australia by 2020, and could be the cheapest form of emissions free energy in use by that time.⁴¹

5.66 In terms of cost competitiveness with coal fired power (in the absence of a price on coal), Ms Jeanes gave evidence to the committee that:

The geothermal drilling fund, at the moment, provides project developers who are ready to produce a pilot plant with up to \$7 million of taxpayers' money. The average cost of a pilot plant is about \$25 million, so that is roughly a two-for-one deal. The renewable energy demonstration fund has just received applications and we think that several projects will need about \$50 million to demonstrate that geothermal energy works at scale. The cost of producing energy from a pilot plant is around \$135 a megawatt hour and from a demonstration plant about \$105 a megawatt hour. These are cost estimates for the future obviously, because we have not done them.

We ultimately think we are going to get down to an output cost of about \$80 a megawatt hour. That is competing with a coal price now of about \$45 to \$50 a megawatt hour. We think that by 2020 our carbon price and renewable energy target certificate are going to well and truly cover the difference. What we need now is capital funding up front, and I have just given you some idea of what that magnitude is.⁴²

39 Dr David Brockway, CSIRO, *Proof Committee Hansard*, p. 103.

40 Mr Andrew Richards, Executive Manager, Government and Corporate Affairs, Pacific Hydro *Proof Committee Hansard*, 30 April 2009, p. 158

41 Ms Susan Jeanes, Chief Executive Officer, Australian Geothermal Energy Group, *Proof Committee Hansard*, 30 April 2009, p. 145.

42 *Proof Committee Hansard*, 30 April 2009, pp 157-158.

Hydro

5.67 Hydro electric power is one of the more long-standing forms of renewable energy used around the world.⁴³

5.68 A 2008 Parliamentary Library research paper entitled 'the potential for renewable energy to provide baseload power' noted there were 100 hydroelectric power stations with 7050 MW capacity providing about 16,000 GWh annually.⁴⁴

Ocean Power (Wave & Tidal)

5.69 Wave and tidal powers present two different forms of power which can be derived from oceans.

5.70 Dr Ray Wills, Chief Executive, Western Australian Sustainable Energy Association, gave the following evidence to the committee:

Dr Wills—There are great opportunities in tidal power around the world and certainly in the Kimberley. People who are generating tidal power are moving away from tidal basin storage and simply using the current of the tide itself. We have seen significant investment, again in the United Kingdom, in tidal power.

Senator IAN MACDONALD—We have had a look at the Horizontal Waterfalls. Is that for real? It is very remote. Is there any prospect with that?

Dr Wills—Again, the problem is very remote generation. If you want to take it to another location you need to use DC transmission. I know that the network providers have been looking at that in terms of their own research and development. If we want to transport energy long distances through wires, we cannot do it with AC, we have to go to DC. There are alternatives to that of course. You can find a transportable fuel source—hydrogen is one example, but it may not necessarily be the best one.⁴⁵

5.71 Mr Ali Baghaei, Chief Executive Officer, Oceanlinx in his evidence to the committee said that his company has had a wave power operational model plant near Port Kembla, NSW, since 2006.⁴⁶

43 Parliamentary Library, Research Paper, 'The Potential for renewable energy to provide baseload power in Australia', p. 11.

44 Parliamentary Library, Research Paper, 'The Potential for renewable energy to provide baseload power in Australia', p. 12.

45 Dr Ray Wills, Chief Executive, Western Australian Sustainable Energy Association, *Proof Committee Hansard*, 20 April 2009, p. 55.

46 Mr Ali Baghaei, Chief Executive Officer, Oceanlinx, *Proof Committee Hansard*, 30 April 2009.

Biofuels

5.72 The committee also received evidence from witnesses in relation to biofuels, particularly in reference to transport.

5.73 In its submission to the committee, Renewable Fuels Australia stated that Biofuels are already in wide use around the world:

Biofuels such as ethanol and biodiesel have already demonstrated the capability to secure net carbon (CO₂) reductions ranging from 30% using dedicated feed corn in the U.S., to between 50% to 87% in net reductions in Australia - based on industry and CSIRO life cycle analysis in Australia. No other demonstrated alternative fuels can offer proven carbon reduction benefits of this magnitude at this time or in the near future.⁴⁷

5.74 The Grain Growers Association in their submission to the committee called for 'continued development of, and support for, renewable fuel sources such as biofuels as part of a wider strategy of energy security'.⁴⁸

5.75 The committee notes that the possible role of biofuels is one of the terms of reference of the Senate Select Committee on Fuel and Energy, which in its interim report recommended 'that incentives be provided to encourage research and development of second generation biofuels'.⁴⁹

Methane Gas Capture

5.76 Methane is a particularly potent greenhouse gas, with 21 times the impact of carbon dioxide.⁵⁰

5.77 Evidence was presented to the committee regarding how the CPRS may affect methane capture from mining and waste management facilities.

5.78 Power generation from methane captured from landfills and fugitives from mining is currently supported by various programmes at Commonwealth and state/territory level, including the NSW Greenhouse Gas Reduction Scheme (GGAS) and the Commonwealth's Greenhouse Friendly programme.

5.79 It has been announced that no new greenhouse gas abatement projects will be considered by the Greenhouse Friendly programme from 4 February 2009.

47 Renewable Fuels Australia, *Submission 16*, p. 1.

48 Grain Growers Association, *Submission 355*, p. 7.

49 Senate Select Committee on Fuel and Energy, Interim Report: *The CPRS: economic cost without environmental benefit*, May 2009, Recommendation 16.

50 Methane (CH₄) is defined under the National Greenhouse and Energy Reporting Regulations 2008 (Reg2.02) as having a global warming potential (GWP) of 21, or 21 times greater than that of CO₂. The GWPs in the NGER Regulations are based on IPCC figures.

5.80 In the *White Paper*, the Government undertook to work with the NSW and ACT governments to develop 'appropriate transitional arrangements' away from GGAS.⁵¹

5.81 Mr Max Spedding, Secretary, Australian Landfill Owners Association, gave evidence to the committee that a number of landfills generate sufficient methane to facilitate power generation:

Interestingly, a substantially larger landfill is needed to get to the point where it is economical to produce renewable energy because of the level of the RECs, the renewable energy certificates. In the past we have had the greenhouse friendly [NSW Greenhouse Gas Abatement Certificates], which gave support to this. These go under the CPRS. What is needed at the moment to have a good return on investment for power generation is three megawatts of capacity – that is, basically three large engines and generators. A landfill of around 200,000 to 300,000 tonnes gives the capacity to run such an installation for 20 to 30 years. In Australia, in round figures only 30 or 40 landfills out of the total are that size.⁵²

5.82 Evidence was given to the committee that another prominent source of methane emissions is the release of fugitive emissions from coal mining operations.

5.83 Mr David Hamill of Envirogen Pty Ltd gave evidence advocating the inclusion of fugitive methane emissions from coal mining in the Renewable Energy Target:

We have been abating fugitive emissions since 2000, and our industry has a total installed generating capacity of 215 megawatts. Practically, this means we provide sufficient power to electrify over 210,000 homes. That is equivalent to powering a city about 1½ times the size of Canberra. At the same time—and this is important—while providing that amount of power we are also removing the impact of emissions equivalent to 1½ million cars on our roads. Providing the waste coalmine gas industry has a regulatory environment which enshrines an ongoing investment incentive, our industry has the capacity to double its abatement contribution and assist Australia in outperforming its Kyoto targets. By including the contribution of waste coalmine gas within the proposed expanded renewable energy target, the industry has potential, with funding available, to increase its contribution to fugitive emission abatement from its present level of about 6½ million tonnes of carbon equivalent per annum to over 12 million tonnes of carbon equivalent per annum. This would increase Australia's abatement of fugitive emissions from eight million tonnes of carbon equivalent per annum to 14 million tonnes of carbon equivalent per annum, which would

51 *White Paper*, p. 15-8.

52 Mr Max Spedding, Secretary, Australian Landfill Owners Association, *Proof Committee Hansard*, 22 April 2009, p. 48.

be a 75 per cent increase during the Kyoto commitment period of 2008-12.⁵³

5.84 Mr Seamus French, CEO of Anglo Coal, in his evidence to the committee noted that gas from its mines is used in the powers stations at German Creek and Moranbah, but that the economic viability of this is dependant on revenue obtained via the NSW GGAS.⁵⁴

5.85 Energy Developments also raised concerns about the impact of the loss of revenue from the NSW GGAS.⁵⁵

Committee view

5.86 The committee is cautious about suggestions to include methane as an eligible source in the expanded renewable energy target, on the basis that fugitive methane from mining operations is not strictly speaking a 'renewable' source of energy.

5.87 The committee is concerned about the possible loss of opportunities for abatement from the production of energy from methane. While there may be little practical difference in terms of emissions as to whether methane from such sources is combusted by being flared on site or combusted in power generation, this source has the potential to offset energy and emissions that would otherwise be produced by other sources.

5.88 The committee urges the Government to expedite discussion with the ACT, NSW and Queensland governments regarding transitional arrangements for companies currently receiving revenue from the NSW GGAS programme, and continued support for these activities under the CPRS. The failure to clarify these arrangements is a significant flaw in the CPRS proposal and is creating uncertainty for several companies currently undertaking useful mitigation work.

Recommendation 3

5.89 The committee recommends any remodelled CPRS legislation clarify future arrangements to provide continued support for methane gas capture and energy generation following the foreshadowed cessation of state based schemes.

Recommendation 4

5.90 The committee recommends that the Government work with the NSW, ACT and Queensland governments to clarify, as a priority, transitional arrangements for power generation projects from waste methane which may be affected by the possible cessation of the NSW GGAS and similar programmes.

53 Mr David Hamill, Envirogen Pty Ltd, *Proof Committee Hansard*, 21 April 2009, pp 44-45.

54 Mr Seamus French, Chief Executive Officer, Anglo Coal, *Proof Committee Hansard*, 28 April 2009, p. 115.

55 Energy Developments, *Submission 511*.

Capacity constraints on take up of renewable energy

5.91 In 2005-06, renewable energy sources made up approximately 7.6 per cent of total electricity production in Australia, with 82 per cent of this coming from hydro.⁵⁶

5.92 This suggests that building up supply to meet any increased demand would not be instantaneous. However, ActewAGL noted that supply would grow to meet demand:

If you had a new mandated renewable energy target that went from two per cent to 20 per cent, people would build the renewable energy to go with it, because we retailers would be required by law to buy it. What happens if we cannot sell it is going to be the interesting thing.⁵⁷

5.93 Evidence was given to the committee that the cost of transmission was noted as a potential obstacle to the greater take-up of renewable energy sources, particularly given the distance of many sources (e.g. wind and geothermal) from major population centres. ERM Power stated:

The idea that the wind from the southern states of Australia can get to the loads on the eastern seaboard north of there without huge—tens of billions of dollars—expenditure in transmission is daunting. Of course the transmission authorities—Powerlink, Transgrid, Grid Australia—are struggling with how they work within the present regulatory test rules to meet these daunting options they have for where power will come from with, the RET scheme especially. The concept is that so much electricity has to be moved to areas a long way away from the thing.⁵⁸

5.94 The Australian Academy of Technological Sciences and Engineering called for planning of electricity grids to 'provide for the long term demands of a diversity of technologies supplying power, both base load and intermittent renewables, distributed locations for some power generation and the need to system stability under varying supply and demand situations.'⁵⁹

5.95 Against these costs can be seen the potential costs of climate change on existing infrastructure networks. The Energy Networks Association provided the committee with estimates by Parsons Brinckerhoff of a \$2.5 billion cost to energy networks arising from climate change in the next five years, with the largest

56 Parliamentary Library, Research Paper, 'The potential for renewable energy to provide baseload power in Australia', p. 4.

57 Mr Michael Costello, Managing Director, ActewAGL, *Proof Committee Hansard*, 30 April 2009, p. 161.

58 Mr Trevor St Baker, Executive Director, ERM Power, *Proof Committee Hansard*, 28 April 2009, p. 79.

59 Australian Academy of Technological Sciences and Engineering, *Submission 510*, p. 2

proportion arising due to the need to augment networks to cope with increased demand for airconditioning.⁶⁰

Measures to promote renewable energy

5.96 The committee heard evidence supporting additional government intervention to further support and develop the renewable energy sector.

5.97 One witness noted the important role that complementary measures can play in minimising risk for investors in new technologies:

I think one of the issues which underpins achieving the CPRS and the goals is the role of the private sector in delivering the outcomes. The investment community and the industry will be required to take on a lot of this work. At the moment, the policies are structured in a way so that a lot of the risk is transferred to them. There may be a five per cent target but there may be a 25 per cent target, so start planning for a 25 per cent target. But that is a very big risk for an investor to take. Geothermal might come in at 8c, but it might come in at nine. In that case, it may be able to compete with wind or it may not. Those are very big risks that you are asking your entrepreneurs, your green champions, to take on.

The role of the complementary measures is to take that risk off them and to provide a nice stable environment. Essentially, you are bringing them up to speed so that they can then transfer it into the future carbon market and also allow for CPRS to have much more ambitious goals down the track. The role is to try and create very stable things like feed-in laws and to provide very stable prices that those markets can interact with. In the end, that will also make the CPRS more competitive because there will be more industries which are commercially viable and which will be competing with each other down the track. That will eventually lower the cost of the CPRS. I would certainly direct the committee to our work but also the work that has been done by McLennan Magasanik Associates on these issues, which comes to the same conclusion that a CPRS with complementary measures is, in the end, cheaper than a CPRS without complementary measures.⁶¹

5.98 Other submissions received by the committee concerning measures to promote renewable energy discussed the appropriateness and impact of the Renewable Energy Target, as well as calls for additional assistance in the form of feed-in tariffs, greater support for research and development, and direct grants to support pilot projects and assisting emerging technologies get ready for commercialisation. These are discussed in the text below.

5.99 Several submissions argued that the CPRS as proposed in the *White Paper* and exposure draft legislation would have a negative impact on uptake of renewable energy and other measures to mitigate climate change:

60 Energy Networks Association, *Submission 307, Attachment A*, p. 8.

61 Dr Karl Mallon, Climate Risk Pty Ltd, *Proof Committee Hansard*, 20 May 2009, p. 39.

The current scheme may have a negative impact on community willingness to continue participating, hence reducing demand for energy efficient and renewable energy technologies such as efficient lights and appliances, insulation and shading, purchasing green power, home photovoltaic power systems or solar water heating systems.⁶²

5.100 The committee is of the view that complementary measures, such as renewable energy targets or feed-in tariffs, must be subjected to closer scrutiny to ascertain if such these measures are able to complement the CPRS (or other measures agreed to by the Parliament).

5.101 The committee notes that these have associated costs.

Renewable Energy Target

5.102 One of the major initiatives which will be used by the Government to support the development of renewable energy sources is the expanded Renewable Energy Target (RET).

5.103 The Renewable Energy Target is intended to build on the existing Mandatory Renewable Energy Target (MRET). MRET was established by the *Renewable Energy (Electricity) Act 2000* and the *Renewable Energy (Electricity) (Charge) Act 2000*.

5.104 The MRET has been in force since 1 April 2001.

5.105 Under MRET, wholesale purchasers of electricity must contribute to a target of 9500 gigawatt hours (GWh) of renewable energy by 2010. This is demonstrated through the purchase of Renewable Energy Certificates (RECs), tradeable certificates generated by accredited renewable power stations, solar water heaters and eligible generation units.⁶³ Shortfalls in RECs can be carried over to subsequent years, with a penalty payment of \$40 per REC owing if the REC shortfall is greater than 10 per cent of the total REC liability.⁶⁴ RECs continue to exist for the life of the scheme unless surrendered.

5.106 The Government has announced that it will seek the expansion of the Renewable Energy Target to 20 per cent (or 45,000 GWh) by 2020.

5.107 It is stated in the *White Paper*:

62 Sustainable Energy Policy Queensland, *Submission 760*, p. 6.

63 Office of the Renewable Energy Regulator, Fact Sheet 'MRET: the Basics', <http://www.orer.gov.au/publications/pubs/mret-thebasics-0309.pdf>, viewed 30 April 2009.

64 Office of the Renewable Energy Regulator, 'Determining Liable Grids, Liable Purchases of Electricity and REC Liabilities, and Discharging Liabilities,' <http://www.orer.gov.au/publications/pubs/determining-liabilities-0309.pdf>, viewed 30 April 2009.

While the [Carbon Pollution Reduction] Scheme will help bring renewable energy technologies into the market over time, the RET will accelerate their use. The RET is an important transitional measure that will support the development of a domestic renewable power industry and prepare the electricity sector for its contribution to the significant emissions reductions needed to tackle climate change. The measure will help ensure that renewable energy technologies can be readily deployed when the price signal under the Scheme makes those technologies more competitive.⁶⁵

5.108 Among further benefits the government sees from an expansion of the RET is the replacement of existing and possible future state/territory government schemes such as the Victorian Renewable Energy Target (VRET) with a single national scheme. The establishment of the RET is being progressed through the COAG Working Group on Climate Change and Water.⁶⁶

5.109 On 30 April 2009, the expanded RET received the endorsement of COAG, with arrangements in place to 'smooth the transition' of state schemes into the national RET. The Government has pledged to compensate householders for the cost of emissions trading and of the renewable energy target.⁶⁷

5.110 COAG also agreed to put in place legislative exemptions from liability under the expanded RET (but not the existing MRET) for electricity-intensive trade-exposed industries. The partial exemptions will apply at differentiated rates (60 or 90 per cent), and will be based on activities which receive 60 or 90 per cent EITE assistance under the CPRS.⁶⁸

Questioning the need for an expanded RET

5.111 The need for any expansion of the RET in conjunction with the introduction of a CPRS was questioned by some who gave evidence to the committee.

5.112 In its submission to the *Garnaut Review*, the Productivity Commission noted:

An MRET operating in conjunction with an ETS would not encourage any additional abatement, but still impose additional administration and monitoring costs. To the extent that the MRET is binding (which is its purpose) it would constrain how emission reductions are achieved – electricity prices would be higher than otherwise and market coordination about the appropriate time to introduce low-emissions energy technologies

65 *White Paper*, p. 19-4.

66 Department of Climate Change Website, <http://www.climatechange.gov.au/renewabletarget/consultation/index.html>, viewed 30 April 2009.

67 *Canberra Times*, 'Households "foot the bill" for industries', 30 April 2009.

68 Department of Climate Change factsheet, 'Renewable Energy Target Scheme Design', <http://www.climatechange.gov.au/renewabletarget/pubs/RET-scheme-design.pdf>, viewed 6 May 2009, p. 3.

would be overridden. If it was non-binding, it would simply increase administrative, compliance and monitoring costs.⁶⁹

5.113 The Energy Users Association of Australia (EUAA) in their submission to the committee state that that RET would lead to distortions when imposed in conjunction with the CPRS.

5.114 EUAA argued that the RET would add \$8-\$9 to the cost of electricity per megawatt hour by 2020, which the EUAA regard as a subsidy of some \$23 billion from energy users to renewable energy suppliers over the life of the RET. These estimates were provided prior to the COAG announcement to exclude major energy users from the expanded RET.

5.115 EUAA state that:

The RET has implications for the generation fuel mix that will emerge with any ETS operating in concert with the RET. It is quite conceivable that up to 2020 the scheme will override the ETS and distort the structure of generation towards higher cost renewable technologies that will crowd out other lower cost and lower emissions technologies, e.g. gas fired generation and cogeneration. One perverse result may be that the life of coal-fired electricity is prolonged, which is more emissions intensive and would make our emissions reduction target more difficult to achieve. These impacts could be compounded if the RET can only be achieved by increasing use of wind farms that are less and less economic (e.g. due to the need to use poorer wind resources or develop plants in areas that are more remote from the electricity network), or into higher cost non-wind renewable energy technologies as the most economic wind resources are exhausted. The 20% RET will also make the power system less reliable and more difficult to manage due to the intermittent nature of wind and some other renewable technologies. This will impose additional costs on top of the direct costs of the scheme.⁷⁰

5.116 Professor Ross Garnaut noted that a renewable energy target was a less efficient means of reducing emissions than an emissions trading scheme, and questioned the need for both measures if the ETS is effectively designed:

If you were comfortable with all of the parameters of an ETS and you thought that the targets were right and other dimensions of the scheme were right, I do not think you could make a case for the renewable energy target. It would be redundant. Any case for the renewable energy target depends on your not thinking that the ETS is defined in a way that will do the job. You do not think the targets are ambitious enough or you think something else is wrong with it.⁷¹

69 Productivity Commission, *Submission 24 Attachment A*, p. xvii.

70 Energy Users Association of Australia, *Submission 466*, pp 12-13.

71 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, p. 55.

Evidence supporting the RET

5.117 Evidence given by the Roaring 40s (a wind energy developer with projects in Tasmania, South Australia and Victoria) described continuation of support for renewables through an expanded RET as 'fundamental to the ongoing development of renewable energy projects in Australia, particularly until a sufficient carbon price is reflected in wholesale electricity prices'.⁷²

5.118 The Climate Institute welcomed the COAG announcements on the expanded RET and Energy Efficiency strategy on the basis that there were a 'solid start towards stimulating billions of dollars of investment and creating thousands of new jobs in renewable energy and efficiency,' providing a 'good start to a low carbon economy'.⁷³

5.119 Dr Paul Simshauser of AGL gave evidence to the committee that an ETS and the RET were complementary, rather than incompatible, measures:

...if you look at every government around the world trying to tackle carbon pollution, you will see they do not just pull out the one stick and throw it in the fire; there is a three-pronged approach that all governments are looking to take to try to crack this nut. Usually, the centrepiece will be some form of emissions trading as a sort of a broader industry approach to dealing with emissions. The second stream is usually a renewables target of some description, and it usually has a much longer time frame—its objectives are usually longer term. The issue there is that, if all you do is an emissions trading scheme, industry will continue to pick off the low-hanging fruit and will not look over at the next technology horizon. The third leg of it will usually be an energy efficiency scheme. So it is really important that we actually continue to push all three policy approaches, to make sure we have got a balanced approach to dealing with this issue.⁷⁴

5.120 Dr Richard Denniss in his evidence to the committee argued the RET not only provided useful support for the renewable energy sector, but was necessary in Australia's case to address the perceived failures of the CPRS:

Because the CPRS is so flawed, because the targets are so low and because the carbon price will be both so low and so volatile, the CPRS will not drive any investment in renewable energy. So we have had to have a second measure such as the RET, which I support and which will certainly provide for a substantial investment in renewable energy. It will do so at additional cost but, again, that comes back to my assertion that the CPRS clearly does not deliver least-cost abatement. That is why we are spending \$4 billion on insulation and that is why we have a 20 per cent MRET. So, while I think it

72 Roaring 40s, *Submission 512*, p. 2.

73 Mr Erwin Jackson, Director Research and Policy, Climate Institute, *Proof Committee Hansard*, 1 May 2009, p. 73.

74 Dr Paul Simshauser, AGL, *Proof Committee Hansard*, 21 April 2009, p. 7.

is a good idea in terms of driving investment in renewables, the interconnection between the two is evidence of how flawed the CPRS is.⁷⁵

Costs of the RET

5.121 Treasury gave evidence that adding the RET to an emissions trading scheme would increase retail electricity prices between 2010 and 2020 by two to four per cent more than the costs of the ETS alone. The cost per unit of abatement under the RET is estimated to be three times higher. The combination of the CPRS and the RET is estimated to increase electricity prices by about 20 per cent for average Australian household electricity in the period 2010 to 2015, and wholesale electricity prices by 48 per cent.⁷⁶

5.122 Treasury gave evidence that its estimates for the impact on the RET have the advantage of drawing on empirical data arising from the experience with MRET.⁷⁷

5.123 Industry witnesses disagreed with the Treasury's cost estimates. The committee heard evidence that many industries estimated much higher costs arising from RET, particularly in conjunction with the CPRS.

5.124 The Australian Industry Greenhouse Network noted (prior to the announcement of COAG's decision to exempt major energy users from the RET):

What does the MRET or the proposed RET do? Again, I think you will hear from some of my members who have done some work on that, particularly the electricity intensive ones. Their calculations suggest that in the range of permit prices for the emissions trading scheme, which, let us say, is \$20 to \$40, the RET scheme is likely to impose just as big an increase on electricity prices on them. So, you are right: it is a double imposition of the same price.⁷⁸

5.125 Rio Tinto estimated that the additional costs imposed by the RET on their operations (mostly in the aluminium operations) would be an additional \$600 million in the decade to 2020.⁷⁹

75 *Proof Committee Hansard*, 15 April 2009, p. 33.

76 Ms Meghan Quinn, Manager, Climate Change Modelling Unit, Treasury, *Proof Committee Hansard*, 1 May 2009, pp 101-102

77 Ms Meghan Quinn, Treasury, *Proof Committee Hansard*, 30 April 2009, p. 11.

78 Mr Michael Hitchens, Chief Executive Officer, Australian Industry Greenhouse Network , *Proof Committee Hansard*, 15 April 2009, p. 33.

79 Mr Steve Hodgson, President and Chief Executive Officer, Bauxite and Alumina, Rio Tinto Alcan, *Proof Committee Hansard*, 28 April 2009, p. 126. This estimate was provided before the COAG announcement relating to exemptions.

5.126 The National Lime Association in its submission to the committee also gave evidence raising concerns about substantial additional costs imposed by the duplication of the RET and the CPRS:

Renewable Energy Target (RET)... duplicates the CPRS

- doesn't meet the CoAG principles for Climate Change mitigation
- Will add substantial costs to the industry in addition to the CPRS
- Was not supported by Garnaut or the Productivity Commission reviews of the CPRS
- will become a higher percentage of consumed power due to the reducing electricity demand expected from the CPRS, and making the program more costly.⁸⁰

5.127 Even with the announced exemptions, some industry witnesses gave evidence that the continued existence of MRET (which will continue without exemptions) and expansion of the RET will impose higher costs.

5.128 Following the announcement of the COAG decision, the Australian Aluminium Council estimated the renewed RET would cost the industry \$130 million per year by 2020.⁸¹

5.129 Alcoa indicated that its costs for the existing MRET will come to \$20 million and the costs associated with the expanded RET an estimated \$4 million to \$5 million in 2020.⁸²

5.130 The committee received evidence from witnesses criticising the decision to partially exempt trade exposed industries on the grounds it imposes additional costs on the remaining participants in the scheme.⁸³ This possible consequence was recognised by the COAG Working Group on Climate Change and Water in December 2008, which noted the risk that 'to meet the Government's target, an increased cost burden would be imposed on the remaining liable parties. Higher electricity costs would be borne by businesses and households'.⁸⁴

80 National Lime Association of Australia, *Submission 468*, p. 5.

81 Mr Miles Prosser, Executive Director, Australian Aluminium Council, *Proof Committee Hansard*, 1 May 2009, p. 57.

82 Mr Tim McAuliffe, Manager, Environment and Sustainable Development, Alcoa of Australia, *Proof Committee Hansard*, 1 May 2009, pp 26-27.

83 See for example the Australian Conservation Foundation, quoted in *Sydney Morning Herald*, 'Big Polluters win exemption from renewable energy', 30 April 2009; Climate Institute, quoted in *Canberra Times*, 'Households "foot the bill" for industries,' 30 April 2009.

84 COAG Working Group on Climate Change and Water, Discussion Paper, 'Treatment of electricity-intensive, trade-exposed industries under the expanded national Renewable Energy Target Scheme,' December 2008, p. 8.

5.131 Treasury's evidence was that it had not undertaken modelling of the costs of these exemptions:

Senator MILNE—On the renewable energy target, have you modelled what exempting all of the large emitters would do to the cost of the renewable energy target to the rest of the economy? I am particularly thinking in terms of groceries, from the food processing sector, and households, commercial entities and so on. Have you modelled the full exemption from the RET, the energy intensive trade exposed, and from the coal fired power stations, and so on?

Ms Quinn—Not for the modelling that we did for the renewable energy target. We applied the renewable energy target across all electricity users. It is the case with all analysis with CG models that if you restrict coverage of a particular component, whether it be what part of the economy is faced with an emission price or which elements of the economy are covered by a particular scheme, we find typically that narrowing the scope on which the policy acts increases the economic costs to the economy in aggregate. It obviously has different impacts at the sector level, but narrowing the focus on a particular component tends to raise the aggregate economic costs of any policy.

Senator MILNE—If the government did move to exempt the big emitters from the RET completely, would we see an aggregate increase in cost to the whole economy and a much higher cost to the remainder of the economy?

Ms Quinn—We have not undertaken that modelling. There are some possible offsets depending on exactly how the exemption happens, but a general principle is that a narrower scope raises costs.⁸⁵

5.132 The committee notes that granting exemptions from participation may increase the administrative complexity of the RET. As the debate since the release of the *Green Paper* demonstrates, there is considerable room for argument about which sectors should be entitled to assistance, the nature of that assistance, as well as the need to deal with competing claims from those organisations which fall the wrong side of the line.

5.133 Some in the renewable energy sector argue that the RET tends to favour existing technology (such as wind) over emerging technologies. ActewAGL reinforced this point from the perspective of a power purchaser:

Just looking at this from an electricity purchaser point of view, if there is a 20 per cent target now, that we will have to buy 20 per cent of our electricity from renewables, we will buy the cheapest renewable, because our customers will say, 'I'm happy to buy renewables, but I want to buy the cheapest renewable', not, 'I'm happy to subsidise a more expensive one.' If wind power is the cheapest renewable on the grid, that is what we will buy. The point I am trying to make is that the only way to make the others more competitive is if they bring their prices down, and that will probably require

a subsidy for them in some way such as the way I have talked about with solar. It is a fact that the way the market works our customers will want the cheapest renewable energy they can get, and you can understand why from their perspective.⁸⁶

5.134 As capacity in the cheapest form of power is exhausted, purchasers will go to the next most expensive form. This suggests that, if a policy decision is taken to foster the development of power sources which are currently at the more expensive end of the price curve, reliance on the RET will not be sufficient to drive this development and more targeted forms of assistance will be required.

Committee view

5.135 The expansion of the RET is certainly a means of stimulating development of the renewable energy sector. It has the potential to be an effective complement to the CPRS. In conjunction with the CPRS, it will not lead to any reduction in emissions beyond those delivered by the CPRS itself. If there is no CPRS, the RET could have a stronger role in driving the economy to less carbon intensive sources of energy.

5.136 The expansion of the RET appears to be targeted to assist in the transition to a carbon constrained economy by providing a short-term stimulus to alternative energy sources, in the expectation that this will bring them into a competitive position sooner.

5.137 The committee notes that whilst the RET may be a means of stimulating development and research of renewable energy sources it should not be the only way of doing this.

5.138 The committee is very concerned at the conflicting evidence given by Treasury and industry in relation to costs associated with the expansion of the RET.

5.139 The committee notes that the impact of exemptions of major energy users is unclear, could lead to significant cost increases to be borne by other sectors of the economy and may reduce the overall effectiveness of the RET expansion.

5.140 Further detail on the impacts of the exemption, and explanation of differences in projected costs, must be addressed by the government in the Regulatory Impact Statement which will be provided at the time the Renewable Energy (Electricity) Amendment Bills are introduced into Parliament (currently expected to be during the Autumn 2009 sittings).

Recommendation 5

5.141 The committee recommends that the Government consider in detail different claims made about the probable expense of the expanded Renewable Energy Target. Analysis of the different cost estimates should be included in the

86 Mr Michael Costello, Managing Director, ActewAGL, *Proof Committee Hansard*, 30 April 2009, pp. 168-169.

Regulatory Impact Statement (RIS) accompanying the legislation to amend the Renewable Energy (Electricity) Act 2000.

Recommendation 6

5.142 The committee recommends that following the decision by COAG on 30 April 2009 to exempt major emitters, the Government should explain in the RIS accompanying the amendment bills:

- **any differences in costs caused to householders and other industry sectors arising from the decision;**
- **the impact the exemptions will have on the efficiency and effectiveness of the scheme; and**
- **the form which compensation to householders will take.**

Feed-in Tariffs

5.143 Another option presented in evidence to the committee for supporting greater uptake of renewable energy is the introduction of a national feed-in tariff. In Australia, according to the company Wind Energy and Solar Power, all mainland state and territory governments have introduced or are in the process of introducing feed-in tariffs.⁸⁷

5.144 Dr Ray Wills, Western Australian Sustainable Energy Association, gave evidence to the committee that the advantage of a feed-in tariff over the MRET is the ability to direct market stimulus to particular types of technologies:

One of the things that you can do with a feed-in tariff is to target it to base load generators and to peak load generators and therefore at a commercial scale start to address some of the design flaws that are in the mandated renewable energy target. It is a simple way to offer market certainty in a way that the MRET does not.⁸⁸

5.145 Similar views were noted by Solar Systems Pty Ltd, who argued that systems like the RET favour cheaper existing technologies.⁸⁹

87 Wind Energy & Solar Polar Power website, <http://www.energymatters.com.au/government-rebates/feedintariff.php#act>, viewed 12 June 2009.

88 Dr Ray Wills, Western Australian Sustainable Energy Association, *Proof Committee Hansard*, 20 April 2009, p. 54.

89 Mr Barry Hendy, Business Development Manager, Solar Systems Pty Ltd, *Proof Committee Hansard*, 30 April 2009, p. 150.

5.146 Supporters of the introduction of a national feed-in tariff included the Clean Energy Council,⁹⁰ Conservation Council of South Australia,⁹¹ the Conservation Council of Western Australia,⁹² Greenpeace,⁹³ and Clean Energy for Eternity.⁹⁴

5.147 The Energy Suppliers Association of Australia argued that feed-in tariffs increase energy costs for all energy users, citing estimates of abatement costs ranging from \$200 to \$1500 per tonne of CO₂e. They argue the greatest impact of such increased costs will be on low income groups who spend a greater proportion of income on energy.⁹⁵

5.148 Equity concerns concerning feed-in tariffs at the domestic residential level were also raised by ActewAGL:

No discourtesy to those who are supporters of a feed-in tariff, but on a domestic residential model it has certain problems. It is deeply inequitable, because the people who can afford it tend to be people with some reasonable amount of money. Here [in the ACT] it is a gross tariff of 50c a kilowatt hour, which is pretty good. It is about four times what we sell our retail tariff for normal energy. That cost, of course, has to be borne by the whole of the community, including the poorer people of the community who spend 15 per cent of their budget on energy as against the better off people who spend five per cent of their budget on energy. There is an equity issue there and, also, it is very expensive.⁹⁶

5.149 ActewAGL argued that feed-in tariffs can be appropriate, but are more efficient if aimed at larger facilities rather than at householders.⁹⁷

Support for research and development

5.150 Evidence was given to the committee supporting enhanced commitment to funding research and development, including supporting the development of pilot projects.

90 Mr Russell Marsh, Policy Manager, Clean Energy Council, *Proof Committee Hansard*, 20 May 2009, p. 66.

91 Conservation Council of South Australia, *Submission 517*.

92 Conservation Council of Western Australia, *Submission 432*.

93 Mr John Hepburn, Coordinator, Climate and Energy Campaign, Greenpeace, *Proof Committee Hansard*, 20 May 2009, p. 38.

94 Clean Energy For Eternity, *Submission 724*.

95 Energy Suppliers Association of Australia, *Submission 424*, p. 15.

96 Mr Michael Costello, Managing Director, ActewAGL, *Proof Committee Hansard*, 30 April 2009, p. 149.

97 Mr Michael Costello, Managing Director, ActewAGL, *Proof Committee Hansard*, 30 April 2009, p. 159.

5.151 Professor Andrew Blakers recommended that the Energy Innovation Fund be expanded to \$1 billion over seven years, with additional funding to be provided to support commercialisation and manufacturing of new technologies.⁹⁸

5.152 The Energy Users Association of Australia supported greater funding for research and development:

The EUAA believes that revenues generated from emissions prices or via carbon tax revenue should be directed towards developing low emissions technologies. The emergence of technologies, some of which offer zero or close to zero emissions, will be vital to a low cost and environmentally effective path to managing carbon. These technologies can be fossil fuel based (carbon capture and storage, clean coal, coal drying, oxy-firing, nuclear), or renewables based (hydro, biomass, wind solar, thermal, wave). The portfolio mix of the above technologies, and the time taken to progress their development would be a crucial determinant of the extent of the increase in energy prices.⁹⁹

5.153 Professor Ross Garnaut in his evidence to the committee stated that, whilst a carbon price can drive innovation, it may not be sufficient on its own to drive research into new technologies:

I think research, development and commercialisation of new technology is essential alongside the ETS. You need two drivers of structural change of the kind to which you were alluding. One is the carbon price. The other is the support for innovation with the new technologies. Why can't the carbon price alone do it? The market cannot deliver an optimal amount of research, development and commercialisation for the very simple reason that the innovator, the company that makes the first moves, is spending a lot of money on learning that everyone benefits from and it cannot capture all the benefits for itself and so it will not do enough of it from society's point of view unless there is government support alongside the private effort for development of those new technologies. To drive the structural change you need the substantial support for research, development and commercialisation of new technologies, as well as the carbon price.¹⁰⁰

5.154 The committee encourages further work by government in this area.

Fuels and energy generation: agriculture

5.155 Evidence was given to the committee that an area of opportunity for the agricultural sector was in fuels and energy generation. The Grain Growers Association gave evidence of how abatement and/or mitigation measures more broadly could be applied to agricultural models of income generation:

98 Professor Andrew Blakers, Australian National University, *Submission 271*, p. 2.

99 Energy Users Association of Australia, *Submission 466*, p. 14.

100 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, pp 49-50.

[There is]...the correspondence of almost all of the wind energy and almost all of the solar energy with almost all of the farmland. How do we capture that as an opportunity so that we have renewable solar powered and wind powered energy sources which local small farmers can engage in[?]....The issue of jobs and regional development flows from that because you get the regional servicing and the regional construction and other things that go with it.¹⁰¹

5.156 The Western Australian Farmers' Federation described current efforts in that state:

One of the other things we are doing involves mallees and biomass. One way to become self-sufficient is to generate our own fuel. That is in our carbon footprint. We have to start thinking outside the square to establish how to do this practically. We have plenty of land; all we have to do is think about how we can marshal our forces a bit more effectively than we have done in the past.¹⁰²

5.157 The Tasmanian Farmers and Graziers Association also referred to such opportunities:

We believe that renewable energy has huge potential for agriculture or landownership. We have stacks of wind, soil, biomass, sun, biofuels and other things. A lot of our members talk to us constantly about this area. We run forums around the state, talking to farmers, and usually the biggest single topic of discussion is the opportunities for renewable energy on farm.¹⁰³

5.158 The committee notes that there are opportunities for agriculture in generation of renewables as well as costs. The committee encourages the further exploration of these opportunities wherever possible.

Nuclear Energy

5.159 During the course of the inquiry, references were made to nuclear energy as a low-emissions energy source to address climate change.

5.160 However, nuclear power was not a major focus of most submissions. As the Institute of Public Affairs noted:

Nuclear power faces apparently overwhelming political obstacles and even if adopted by governments, as in Japan would face considerable local opposition to new sites. Moreover, the replacement of existing power stations would require capital costs of several \$100 billions, and would

101 Mr Bryan Clark, Industry Development Manager, Grain Growers Association, *Proof Committee Hansard*, 16 April 2009, p. 79.

102 Mr Mike Norton, President, Western Australian Farmers Federation, *Proof Committee Hansard*, 20 April 2009, p. 99.

103 *Proof Committee Hansard*, 23 April 2009, p. 24.

moreover signify the end of the energy cost advantage Australia has enjoyed for over thirty years.¹⁰⁴

5.161 The committee notes that there have been numerous investigations of the potential role of nuclear energy in recent times, including by other Senate committees. Given the complexity and controversial nature of this issue (sufficient for an inquiry in its own right), the committee will not further address this topic.

Support for Innovation

5.162 Evidence was given by Dr Brian Fisher underlining the importance of continued research and development when he argued that 'without a major technical solution we will not have a solution to this problem'.¹⁰⁵

5.163 The committee is concerned that the CPRS may not sufficiently support innovation and new methods.

5.164 The committee received several proposals for emissions reduction, which the proponents claim would either not be adequately supported, or in some cases hampered by the CPRS.

5.165 For example, the committee received a submission from MBD discussing the possibilities of algae in reducing carbon emissions. The company's process involves the use of carbon dioxide emitted from power stations, in conjunction with sunlight and nutrient enriched waste water, to grow algae (using its proprietary technology) on surplus land at power stations. The company claims this algae sequesters carbon dioxide far more cheaply and simply than by CCS, and can be used as a form of bio-oil and cattle feed. The company argues that a full scale commercial pilot plant costing \$23.1 million would yield 35,000 tonnes of algae (consisting of 25,000 tonnes of algae meal and 10,000 tonnes of algae oil) per annum, abating 100,000 tonnes of CO₂e per annum.¹⁰⁶

5.166 The company has been involved in commercial and technical discussions with major power stations in Victoria, New South Wales and Queensland, having signed an MOU with one of them in March 2009. However, MBD has argued that these projects may be affected by the proposed CPRS design as a result of algae not being recognised as a form of abatement for participating power stations.

5.167 Similarly, Perdaman Chemicals and Fertilisers Pty Ltd noted that the conversion of low grade black coal into urea (a product which is used as a fertiliser

104 Institute of Public Affairs, *Submission 9*, p. 7.

105 Dr Brian Fisher, Concept Economics, *Proof Committee Hansard*, 30 April 2009, p. 219.

106 MBD, *Submission 1*, p. 3.

and could potentially be exported) may be adversely affected by the current design of the CPRS.¹⁰⁷

5.168 The committee is supportive of further development of new technologies, and encourages the government to look seriously at them and find ways, wherever possible, to enhance innovation in the area of climate change, including where necessary by making adjustments to the CPRS legislation.

Sequestration

5.169 The committee received evidence discussing the possibilities for capture and storage of emissions from industry.

5.170 The discussion of sequestration in this chapter should not be confused with biological means of sequestration. These are discussed at greater length in Chapter 6 dealing with land use and forestry.

Carbon Capture and Storage

5.171 Carbon capture and storage, or sequestration (CCS), involves the capture of CO₂ from coal or gas that is consumed—burnt or gasified—in order to produce electricity. The captured CO₂ is then stored or sequestered in underground reservoirs.

5.172 The committee notes that CCS has been an important issue in the debate about responding to climate change. Clearly, such technology is of particular interest not only to Australia, which is an exporter and heavy user of coal, but also to many countries where coal fired power stations are the predominant source of energy generation. The successful development of CCS technology could make a significant contribution to global abatement of CO₂ emissions, as the world transitions to low- or no-emissions technologies. Certain fixed processes such as lime and cement production, which due to their nature have limited opportunities for abatement, have a particular interest in CCS technology.

5.173 Dr John Brockway of the CSIRO noted that CCS had to be considered as an element in a diverse strategy for addressing climate change:

...if we are going to address climate change, it is now universally accepted that a wide portfolio of new low emissions power generation technologies, energy utilisation and efficiency technologies and transport technologies will be required to achieve those reductions in greenhouse gas emissions. A technology portfolio would be expected to include a number of these areas. For instance, in terms of the generation, low emissions coal fired and gas fired power generation, including carbon capture and sequestration; and renewable, including solar, wind, geothermal, biomass and ocean energy in its various forms. We will also probably require synergies between fossil fuels and renewable power generation systems or the technologies.

107 Perdaman Chemicals and Fertilisers Pty Ltd, in camera evidence, 1 May 2009.

Distributed energy, energy storage, energy utilisation efficiency and intelligent energy management are all going to be very important in reducing the intensity or the utilisation of energy, which is to do with energy efficiency, and of course low emissions transport, which is going to be an important part of the mix in the future. That is a broad portfolio of what we will need...¹⁰⁸

5.174 Dr Brockway expressed the opinion that CCS, along with certain other technologies, was an important area of focus for Australia's efforts, given our reliance on coal-fired power stations:

There are a number of areas that I think are important foci for Australia. Post-combustion capture from coal fired power stations is particularly important, in my view, because we do have 80 per cent of our electricity now coming from coal fired power stations, and some of those will be around for the next 30 to 50 years. If we are going to impact on greenhouse gas emissions we need a technology at the end of the day that can capture CO₂ from those sorts of plants. We need to focus on enabling technologies for gasification of coal. This is the IGCC. That is another important technology. We need to focus on how to reduce the cost of that technology. These enabling technologies for that are a good place for Australia to work and where we do have world leading research.

I spoke about disruptive and step change technologies for power generation from coal. Coal is our biggest single export. It is important to our economy, both as an export and for use in Australia. If we can come up even in the longer term with much higher efficiency technologies and we reduce the challenge of capturing and sequestering that CO₂, that is all to the good. I think that is an important one for Australia to focus on.¹⁰⁹

5.175 Geothermal, solar thermal, photovoltaics and energy storage systems were also technologies that Australia should focus on, given our natural advantages in these areas.¹¹⁰

5.176 Dr Brockway explained that current efforts with CCS were focused on a number of approaches involving different techniques.¹¹¹ In terms of timing he observed:

I would like to go on to talk about the timeframe for commercial adoption of low emissions technologies. In this I would not distinguish between low emission coal technologies and a whole range of renewables technologies, such as solar thermal, geothermal, wave power or ocean power of some sort, and biomass. Worldwide the timeframe is expected to be about 10 to 15 years before these become commercially adopted, and it will be different

108 Dr John Brockway, *CSIRO Proof Committee Hansard*, 16 April 2009, p. 96.

109 Dr John Brockway, *CSIRO Proof Committee Hansard*, 16 April 2009, p. 99.

110 Dr John Brockway, *CSIRO Proof Committee Hansard*, 16 April 2009, p. 99.

111 Dr John Brockway, *CSIRO Proof Committee Hansard*, 16 April 2009, p. 98.

for each technology. This is in part due to where they are on what we call the learning curve, how mature they are becoming. That timeframe will depend on the intersection between the rising cost of energy, as a consequence of increased costs for carbon, and the reducing cost of the technology that comes about through maturation.¹¹²

5.177 Dr Brockway observed that, as a rule of thumb, the time frame for successful commercialisation of mechanical or chemical engineering developments was '20-plus years'.¹¹³ At this point, Australia was 'well placed' and did have 'leading research':

We have two post-combustion capture pilot plants in operation at the moment in Australia. One in Victoria was the first one to capture CO₂ at an operating power station using the PCC technology last year. We have a second one at a New South Wales power station. Australia also has one of the leading sequestration trials being undertaken by the CO₂ CRC in the Otway Basin in Victoria. Those are major technologies.¹¹⁴

5.178 Although the various elements of CCS technology did exist, Dr Brockway noted that the major challenge for CCS was to combine these effectively and efficiently to work at the scale required.¹¹⁵

5.179 Mr James Cameron, a British expert, discussing the need for an alignment of public policy, finance and technology, advised the committee that there is:

...insufficient alignment between public policy incentives and private capital. For example, you cannot take provisions in....[the UK] budget to an investment committee and commit capital to carbon capture and storage. Much more work needs to be done to make that a realistic prospect for private capital flows.¹¹⁶

5.180 The committee heard some evidence on current CCS projects. InterGen advised:

Our assessment...is that carbon capture and storage is not commercially viable currently. I do not have the full details as to why [the ZeroGen CCS project is]...not continuing, but that would be a significant reason: the costs are currently prohibitive to moving forward.¹¹⁷

112 Dr John Brockway, CSIRO *Proof Committee Hansard*, 16 April 2009, p. 98.

113 Dr John Brockway, CSIRO *Proof Committee Hansard*, 16 April 2009, p. 99.

114 Dr John Brockway, CSIRO *Proof Committee Hansard*, 16 April 2009, p. 100.

115 Dr John Brockway, CSIRO, *Proof Committee Hansard*, 16 April 2009, pp 100-1.

116 Mr James Cameron, Climate Change Capital (UK), *Proof Committee Hansard*, 30 April 2009, p. 3.

117 Mr Brent Gunther, Managing Director, InterGen, *Proof Committee Hansard*, 30 April 2009, p. 86.

5.181 They considered that the project would be unable to continue without 'significant subsidy, ongoing voluntary subsidies or government subsidies'.¹¹⁸

5.182 International Power Australia, advised:

...we competed for part of the low emission technology fund that was set up around 2005-06...Part of the bid that we put together included a pilot carbon capture plant, a state-of-the-art facility, to be built at Hazelwood Power Station. I am delighted to say that is about to be opened at the end of next month.¹¹⁹

5.183 The company estimated that the plant could be operating at commercial scale within '15 to 20 years'.¹²⁰

The committee view

5.184 The committee notes that carbon capture and storage technology may hold potential as a possible means of future mitigation. Whilst many technologies are promising, it does not seem likely that these options are likely to play a significant role in the short term. The committee encourages further research and development in this area.

118 Mr Brent Gunther, Managing Director, InterGen, *Proof Committee Hansard*, 30 April 2009, p. 86.

119 Mr Tony Concannon, Director, International Power Australia, *Proof Committee Hansard*, 30 April 2009, p. 86.

120 *Proof Committee Hansard*, 30 April 2009, p. 86.