The Senate

Select Committee on Climate Policy

Report

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Senate Select Committee on Climate Policy

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RECOMMENDATIONS

Recommendation 1

2.120 The committee notes that the Treasury modelling was conducted in economic circumstances that were markedly different to those in which the legislation is proposed to now be introduced. Since the modelling was conducted the global financial crisis has led to a marked deterioration in the short-term economic outlook.

Whilst the CPRS package has been revised on two occasions, the modelling continues to fail to take into account the impact of these changed economic circumstances. The committee considers the modelling undertaken by Treasury to be inadequate and recommends that the Government direct Treasury to undertake further modelling. The further modelling should:

- **consider in detail the short-term adjustment costs;**
- **respond to criticisms made of Treasury's initial modelling including:**

- **taking into account the deterioration of the Australian economy**
- **the likely effect of the CPRS upon jobs and upon the environment**
- **the absence of any modelling of the impact of the CPRS on regional Australia; and**

- **model other types of schemes that have been proposed as alternatives to CPRS, including:**

- **a conventional baseline-and-credit scheme**
- **an intensity model**
- **a carbon tax**
- **a consumption-based carbon tax, and**
- **the McKibbin hybrid approach.**

Recommendation 2

4.41 The committee recommends that the CPRS legislation not be passed in its current form.

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.

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 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.**

Recommendation 7

6.64 The committee recommends the Government review the impact of the CPRS to avoid the EITE provisions generating perverse outcomes for the agriculture sector and the food processing and manufacturing sector such as scaling down and splitting operations.

Recommendation 8

6.68 The committee recommends that, as a priority, the Government develop complementary policy measures for greenhouse gas abatement and mitigation in the agricultural sector; and that such policy measures be underpinned by substantially greater research and development in this area.

Recommendation 9

6.69 The committee recommends that the Government establish an agriculture and land use policy taskforce to accelerate the development of complementary climate change policy measures for the land use sector; and to promote full carbon accounting in land use, agriculture and forestry sectors in international climate change fora.

Recommendation 10

6.105 The committee recommends that the Government promote the testing, development and roll-out of environmental restoration and land stewardship schemes, giving priority to schemes that can make a significant contribution to emissions reductions, agricultural productivity and biodiversity conservation.

Recommendation 11

6.139 The committee recommends that the Government promote the testing, development and roll-out of soil carbon technologies and schemes, giving priority to schemes that can make a significant contribution to emissions reductions and soil health.

Recommendation 12

6.164 The committee recommends that the Government takes steps to ensure that Australia encourages reform of international carbon accounting rules.

Recommendation 13

6.165 The Committee recommends that the Government provide greater funding so that recommendations 8, 9, 10, 11 and 12 can be implemented in a timely manner.

Chapter 1
Introduction

Terms of reference

1.1 This report sets out the findings of the inquiry by the Select Committee on Climate Policy into:

(a) the choice of emissions trading as the central policy to reduce Australia's carbon pollution, taking into account the need to:

(i) reduce carbon pollution at the lowest economic cost,

(ii) put in place long-term incentives for investment in clean energy and low-emission technology, and

(iii) contribute to a global solution to climate change;

(b) the relative contributions to overall emission reduction targets from complementary measures such as renewable energy feed-in laws, energy efficiency and the protection or development of terrestrial carbon stores such as native forests and soils;

(c) whether the Government's Carbon Pollution Reduction Scheme is environmentally effective, in particular with regard to the adequacy or otherwise of the Government's 2020 and 2050 greenhouse gas emission reduction targets in avoiding dangerous climate change;

(d) an appropriate mechanism for determining what a fair and equitable contribution to the global emission reduction effort would be;

(e) whether the design of the proposed scheme will send appropriate investment signals for green collar jobs, research and development, and the manufacturing and service industries, taking into account permit allocation, leakage, compensation mechanisms and additionality issues; and

(f) any related matter.

The conduct of the inquiry

1.2 The Senate created the Committee on 11 March 2009 to report by 14 May 2009.

1.3 The inquiry was advertised in the national press and details of the inquiry were placed on the Committee's website. The Committee invited submissions from a wide range of interested organisations, government departments and individuals and continued to accept submissions throughout the inquiry. The submissions are listed in Appendix 1, and are available on the committee's website. The Committee expresses its gratitude to all those who made submissions.

1.4 Public hearings were held in Canberra (15, 16 and 30 April and 1 May), Perth (20 April), Sydney (21 April), Melbourne (22 April), Hobart (23 April) and Brisbane

(28 April). Some witnesses from other locations, such as Mount Isa, Gladstone and Newcastle, were heard via teleconference. In total over 200 witnesses appeared before the Committee. A list of witnesses is found at Appendix 2. The Committee thanks these witnesses and apologises to the many aspiring witnesses that could not be fitted into the programme.

1.5 The Committee believes that the conduct of this inquiry has had an influence on, and makes a contribution to, the debate on this important issue.

1.6 In the week before the Committee's report was due to be tabled, and after the scheduled public hearings had been completed, the Government announced modifications to its Carbon Pollution Reduction Scheme. These including delaying the start date, increasing the conditional target for emissions reductions, increasing assistance to some companies and recognising some household contributions to reducing emissions.

1.7 So that consideration of these changes could be reflected in the Committee's report, the Committee requested an extension of its reporting date. The Senate agreed to extend the reporting date to 15 June 2009. The Committee then held an additional public hearing, in Canberra, on 20 May, to discuss the impact of the proposed changes to the CPRS.

Structure of the report

1.8 The Report is structured as follows:

(a) Chapter 2 sets out the evidence given to the Committee concerning the cause and extent of climate change and the extent to which climate change is a consequence of anthropogenic behaviour. It includes evidence from witnesses about:

(i) potential ethical and moral dimensions;

(ii) a global response to climate change; and

(iii) economic modelling.

(b) Chapter 3 considers the various policy options to reduce greenhouse gas emissions.

(c) Chapter 4 considers the effectiveness of the proposed CPRS as an emissions trading scheme. It notes that the model adopted by the Government is a cap and trade production-based emissions trading scheme.

(d) Chapter 5 considers complementary measures to address mitigating climate change.

(e) Chapter 6 considers agriculture and land use issues including the treatment of agriculture, the role of both native and planted forests, and biosequestration. There was broad agreement within the Committee that more work needed to be done on these issues, and that in particular there may need to be improvements to the current 'carbon accounting' treatment.

Chapter 2

Science and emissions targets

2.1 There are essentially three stages in setting appropriate targets for Australia's greenhouse gas emissions targets, drawing on different disciplines. The first stage is examination of the relevant science to learn the relationship between alternative levels of greenhouse gas concentrations in the atmosphere and the associated probability of temperature increases and their likely consequences. The second stage is to use these data to form a view about the desirable limits to place on global greenhouse emissions. This process will be informed by economics but is largely a matter of ethical or moral considerations concerning what is a 'just' distribution of costs between current and future generations. The third stage is to translate global emissions targets into conditional and unconditional targets for Australian emissions. This introduces considerations of national and international politics and strategic bargaining.

Climate science

2.2 When concerns emerged in the scientific community that increased emissions of greenhouse gases might be leading to global warming which if unchecked could lead to dangerous climate change, the Intergovernmental Panel on Climate Change (IPCC) was established to assemble and assess the best peer-reviewed science on the topic from a range of relevant disciplines. Its reports have been endorsed by the world's leading academies of science. Most scientists submitting to the committee and appearing before it broadly endorsed the findings of its 2007 report that warming of the climate system is unequivocal;[1] and gave evidence, with a very high confidence that the increase in global average temperature since the mid-20th century is due to anthropogenic greenhouse gas concentrations.[2] A brief account of the science follows.

The greenhouse effect

2.3 There are a number of 'greenhouse gases'. The most important is carbon dioxide (CO_2). The others listed under the Kyoto Protocol are methane, nitrous oxide, sulphur hexafluoride, hydroflurocarbons and perflurocarbons. To express levels of the various gases as a single number, they are often converted to carbon dioxide equivalents (CO_2e), where the conversion factors reflect the warming potential of the various gases.

2.4 The 'greenhouse effect' involves the sun's light energy travelling through the Earth's atmosphere to reach the planet's surface, where some of it is converted to heat energy. Most of that energy is re-radiated towards space—however, some is

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1 IPCC 2007, *Climate Change 2007: The Physical Science Basis*, p. 5.

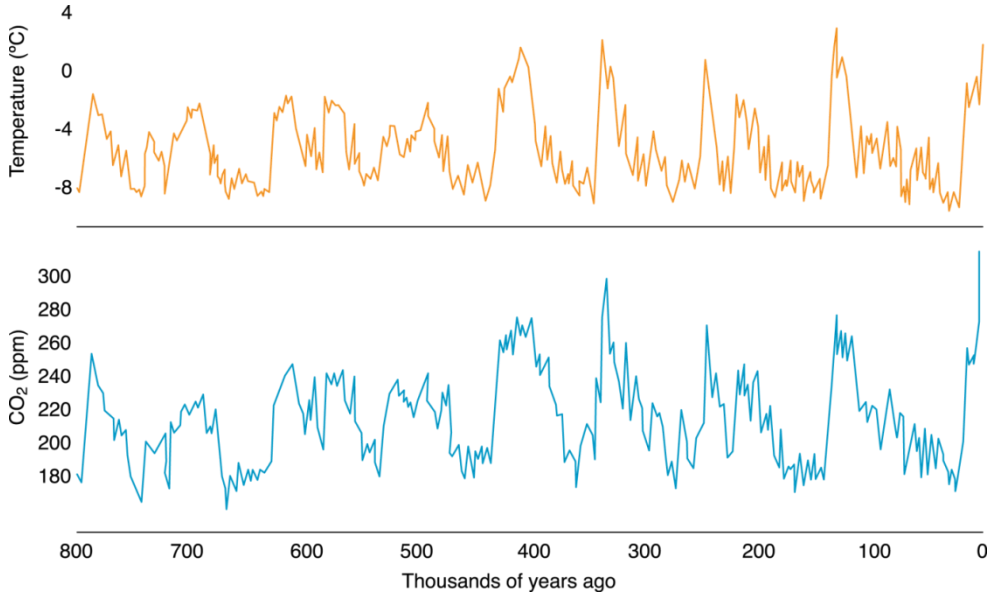
2 IPCC 2007, *Climate Change 2007: The Physical Science Basis*, p. 10. A more recent metastudy by Rosenzweig et al in the leading journal *Nature*, 15 May 2008, provides a range of further evidence of anthropogenic climate change.

re-re-radiated back towards the ground by the greenhouse gases in the Earth's atmosphere. Like a greenhouse, this keeps temperatures higher than they would otherwise be. The effect has operated for millions of years.

2.5 Human activities such as burning fossil fuels (coal, oil, natural gas), agriculture and land clearing release large quantities of greenhouse gases into the atmosphere, which trap more heat and further raise the Earth's surface temperature.

2.6 The relationship between atmospheric concentrations of CO_2 and temperature over time is shown in Chart 2.1. There are two important points to note from the chart. Firstly, there is a clear long-run correlation between CO_2 and temperature. This reflects a two-way mutually reinforcing causation; an exogenous factor, such as variations in the Earth's orbit around the Sun, that changes temperature will lead to a change in CO_2, and a change in CO_2 will lead to changes in temperature.

Chart 2.1: Atmospheric concentration of CO_2 and temperature (deviation from recent)



Source: CSIRO, 'Climate change: the latest science', 2009.

2.7 Professor Robert Carter of James Cook University claimed that temperature rises always preceded rises in CO_2 concentrations.[3] However, Professor Will Steffen, Executive Director of the Climate Change Institute at the Australian National University, explained that the record also includes times when greenhouse gas concentration increases preceded temperature rises.[4]

2.8 The second point to note from Chart 2.1 is that, over the 800,000 years shown, the atmospheric concentration of CO_2 varied in a range from around 180 to 280 parts per million (ppm) until the industrial revolution. It has now risen to 380 ppm.

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3 Professor Robert Carter, *Proof Committee Hansard*, 15 April 2009, pp 68 and 70.

4 Professor Will Steffen, *Proof Committee Hansard*, 15 April 2009, p. 83.

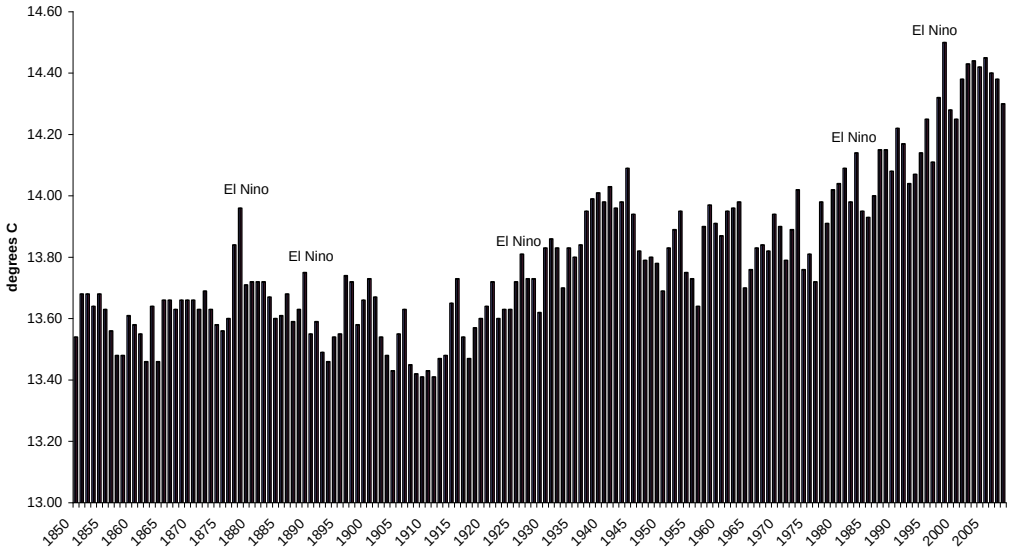
Global warming

2.9 Since modern measurements began in the late 1800s, global average surface temperature has increased by around 0.7ºC–0.8ºC. Tree rings and other records tell us that average Northern Hemisphere temperatures are likely to have been the highest in at least the past 1300 years. The 13 hottest years since the mid-19th century have all occurred in the past 14 years.

2.10 Global average annual temperatures from 1850 to the present are shown in Chart 2.2. While there is a clear uptrend trend in the temperature data there is volatility from year to year, reflecting factors such as volcanic eruptions and the El Nino effect.

Chart 2.2

Global temperature 1850-2008



Source: calculated from data from Bureau of Meteorology.

2.11 Some scientists place great emphasis on the average global temperature in 2008 being lower than in 1998. Professor Bob Carter of James Cook University interpreted this as indicating 'there is no warming at all, there is cooling'.[5] However the climate scientists pointed out that 1998 was an outlying El Nino year (Chart 2.2) and that 2008 was still hotter than any year prior to 1990.[6] Professor Steffen, added that the less volatile ocean temperatures show a clear warming trend.[7]

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5 Professor Bob Carter, *Proof Committee Hansard*, 15 April 2009, p. 59.

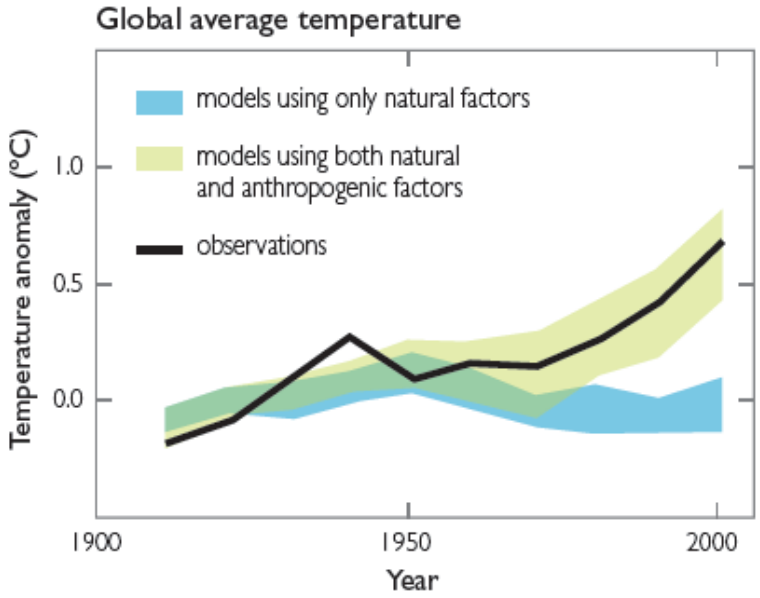
6 Professor David Karoly, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 82.

7 Professor Will Steffen, *Proof Committee Hansard*, 15 April 2009, p. 82.

2.12 Media reports claim that an expansion of the ice area in part of Antarctica provides evidence of global cooling. Dr Ian Allison, of the Australian Antarctic Division in the Department of the Environment, Water, Heritage and the Arts, explained that wind changes were spreading a decreasing volume of ice over a wider area. He also drew attention to the localised impact of the hole in the ozone layer, which until the reduction in use of CFCs allows its repair, is likely to result in temperatures in some parts of Antarctica being warmer than would otherwise be the case.[8]

2.13 It was put to the committee by Associate Professor Stewart Franks of the University of Newcastle that any warming in the 20th century was due to natural factors.[9] However, as Chart 2.3 illustrates, climate models relying on natural factors could not explain the warming in the 20th century but models that incorporated increased greenhouse gas emissions from human activities could do so.[10]

Chart 2.3: Modelling temperature increases



Source: CSIRO, *The science of climate change*.

2.14 In a 'business as usual' world the IPCC's median estimate is that average temperatures will rise four degrees by 2100.[11] Four degrees may not sound a lot.

8 Dr Ian Allison and Dr Tony Press, *Proof Committee Hansard*, 23 April 2009, pp 11–13.

9 Professor Stewart Franks, *Proof Committee Hansard*, 15 April 2009, p. 59 and Mr Ian McClintock, *Submission 7*, p. 2.

10 Professor David Karoly, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 90. The CSIRO comment 'there is less than 5% likelihood that the observed warming is due to natural causes alone'; *The science of climate change*.

11 Cited in *Carbon Pollution Reduction Scheme: Australia's Low Pollution Future*, December 2008, (hereafter *White Paper*), pp 1-2.

However, as Chart 2.1 shows, five degrees is the difference between now and the last ice age.

Implications for Australia

2.15 The IPCC has predicted with high confidence that without mitigation, by 2100 a temperature rise of over four degrees in Australia would lead to water security problems, and risks to coastal development and population growth from sea-level rise and increases in the severity and frequency of storms. It predicts with very high confidence that Australia would suffer a significant loss of biodiversity in such ecologically rich places as the Great Barrier Reef and the Queensland Wet Tropics, as well as the Kakadu wetlands, south-west Australia, the sub-Antarctic islands and alpine areas. The IPCC predicts with high confidence a decline in production from agriculture and forestry by 2030 over much of southern and eastern Australia due to increased drought and fire.[12]

2.16 The effects of climate change also carry national security implications:

> …the cumulative impact of rising temperatures, sea levels and more mega droughts on agriculture, fresh water and energy could threaten the security of states in Australia's neighbourhood by reducing their carrying capacity below a minimum threshold, thereby undermining the legitimacy and response capabilities of their governments and jeopardising the security of their citizens. Where climate change coincides with other transnational challenges to security, such as terrorism or pandemic diseases, or adds to pre-existing ethnic and social tensions, then the impact will be magnified.[13]

More recent scientific observations

2.17 More recent evidence suggests that the 2007 IPCC report may prove optimistic:

> …the recent climate change congress in Copenhagen where we had about 2,500 researchers from around the world [indicated]…We have good evidence that shows that the climate system is tracking at the upper level of the IPCC projections…In keeping with that, temperature and sea levels are also tracking at or near those upper levels of projections.[14]

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12 IPCC 2007, *Impacts, adaptation and vulnerability*, p. 509.

13 Dr Alan Dupont & Dr Graeme Pearman, 'Heating up the planet: Climate change and security', *Lowy Paper*, no. 12, Lowy Institute for International Policy, 2006, cited in *White Paper* pp 1-2.

14 Professor Will Steffen, *Proof Committee Hansard*, 15 April 2009, p. 76. Similar views were put by Dr Graeme Pearman, *Proof Committee Hansard*, 15 April 2009, p. 75 and Professor Tim Flannery, *Standing Committee on Economics Proof Committee Hansard*, 27 March 2009, p. 100.

Support for the views of climate scientists

2.18 The bulk of the evidence presented to the committee indicated that the overwhelming majority of scientists actively researching in the area broadly support the conclusions of the IPCC.[15] As one witness pointed out:

> All of the major national academies of science—from Australia, the US, the UK, Canada, Germany, India, Russia, China, Italy, Japan and so on—have declared that climate change is a major global threat.[16]

2.19 The committee heard that medical experts regard climate change as a major health issue:

> Last week one of the world's top medical journals, the *Lancet*, published a report after a year of cooperation with University College London, declaring that climate change was the greatest threat to global public health of the 21st century.[17]

2.20 The bulk of the thousands of submissions which the committee received from the public accept that climate change is happening and urge action.

2.21 Many of the large companies appearing before the committee (either directly or via industry organisations) employ many scientists, and would be in a position to express views about the science of climate change. It was notable that none questioned the science. Examples of statements made are:

> The Australian minerals sector is committed to being part of a comprehensive global response to prevent dangerous climate change.[18]

> We accept the general conclusion of the UK government's Stern report that the costs of not acting exceed the costs of acting to address climate change.[19]

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15 See for example Professor David Karoly, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, pp 81–82; Dr Tony Press, Chief Executive Officer, Antarctic Climate and Ecosystems Cooperative Research Centre, *Proof Committee Hansard*, 23 April 2009, p. 10 and Dr James Risbey, a CSIRO scientist and researcher at the centre for Australian Weather and Climate Research, speaking in a private capacity, *Proof Committee Hansard*, 23 April 2009, p. 64.

16 Dr Brett Parris, World Vision Australia, *Proof Committee Hansard*, 20 May 2009, p. 110. The joint statement by the academies, led by the Royal Society, can be found in *Science*, 18 May 2001, p. 1261.

17 Dr Brett Parris, World Vision Australia, *Proof Committee Hansard*, 20 May 2009, p. 110. The article, which can be found in *The Lancet*, 16 May 2009, p. 1693, says that 'effects of climate change on health will affect most populations in the next decades and put the lives and wellbeing of billions of people at increased risk'. Further evidence on medical implications is given by Doctors for the Environment, *Submission 401*.

18 Mr Peter Coates, Chairman of Xstrata and Chairman of the Minerals Council of Australia Standing Committee on Climate Change, *Proof Committee Hansard*, 22 April 2009, p. 22.

19 Mrs Heather Ridout, Chief Executive, Australian Industry Group, *Proof Committee Hansard*, 22 April 2009, p. 32.

> I have not heard of anyone within our business or most other businesses who is against an emissions trading scheme. The end point is agreed by business.[20]
>
> Rio Tinto supports effective, coordinated action by governments to reduce greenhouse gas emissions…[21]

2.22 Support was also provided by farmers' organisations:

> The Western Australian Farmers Association recognises the reality of climate change…95 per cent of the climate scientists tell us that humans are causing it and that we have to do something about it.[22]

Greenhouse gas concentrations and future temperatures

2.23 The *Garnaut Review* concluded that stabilisation of greenhouse gas concentrations at 450 ppm was in Australia's interests. As concentrations are now around this level, stabilisation will require significant falls in emissions starting very soon and then reversing some overshooting.

2.24 Most of the scientists assembled by the committee supported the consensus of global science that 450 ppm was the highest acceptable stabilisation level.

> Just about everyone on the panel has been saying that achieving a 450 stabilisation by 2050 will give us a 50 per cent probability of keeping within two degrees…[23]
>
> Dangerous climate change is generally thought to start when the global average temperature has risen by about two degrees above what it was in pre-industrial times. In addition, it is generally thought that stabilisation of greenhouse gases in the atmosphere at a 450 parts per million CO_2 equivalent will give rise to a global temperature rise of about two degrees centigrade above that of pre-industrial times.[24]

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20 Mr Anthony Concannon, Chairman, Energy Supply Association of Australia, *Proof Committee Hansard*, 28 April 2009, p. 42.

21 Mr Steve Hodgson, President and Chief Executive Officer, Bauxite and Alumina, Rio Tinto Alcan, *Proof Committee Hansard*, 28 April 2009, p. 126. Similar sentiments were expressed by Mr Miles Prosser, Executive Director, Australian Aluminium Council, *Proof Committee Hansard*, 1 May 2009, p. 51.

22 Mr Mike Norton, President, and Mr Dale Park, Climate Change Spokesperson, Western Australian Farmers Federation, *Proof Committee Hansard*, 20 April 2009, pp 95 and 99. A similar view was put by Mr Nick Flittner, Tasmanian Farmers and Graziers Association, *Proof Committee Hansard*, 23 April 2009, p. 19.

23 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 89.

24 Dr John Hunter, Antarctic Climate and Ecosystems Cooperative Research Centre, *Proof Committee Hansard*, 23 April 2009, p. 3.

2.25 Aiming at 550 ppm CO_2e would lead to much greater risks:

> …if you stabilise at a 550 parts per million carbon dioxide equivalent, there is about a 50 per cent chance of Greenland going into this phase of what could be irreversible melting…If that does shrink significantly, the potential sea-level rise will be about seven metres.[25]

2.26 There are also scientists who regard the risks of settling for stabilising at 450 ppm as greater than this. Dr Risbey, a CSIRO (Commonwealth Scientific and Industrial Research Organisation) scientist and researcher at the centre for Australian Weather and Climate Research, warned:

> At 450 parts per million there is a 50 to 90 per cent chance of exceeding the dangerous threshold of two degrees Celsius…where if we look back to previous times in earth's history, we see the ice sheets in Greenland and West Antarctic would break down or start to break down. The worry is that we get to a point where that breakdown is irreversible…The last time the temperature was two degrees Celsius warmer than at present,…was about 130,000 years ago. That was in the peak of the last major interglacial period. At that time sea level was about five metres higher than present levels…[450 ppm] also gives us about a 10 to 25 per cent probability of exceeding three degrees,…The last time temperature was three degrees warmer than the present temperature was about three million years ago, in the Pliocene where sea level was about 25 metres higher than at present.[26]

2.27 Experts also expressed concern that increasing CO_2 was leading to ocean acidification, which would disrupt the marine food chain by preventing some organisms forming shells.[27]

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25 Dr John Hunter, Antarctic Climate and Ecosystems Cooperative Research Centre, *Proof Committee Hansard*, 23 April 2009, p. 4.

26 Dr James Risbey, speaking in a private capacity, 23 April 2009, pp 58–59.

27 Dr Martin Riddle, Australian Antarctic Division, *Proof Committee Hansard*, 23 April 2009, pp 7 and 9. Similar views were put by Dr Risbey, *Proof Committee Hansard*, 23 April 2009, p. 59 and Dr Matear, *Proof Committee Hansard*, 23 April 2009, pp 61–62. Some scientists did not dispute this, but downplayed its significance: 'we are not talking about the end of the planet'; Professor Franks, *Proof Committee Hansard*, 15 April 2009, p. 71.

Ethical and moral dimensions

2.28 The scientific evidence that taking no action is likely to lead to a rise in temperatures with serious adverse consequences for future generations is not alone a case for action if there are some short-term costs to action. The *Stern Review* was faced with this issue and captured the essence of the argument:

> …if you care little about future generations you will care little about climate change, As we have agued that is not a position which has much foundation in ethics…[28]

2.29 The key question is how policymakers should value the welfare of future generations. If political leaders are meant to follow 'the will of the people', or act 'in the public interest', does this include future generations who have no vote? A related question is the extent to which policymakers in wealthy countries should be concerned with the welfare of those in poor countries.

2.30 Professor Glenn Albrecht, an environmental philosopher from Murdoch University, argued:

> …it is ethically repugnant to force on innocent and non-consenting communities, particularly obviously our children and all future children, a deliberate decision to increase greenhouse gas emissions or a calculated failure to reduce them to safe levels. We must do the right thing to avoid imposing a massive and potentially irreversible risk on them. The idea of irreversibility is something that our ethical systems have not had to deal with in the past…. The science is more than sufficient to deliver an ethical response based on risk minimisation. The issue of irreversible change to the global climate is not one that humans can dismiss with scepticism or inaction and Australia's obligation as a relatively rich, very wealthy, industrialised and well educated country is to take the lead on greenhouse gas reductions and to set standards that will deliver a safe and predictable world to future generations.[29]

2.31 An eloquent and moving exposition was provided by Reverend Tim Costello, Chief Executive Officer of World Vision Australia:

> …climate change is no longer [just] an environmental issue; it is now a humanitarian and a development issue. It is starting to cost lives, and it will cost many, many more lives… The burden of climate change is going to fall on the poorest in our own society through higher costs and impact globally on the poorest nations, which is why World Vision is involved in this issue. It literally threatens to undo 50 years of development work.

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28 *The Economics of Climate Change: the Stern Review*, Cambridge University Press, 2007, p. 54. In its more technical analysis, the Stern team applied a discount of 0.1 per cent a year to the welfare of future generations, solely on the grounds that some global catastrophe (such as collision with an asteroid) may mean they do not exist.

29 Professor Albrecht, *Proof Committee Hansard*, 20 April 2009, pp 70–71.

> We work with Abdul Mannan, who is 55. He is an elder of the Dalalkandi on the island of Bhola in Bangladesh. That island has a population of 2,200. He speaks for many in his community when he says: 'The place where I was born lies five kilometres out in the sea. I have already moved my home and family four times; this is my fifth house. Soon I will have to move again.' I have personally seen and listened to these stories…Bangladesh is one of the poorest and most low-lying coastal areas on earth. Bhola, its biggest island, is eroding at a phenomenal rate. From a size of 6,400 square kilometres in the 1960s, it is now half its original size. At this rate the entire island of Bhola will be lost in the next 40 years. So what will become of Bhola's two million islanders? Many will be refugees.
>
> …as a child-focused development agency, we are very concerned about the intergenerational equity of children here and overseas…We in Australia are enjoying the fruits of our forebears' thought and work, we have gratitude for their mobilisation, their sacrifice that saved us from fascism, and we look forward to our children's future. But I do not think they will regard our conduct as fair, looking back, if as a generation they see us as a selfish generation that left them with problems with no viable solution.[30]

2.32 Reverend Costello's point about the impact on the younger and future generations was echoed by younger witnesses who appeared before the committee:

> The terrible irony of climate change is that those who will be most affected are the ones that have contributed the least. Also, those who will be the most affected by climate change have the least ability, at the present time, to contribute to the decision making and have been consistently left out of the decision-making processes…Climate change is not a political issue. It is a human issue. It is about Anna's grandparents farm in Gunnedah. It is about the tourism operators up on the Great Barrier Reef and in Kakadu. It is about the victims of natural disasters all over Australia. It is about our neighbours in the Pacific that are threatened with their whole homes, livelihoods and cultures disappearing under the ocean, and about our Torres Strait that may well go the same way. It is about all we value in Australia and what we imagine as the cultural icons. It is about our beaches and the heritage that we want to leave to our children.[31]

30 Reverend Tim Costello, *Proof Committee Hansard*, 22 April 2009, pp. 79–80.

31 Ms Amanda McKenzie, Australian Youth Climate Coalition, *Proof Committee Hansard*, 30 April 2009, pp 34–35.

The economics of global climate change

2.33 The *Stern Review* compared the short-term costs of taking action to reduce global greenhouse gas emissions with the long-term costs of allowing climate change to take its course.

2.34 Its conclusion was that there was a clear case for action:

> Using the results from formal economic models, the review estimates that if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more.
>
> In contrast, the costs of action – reducing greenhouse gas emissions to avoid the worst impacts of climate change – can be limited to around 1% of global GDP each year. [32]

2.35 The *Garnaut Review* looked at similar issues from an Australian perspective. It concluded:

> Mitigation on the basis of 550 [ppm atmospheric concentration of CO_2e] objectives was judged to generate benefits that exceeded the costs. Mitigation on the basis of 450 was thought to generate larger net benefits than 550.[33]

Committee view on risk management

2.36 The balance of the evidence discussed above suggests that climate change is occurring, is driven by anthropogenic factors and is a grave threat to accustomed ways of life and natural systems. If this view is right, the calculations above make a virtually unarguable case for taking global action.

2.37 The IPCC makes clear that there is a range of uncertainty around the projections. But this is not an excuse for inaction.[34] Prudent risk management would balance the risk of doing nothing when the climate scientists are right—which would involve very severe and irreversible damage to human welfare—against the outcome if action is taken unnecessarily, which would modestly lower economic growth in the short term but mean that remaining fossil fuel supplies would last longer.

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32 *The Economics of Climate Change: the Stern Review*, Cambridge University Press, 2007, p. xv.

33 The *Garnaut Climate Change Review: Final Report*, Cambridge University Press, 2008, (hereafter *Garnaut Review*), p. xxv. Further information on the modelling results in the *Garnaut Review* is given below, starting in paragraph 2.120.

34 This point is made in a recent literature survey by the OECD, which noted the uncertainties but argued action was justified 'even if the marginal cost of greenhouse gas emissions mitigation exceeds the marginal damage of one additional ton of carbon…because two features of the impacts of climate change tilt the balance in favour of action: their irreversibility, and the risk they are extreme'; S Jamet and J Corfee-Morlot, 'Assessing the impact of climate change: a literature review', *OECD Economics working papers*, no. 691, April 2009.

2.38 Even acknowledging the possibility that the majority view on the science could be totally wrong still leaves a powerful case for a 'no regrets' policy. Taking action amounts to 'giving the planet the benefit of the doubt'. It is a sensible insurance policy.

Australia's fair and equitable share of global emissions targets

2.39 Prime Minister Kevin Rudd in an address to the international climate conference in Bali in 2007, said:

> Climate change is the defining challenge of our generation…one of the greatest moral, economic and environmental challenges of our age.

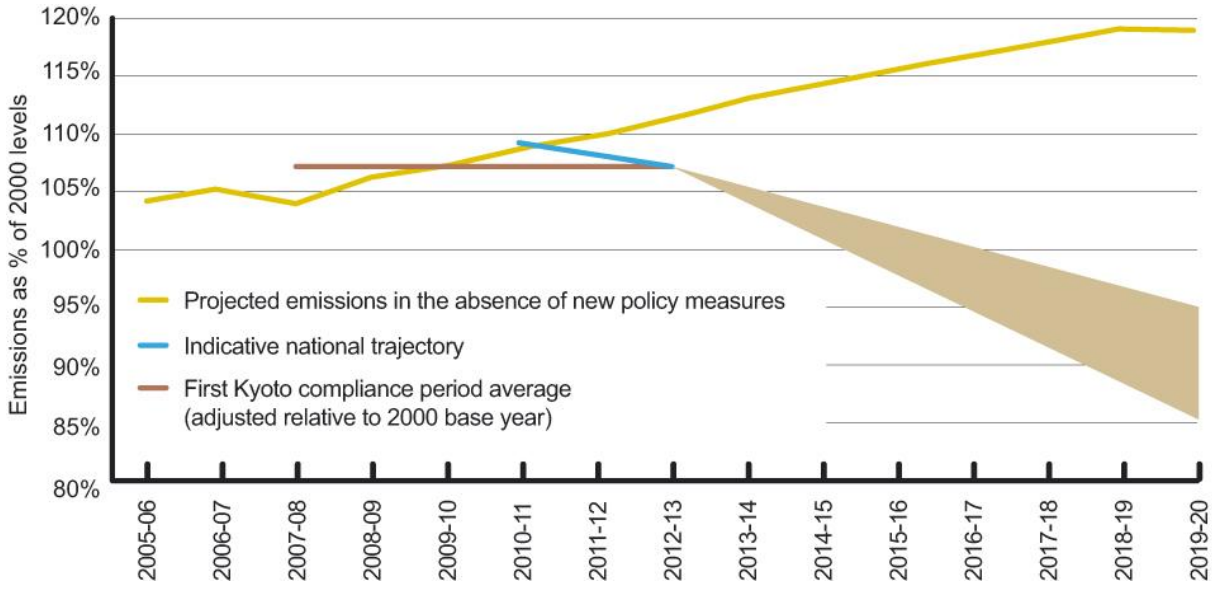
2.40 The Government says that Australia's emissions targets are set with regard to:

> the principle that the stabilisation of atmospheric concentrations of greenhouse gases at around 450 parts per million of carbon dioxide equivalence or lower is in Australia's national interest.[35]

The Government's unconditional offer

2.41 The *White Paper* envisaged an unconditional offer of a reduction of 5 per cent in carbon emissions from 2000 to 2020. A path consistent with this would see Australian emissions reducing from 109 per cent of 2000 levels in 2010–11 to 108 per cent in 2011–12, and 107 per cent in 2012–13 (Chart 2.4).

Chart 2.4: CPRS targets



Source: *White Paper*, p 4-23.

35 *Carbon Pollution Reduction Scheme Bill 2009,* (hereafter *CPRS Bill*), section 14(5)(c)(i).

The Government's original conditional offer

2.42 The Government had stated it would go to 15 per cent if there were a global agreement 'where all major economies commit to substantially restrain emissions and all developed countries take on comparable reductions to that of Australia'.[36]

The Government's revised conditional offer

2.43 The Government announced on 4 May that it was raising the conditional offer it was taking to Copenhagen to a 25 per cent reduction. It explained:

> The Government's new commitment of 25 per cent below 2000 levels by 2020 follows extensive consultation with environment advocates on the best way to maximise Australia's contribution to an ambitious global outcome. It also reflects that international developments since December 2008 have improved prospects for such an agreement.[37]

2.44 The proposed Australian offer is subject to strict conditions. The main condition is that there must be an international agreement capable of stabilising greenhouse gases at 450 ppm or lower by mid-century. The detailed conditions are quite specific:

> 1. comprehensive coverage of gases, sources and sectors, with inclusion of forests (e.g. Reducing Emissions from Deforestation and forest Degradation - REDD) and the land sector (including soil carbon initiatives (e.g. bio char) if scientifically demonstrated) in the agreement;
>
> 2. a clear global trajectory, where the sum of all economies' commitments is consistent with 450 ppm CO_2-e or lower, and with a nominated early deadline year for peak global emissions no later than 2020;
>
> 3. advanced economy reductions, in aggregate, of at least 25 per cent below 1990 levels by 2020;
>
> 4. major developing economy commitments to slow growth and then reduce their absolute level of emissions over time, with a collective reduction of at least 20 per cent below business-as-usual by 2020 and a nominated peak year for individual major developing economies;
>
> 5. global action which mobilises greater financial resources, including from major developing economies, and results in fully functional global carbon markets.[38]

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36 *CPRS Bill Commentary*, p. 14.

37 Department of Climate Change, fact sheet, *Strengthening Australia's 2020 carbon pollution target*, p. 1. The *Garnaut Review* had also advocated a 5 per cent unconditional cut but recommended an offer of a 25 per cent cut in the context of an international agreement that added up to sufficient cuts to reach a CO_2 concentration of 450 ppm.

38 Department of Climate Change Fact Sheet, *Strengthening Australia's 2020 Carbon Pollution Target*, p. 1.

2.45 The Department of Climate Change was asked to clarify what was meant by 'fully functioning carbon markets' and replied:

> Operationally, it has really meant that Australia would have access to a broad range of international trading mechanisms. We are not talking about how every country has to be participating in a particular market; it is just that there is a deep and liquid market available. That may not require enormous enhancements, other than the CDM market expanding access to, for example, European markets et cetera.[39]

2.46 Views differed among witnesses as to whether the conditions were realistic:

> There has been comment around the conditions that have been set on the 25 per cent target from the government, but in our view they are a realistic expression of the kind of agreement which would get us to that 450 ppm.[40]
>
> I think that the 25 per cent target is still very low and the contingencies associated with it are problematic…[41]
>
> …some of those criteria are not helpful, and that the government should consider revising them.[42]
>
> …the conditions are too stringent.[43]

2.47 Australia's offer is compared to that of other economies in Table 2.1. Comparing different countries' plans is complicated as they refer to different base years. For example, the US 2009 Budget proposes a 14 per cent reduction in emissions by 2020 but, as this is from 2005 levels, it represents only about a return to 1990 levels. Table 1 attempts to express the various plans on a common 1990 base. It uses United Nations population projections to express the targets in per capita terms; in some cases (including Australia) these projections differ from those of national governments. Another reason the table should only be regarded as indicative rather than definitive is that different sources give differing estimates of historical emissions.

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39 Mr Blair Comley, Department of Climate Change, *Proof Committee Hansard*, 20 May 2009, p. 4.

40 Mr John Connor, Climate Institute, *Proof Committee Hansard*, 20 May 2009, p. 27.

41 Dr Richard Denniss, Australia Institute, *Proof Committee Hansard*, 20 May 2009, p. 42.

42 Professor Stephen Howes, *Proof Committee Hansard*, 20 May 2009, p. 58.

43 Dr Brett Parris, World Vision Australia, *Proof Committee Hansard*, 20 May 2009, p. 111.

Table 2.1: Comparison of emission reduction targets for 2020

Targets and proposals	% change from 1990	% change from 1990 per capita	per capita emissions (tonnes of CO_2e)
Australia	-3 to -24	-30 to -45	15 to 12
European Union	-20 to -30	-25 to -34	8 to 7
United Kingdom	-34	-42	7
US (2009 budget proposal)	-1	-27	11
US (Waxman bill[44])	-4	-29	11
Canada (Government target)	+24	-8	12
Canada (House bill C-311[45])	-25	-44	7
Germany	-40	-41	9
Netherlands	-30	-39	8
Norway	-30	-43	4
Switzerland	-20 to -30	-32 to -40	4

Sources: Secretariat calculations based on *White Paper*, p 3-3; *Garnaut Report*, p 177; Department of Climate Change Fact Sheet – Emissions, target and global goal; 'Economic cost as an indicator for comparable effort'; 'A new era of responsibility: renewing America's promise' (US 2009 Budget), p 21; *UK Budget 2009: Building a low-carbon economy- implementing the Climate Change Act 2008*. Per capita percentage changes are calculated from the previous column based on population projections in United Nations, *World Population Prospects* and then the numbers in the final column calculated by applying these per capita percentage changes to 1990 per capita emissions (including land use change and forestry) from the United Nations Framework Convention on Climate Change; http://esa.un.org/unpp.

Arguments for 25 per cent or higher emissions reductions

2.48 As discussed above, the scientific evidence suggests that the global concentration of greenhouse gases needs to be kept to 450 ppm to avoid the dire consequences following from increases in average temperatures of over two degrees. The majority of submitters argued that Australia should therefore make an offer consistent with its fair share of a global effort to the world stabilising concentrations at 450 ppm. As Professor Garnaut says:

> …to make an unrealistically low offer in the international negotiations is to negate the prime purpose of our own mitigation, which is to facilitate the emergence of an effective agreement.[46]

44 The Waxman-Markey bill has been approved (by 33–25) by the House of Representatives Energy and Commerce Committee, and is now under consideration by other committees.

45 The bill has passed a second reading vote and is now before a parliamentary committee.

46 *Garnaut Review*, p. 278.

2.49 Australia currently has per capita emissions well above the global average and many submissions regard it as neither fair nor realistic to expect the world to accept this remaining the case forever.

2.50 The *Garnaut Review* assumes the world agrees to eliminate these differences in per capita emissions (or emissions entitlements) gradually over the period to 2050 (in a process know as 'contract and converge'). Under this arrangement, Professor Garnaut's calculation is that Australia's contribution would be about a 25 per cent reduction in emissions from 1990 levels.[47] This calculation was not challenged by any witness or submission.

2.51 This conditional target is still Professor Garnaut's preferred position:

> …the ETS…would be substantially better than nothing if the upper limit to emissions reductions were raised to 25 per cent of 2000 levels by 2020 on condition that other countries had made commitments that added up to an agreement to hold and to reduce greenhouse gas concentrations in the atmosphere to 450 parts per million.[48]

2.52 Whether there would be global agreement to this timetable for convergence has been questioned:

> I think the fairest way to do it would be along a contraction and convergence scenario where you converge at around 2030. I think 2050 is the sort of thing that the developing world is not going to accept.[49]
>
> So contraction and convergence models as proposed internationally for well over a decade and most recently by Professor Garnaut's review are going to be a key part of the debate. One of the issues, of course, is: when does convergence happen? When is a fair time at which we all arrive at some global per capita level of emissions? If you look at it as an entitlement issue with trading between larger emitters and lower emitters in the early stages, there is nothing to stop that happening in a very early phase. You do not need to wait until 2050 to do that, and we may see increasing global pressure for that to occur.[50]

2.53 Professor Garnaut's approach was endorsed by other witnesses:

> Everybody has to be in the boat, as Garnaut has said. But you cannot get people into the boat in our judgement unless…you have as your objective an equitable per capita policy that over time delivers some kind of social

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47 A similar calculation in a report by Ecofys gives a 22–28 per cent reduction as Australia's contribution; Dr Paul Twomey, *Standing Committee on Economics Proof Committee Hansard*, 27 March 2009, p. 116. This is also about a 25 per cent reduction from 2000 levels, as in Australia there was little net increase in emissions over 1990–2000.

48 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, p. 46.

49 Mr Andrew Macintosh, *Proof Committee Hansard*, 15 April 2009, p. 84.

50 Dr Iain MacGill, Joint Director (Engineering), Centre for Energy and Environmental Markets, University of New South Wales, *Proof Committee Hansard*, 1 May 2009, p. 63.

> equity in terms of per capita emissions. If not, you are in effect saying to people in India and elsewhere, 'Your job is to ride your bike and cook on cow dung for another 50 years while we enjoy getting around in the big cars.' We just think that is unsustainable.[51]

2.54 The logic of limiting the Australian offer to a maximum reduction of 15 per cent, as proposed in the *White Paper*, had been questioned by a number of witnesses, many of whom argued for the 25 per cent target the Government subsequently adopted:

> …we think it is absolutely critical that Australia puts on the table at least a 25 per cent target in the upper end of its range as part of a global effort so it signals that it is actually willing to play its fair share in an effective global agreement.[52]

> …it is terrific that the 25 per cent target is on the table—it means that Australia need not now go into negotiations as something of a wrecker…[53]

> The main problem with the CPRS is that the targets bear no relationship to the problem that is trying to be solved…the selection of targets in the CPRS is entirely disconnected from the scientific problem of reducing greenhouse gas emissions.[54]

> If you look at the ways some of the other countries such as China and India are positioning themselves, if we are taking a half-arsed approach in Australia it is going to make a global agreement that much harder.[55]

> …the stronger target of 25 per cent does move Australia into an international climate position that is reasonable to negotiate a successful outcome for an agreement for 450 ppm or less at the critical negotiations in Copenhagen later this year.[56]

> I think the biggest single problem with the CPRS as announced is that that conditional agreement—the amount we say we will do if everybody else joins in—is much below what we need to stabilise the climate. The Garnaut estimate of a 25 per cent reduction by 2020, I think, was at the very low end of the reduction that is needed.[57]

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51 Mr Michael O'Sullivan, Australian Council of Superannuation Investors, *Proof Committee Hansard*, 30 April 2009, p. 167.

52 Mr Erwin Jackson, Climate Institute, *Proof Committee Hansard*, 1 May 2009, p. 77.

53 Dr Brett Parris, World Vision Australia, *Proof Committee Hansard*, 20 May 2009, p. 111.

54 Dr Richard Denniss, Australia Institute, *Proof Committee Hansard*, 15 April 2009, p. 18.

55 Dr Phill Pullinger, Environment Tasmania, *Proof Committee Hansard*, 23 April 2009, p. 95.

56 Mr Owen Pascoe, Australian Conservation Foundation, *Proof Committee Hansard*, 20 May 2009, p. 26.

57 Professor John Quiggin, *Proof Committee Hansard*, 28 April 2009, p. 17.

2.55 The view of some eminent scientists is that more ambitious targets are required, in some cases because they interpret the latest scientific results as indicating that 450 ppm poses unacceptable risks:

> The best estimate for the level of global emission reductions is between 50 and 85 per cent global emission reductions based on the IPCC assessments by 2050 and an equal per capita approach globally would suggest 90 per cent to 97 per cent emissions reductions for Australia by 2050...if you want to achieve a 450 parts per million CO_2 stabilisation target. At 450 parts per million we still have a 50 per cent risk of exceeding two degrees of warming…In 2020 emission reductions for developed countries should be between 25 per cent and 40 per cent.[58]

> If you aim for a target of 450 parts per million, as we said in our submission that would require at least a 25 per cent 2020 target for Australia.[59]

> …there seems to be a disjunct in what has been put forward in the Government's *White Paper*. The Government emphasised in its *White Paper* that it would like to pursue a 450 parts per million CO_2-e outcome and it has put forward an emissions target range that seems to be inconsistent with achieving that ppm outcome. If the Government wants to achieve a 450 part million CO_2 outcome, the bare minimum to which Australia can commit is at least 30 per cent.[60]

2.56 These considerations led some environmentalists to regard even the 25 per cent offer as inadequate:

> If such a strong agreement were met then we think that Australia's contribution should be significantly higher than 25 per cent, probably in the order of 50 per cent reductions by 2020 if the global deal resulted in the conditions that have been stipulated by the government being met for a 25 per cent reduction.[61]

> …we really need domestic reduction targets of closer to 40 to 50 per cent by 2020 if we are going to make the contribution that is needed to meet that level of ambition that the climate science is saying we need.[62]

> The vision of young people is that they will be able to live in a climate that is somewhat similar to the one their parents and their grandparents lived in. The current targets…will not ensure this...Even at the upper range of the government's target, at 25 per cent, there is a 50 per cent chance of the

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58 Professor David Karoly, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 77.

59 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, p. 86.

60 Mr Andrew Macintosh, Associate Director, ANU Centre for Climate Law and Policy, *Proof Committee Hansard*, 15 April 2009, p. 74.

61 Mr John Hepburn, Greenpeace Australia, *Proof Committee Hansard*, 20 May 2009, p. 20.

62 Mr Lawson, Friends of the Earth Australia, *Proof Committee Hansard*, 20 May 2009, p. 23.

> temperature increase going above two degrees and having significantly adverse consequences for Australia.[63]

2.57 A study by McKinseys consultants concludes that a 30 per cent target would be easily affordable for Australia:

> A significant reduction in Australian GHG emissions is achievable—30 percent below 1990 levels by 2020 and 60 percent by 2030 without major technological breakthroughs or lifestyle changes. These reductions can be achieved using existing approaches and by deploying mature or rapidly developing technologies to improve the carbon efficiency of our economy. They require significant changes to the way we operate in key sectors, for example, changes in our power mix, but can be achieved without major impact on consumption patterns or quality of life. Reducing emissions is affordable—with an average annual gross cost of approximately A$290 per household to reduce emissions in 2020 to 30 percent below 1990 levels. This compares to an expected increase in annual household income of over A$20,000 in the same time period.[64]

2.58 Reverend Costello and Dr Pearman questioned the Government's (previous) conditional target on ethical grounds:

> It is not fair because the targets do not represent Australia taking its fair share of the burden, let alone taking leadership on the issue.[65]
>
> We are a relatively wealthy country and we cannot sit back and expect all countries to take an equal share in this. All of that together says to me that we should have a 30 per cent reduction by 2020.[66]

2.59 As noted above, while Australia 'only' emits 1½ per cent of global emissions, it is one of the world's highest *per capita* emitters. Furthermore, these calculations only include emissions in Australia. If Australia were regarded as 'responsible' for the emissions when our exports are used, on the grounds that we are benefiting from these emissions, Australia would be regarded as an even higher emitter. World Vision Australia provided an example of these calculations to bolster the case for Australia adopting a stricter target:

> With respect to our coal exports alone, we exported 252 million tonnes of coal last year, and from that you get approximately 740 million tonnes of CO_2. If that was a country by itself, its emissions would rank higher than Canada's and slightly below Germany's. If you add that to our domestic

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63 Ms Amanda McKenzie, Australian Youth Climate Coalition, *Proof Committee Hansard*, 20 May 2009, p. 24.

64 McKinseys, *An Australian Cost Curve for Greenhouse Gas Reduction*, February 2008, *Submission 764a*, p. 6.

65 Reverend Tim Costello, Chief Executive, World Vision Australia, *Proof Committee Hansard*, 22 April 2009, p. 79.

66 Dr Graeme Pearman, *Proof Committee Hansard*, 15 April 2009, p. 85.

> emissions, we would rank slightly below India in terms of our contribution to the problem.[67]

Arguments that 5 per cent reduction is already tough

2.60 On the other hand, there were some witnesses who regarded even the unconditional 5 per cent reduction as a tough target:

> We do not believe that negative five is a small ask. It is a big ask for Australian industry. It will require us to reduce emissions by around 20 per cent on what they otherwise would have been by 2020. So it is not an insignificant ask and it will have consequences.[68]

> …the minus five per cent target, which represents a 25 per cent reduction in emissions relative to expected trends and a 34 per cent reduction relative to per capita emissions, is some three to four times stronger than those proposed by other, wealthier countries such as the USA and countries of the EU, as measured by an impact on gross national product. AIGN advocates that Australians shoulder a fair share of the global burden—no more and no less.[69]

2.61 There were industry witnesses who feared for the future if this target is pursued – or at least pursued under the CPRS as currently formulated (see Chapter 4):

> …there will be less production, less exports and less regional employment from both of our [meat and dairy] industries,…[70]

> I am absolutely sure that we will see [cement] plants progressively shutting down prematurely in Australia.[71]

> The most immediate and significant impact of increasing the costs and risks of developing LNG [liquefied natural gas] in Australia is that it will threaten the industry's competitiveness…[72]

> Under the current scheme half of Rio Tinto's open-cut coal mines would be likely to close by around 2020.[73]

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67 Dr Brett Parris, World Vision Australia, *Proof Committee Hansard*, 22 April 2009, p. 82.

68 Mrs Heather Ridout, Chief Executive, Australian Industry Group, *Proof Committee Hansard*, 22 April 2009, p. 33.

69 Mr Michael Hitchens, Australian Industry Greenhouse Network, *Proof Committee Hansard*, 15 April 2009, p. 21.

70 Mr Chris Phillips, Dairy Australia, *Proof Committee Hansard*, 30 April 2009, p. 195.

71 Mr Chris Leon, Chair, Cement Industry Federation, *Proof Committee Hansard*, 30 April 2009, p. 48.

72 Woodside Energy, *Submission 375*, p. 3.

73 Mr Steve Hodgson, President and Chief Executive Officer, Bauxite and Alumina, Rio Tinto Alcan, *Proof Committee Hansard*, 28 April 2009, p. 127.

2.62 Some industry witnesses pointed out that they had already made significant investments to reduce emissions and that further reductions in emissions intensity were limited by the laws of physics:

> In integrated steel works such as Whyalla or Port Kembla, direct emissions from the use of carbon as a chemical reductant comprise about 80 per cent of emissions…Both companies' Australian blast furnaces are efficient by world standards in their reducing agent consumption. Energy costs such as coal have always been a focus of the industry and significant work has been ongoing to reduce these costs over a long period of time. There is very little ability to further reduce these direct emissions without a breakthrough in technology.[74]

> …since 1990, per tonne of product, we have seen a reduction of 25 per cent of CO_2…The reason for that reduction is primarily through large technological change.[75]

> If you look at the aluminium industry overall over the last 50 years we have reduced direct CO_2 emissions by 50 per cent without a carbon price...[but] in terms of process gains, efficiency gains and business gains we have reached a plateau.[76]

> ALOA's members have been active in reducing greenhouse gas emissions from their operations over the last two decades. In fact, the waste sector is the only sector under the CPRS that has actually recorded reductions in greenhouse gases in this period. Since 1990, the sector has reduced its overall emissions by 12.6 per cent.[77]

> …60 per cent of lime's emissions are in fact through the use of the raw material limestone and do not come from an energy basis…as such, there is no real opportunity for the lime industry to address that 60 per cent emissions base.[78]

2.63 The Department of Climate Change's special envoy agreed with the following characterisation of the argument for the targets in the *White Paper*:

> …we have got to make up for the fact that at the Kyoto agreement we were allowed an increase. Some people argue that, therefore, we have not done our fair share and we need a stronger target. But, in fact, that makes our

74 Mr Paul O'Malley, Chief Executive Officer, BlueScope Steel, *Proof Committee Hansard*, 22 April 2009, p. 13.

75 Ms Robyn Bain, Chief Executive Officer, Cement Industry Federation, *Proof Committee Hansard*, 30 April 2009, p. 47.

76 Dr Liu Xiaoling, President, Primary Metals Pacific, Rio Tinto Alcan, *Proof Committee Hansard*, 28 April 2009, pp 130 and 134.

77 Mr James Spedding, Secretary, Australian Landfill Owners Association, *Proof Committee Hansard*, 22 April 2009, p. 44.

78 Mrs Ros DeGaris, Chief Executive Officer, National Lime Association of Australia, *Proof Committee Hansard*, 21 April 2009, p. 19.

> trajectory harder to turn around and that is part of the justification for our target.[79]

Australia's influence in international negotiations

2.64 Some have questioned whether Australia's actions will make a difference to international agreements:

> With only one per cent of world GDP, we are neither prominent among world nations nor particularly influential within world councils. And while Australia has many well-qualified scientists, few of these are considered to be world authorities on climate change. Accordingly, it is pure hubris for Australia to attempt to take the lead in abatement activity.[80]

2.65 Professor Garnaut, a former ambassador to China, commented:

> That position is ignorant of the realities of Australian diplomacy. I know from my work on the review that views developed in Australia are very much respected in some of the developing countries that are going to be very important for the outcome. I have had lengthy discussions at ministerial level in Indonesia that confirm that. The Indonesian government sees Australia as a partner in its efforts to do something about climate change…In China we have access with ideas and we can play a very important role in helping to define a global regime that helps solve the problem and secures our interests in the process. I know from close interaction with those three countries, for a start, that what we say, so long as it is consistent with what we do, can have a significant influence on the outcome.[81]

2.66 Mr Don Henry, Executive Director of the Australian Conservation Foundation, believes that Australia can be influential:

> Australia can be influential in encouraging key nations, such as China and the US—and, in our region, Indonesia and India—to strive for a strong global outcome at Copenhagen...[82]

2.67 He gave as an example of past influence:

> Australia played a very strong and very positive role in getting a global agreement for the reduction of ozone depleting substances. [83]

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79 Mr Howard Bamsey, Deputy Secretary and Special Envoy, Department of Climate Change, *Proof Committee Hansard*, 1 May 2009, p. 88.

80 Dr Alan Moran, Institute of Public Affairs, cited in Senate Standing Committee on Economics, *Exposure draft of the legislation to implement the Carbon Pollution Reduction Scheme*, April 2009, p. 128.

81 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, p. 49.

82 Mr Don Henry, *Proof Committee Hansard*, 22 April 2009, p. 60.

83 Mr Don Henry, *Proof Committee Hansard*, 22 April 2009, p. 62.

2.68 Other witnesses argued that Australia should at least try to exert influence, and setting a good example was an important means of doing so:

> It is hard to see a scenario where Australia helps to achieve a strong global deal by offering to do very little in Australia.[84]

> …while we are not a superpower, we are an influential player in climate change negotiations. Since the EU negotiates as one block, there is only the EU, the US, Japan, Canada and Australia—they are the five significant developed countries in this.[85]

Australia's ethical obligations

2.69 There is also an ethical dimension, articulated by environmental philosopher Professor Albrecht, and supported by other witnesses:

> …Australia's obligation as a relatively rich, very wealthy, industrialised and well educated country is to take the lead on greenhouse gas reductions and to set standards that will deliver a safe and predictable world to future generations...we in Australia are privileged by virtue of the wealth that we have generated through our natural resources…That is precisely the kind of society that has to provide leadership to the rest of the world on all of these major globally significant issues…[86]

> …there is a strong economic and ethical argument for richer countries such as Australia, the USA and the European Union to take the lead on reduction commitments.[87]

2.70 Reverend Costello views it as not just a matter of international justice but inter-generational justice:

> Our generation, which has been the highest spending, worst saving generation in human history…has had the benefit of not pricing the carbon. For our generation to actually be locked in the counsel of despair, I have to say, as an Australian, is a failure of leadership.[88]

Australia's targets in the absence of (adequate) global agreement

2.71 In the event of no agreement being reached at Copenhagen, as noted above, the Government has said that Australia's target would be a 5 per cent reduction from 2000 emissions by 2020.

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84 Ms Trish Harrup, Greenpeace Australia, *Proof Committee Hansard*, 21 April 2009, p. 70.

85 Professor Stephen Howes, *Proof Committee Hansard*, 20 May 2009, p. 43.

86 Professor Glenn Albrecht, *Proof Committee Hansard*, 20 April 2009, p. 71.

87 Mr Amar Breckenridge, Frontier Economics, *Proof Committee Hansard*, 16 April 2009, p. 18.

88 Reverend Tim Costello, *Proof Committee Hansard*, 22 April 2009, p. 85.

2.72 One view is that the Australian unconditional target should be the same as the conditional offer.

> If doing something is the right thing to do, it remains the right thing to do whether or not others are doing it too.[89]

2.73 Professor John Quiggin of the University of Queensland said:

> … if the rest of the world does not do anything, we are in grave straits. The question is really a political one. We have to make an offer that is sufficient to be in earnest and good faith but sufficiently short of what we are going to do in an agreement. We are indicating the weight we place on an international agreement. That is to some extent a tactical question.[90]

Direct environmental impact of Australia acting

2.74 As Australia is only directly responsible for around 1½ per cent of global greenhouse emissions, if its actions have absolutely no influence on the rest of the world, the impact will be correspondingly moderate.

2.75 It is sometimes claimed that Australian actions in these circumstances would have *no* impact. A number of witnesses believe this is an exaggeration:

> Australia's emissions are at least 1.4 to 1.5 per cent of the global emissions as well, which may sound insignificant, but when you are dealing with a non-linear system, every bit matters. It is simply not the case that a relatively small amount of emissions necessarily has no effect on the climate. That can push us over the limit and over thresholds.[91]

> … a 20 per cent cut in Australian emissions by 2020 will cut projected global emissions by 0.2 per cent.[92]

> To a certain extent, the response of the climate system will be proportional to the emissions and over small ranges. If the emissions turn out to be 1½ per cent smaller than they would be otherwise because Australia reduced its emissions, say, to zero, that would have a significant effect on the climate. I do not like people saying that there will not be any effect. There will be an effect.[93]

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89 James Garvey, Secretary of the Royal Institute of Philosophy, *The Ethics of Climate Change*, 2008, p. 108.

90 Professor John Quiggin, *Proof Committee Hansard*, 28 April 2009, pp 19–20.

91 Dr Brett Parris, World Vision Australia, *Proof Committee Hansard*, 22 April 2009, p. 86.

92 Minerals Council of Australia, *Submission 425*, p. 15.

93 Dr John Hunter, Antarctic Climate and Ecosystems Cooperative Research Centre, *Proof Committee Hansard*, 23 April 2009, p. 8.

2.76 One witness noted that if every country with smaller emissions than Australia also took the attitude that it was not worth acting, this would represent about a third of global emissions that continue to grow.[94]

2.77 Another argument is that a failure at Copenhagen does not end the process. Environmentalists argued that it remains important for Australia to set an example.

> I think that Australia should lead because as an energy intensive nation we have a good opportunity to show that a country can become smarter and more efficient and retain its prosperity by using new energy sources.[95]

Is Australia acting alone?

2.78 There have been claims that in the absence of a comprehensive global agreement at Copenhagen that Australia will be acting alone. However, most witnesses acknowledged this was not the case:

> We recognise that Australia is not alone in proposing to take action to address climate change…[96]

> We are not acting alone. The developed world is moving on this issue. The United States is now taking steps to introduce emission trading schemes. Japan and New Zealand are doing so and Europe already has one.[97]

> …my view is that other countries over time will come on board, establishing various different ways of pricing carbon within their own economies…The trend that we have seen is that there are carbon prices out there in the world. In various places there are voluntary trading schemes, the European scheme of course, and a couple of regional schemes in the US that are proposed to start shortly.[98]

Early adoption

2.79 A number of witnesses pointed to advantages in Australia acting before all other (advanced) economies have agreed to act:

> One obvious big benefit would be to avoid having new investments that later turn out to be inappropriate in a low carbon world.[99]

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94 Ms Amanda McKenzie, Australian Youth Climate Coalition, *Proof Committee Hansard*, 30 April 2009, p. 45.

95 Ms Fiona Wain, CEO, Environment Business Australia, *Proof Committee Hansard*, 15 April 2009, p. 45.

96 Mrs Heather Ridout, Chief Executive, Australian Industry Group, *Proof Committee Hansard*, 22 April 2009, p. 32.

97 Mr Andrew Macintosh, Associate Director, ANU Centre for Climate Law and Policy, *Proof Committee Hansard*, 15 April 2009, p. 91.

98 Mr David Pearce, Executive Director, Centre for International Economics, *Proof Committee Hansard*, 16 April 2009, p. 7.

99 Dr John Pezzey, *Proof Committee Hansard*, 16 April 2009, p. 60.

> From a strategic point of view in terms of industry, it is actually about adopting the practices, growing the skill base and understanding this process that will be global in my view within less than a decade, and I think probably less than five years.[100]
>
> If the Australian government and Australian industry embrace this as an opportunity to play our part, then Australians will benefit from the jobs and the technology that we will develop. If our national policy settings focus on resisting change, we will allow other nations to get a head start on us that we may never recover from.[101]

2.80 It is argued that there is a need to encourage industry restructuring regardless of whether most countries in the world move quickly or slowly:

> I think the aluminium industry is a case in point. The question is how we develop industry restructuring to assist them to actually take advantage of Australia's huge resources of renewable energy. One way we may fail to do that is if we offer them free trading permits to allow them to continue to emit. [102]

2.81 On this view, if Australia waits it risks a poor outcome:

> …those countries that locked themselves in to a high-carbon future would be economic losers in the future—because the world will change.[103]

Risks of carbon tariffs if Australia does not act

2.82 Another disadvantage of inaction raised was the risk of facing carbon tariffs:

> The EU in the context of cement is already talking about imposing border taxes on non-compliant countries, countries which do not sign up to the general terms available to people. So I think a developed country which just says, 'Look, we can't do this and we won't do it,' is also taking a very substantial risk with its trade.[104]

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

101 Mr Dave Oliver, Australian Manufacturing Workers Union, *Proof Committee Hansard*, 22 April 2009, p. 4.

102 Dr Ray Wills, Chief Executive, Western Australia Sustainable Energy Association, *Proof Committee Hansard*, 20 April 2009, p. 46.

103 Mr Todd Stern, President Obama's climate change envoy, cited by Ms Harrup, Greenpeace Australia, *Proof Committee Hansard*, 21 April 2009, p. 62.

104 Professor John Quiggin, *Proof Committee Hansard*, 28 April 2009, p. 29.

Economic modelling

2.83 Deciding an appropriate emissions target for Australia requires an assessment of the economic costs involved, which can be informed by economic modelling.

Treasury modelling

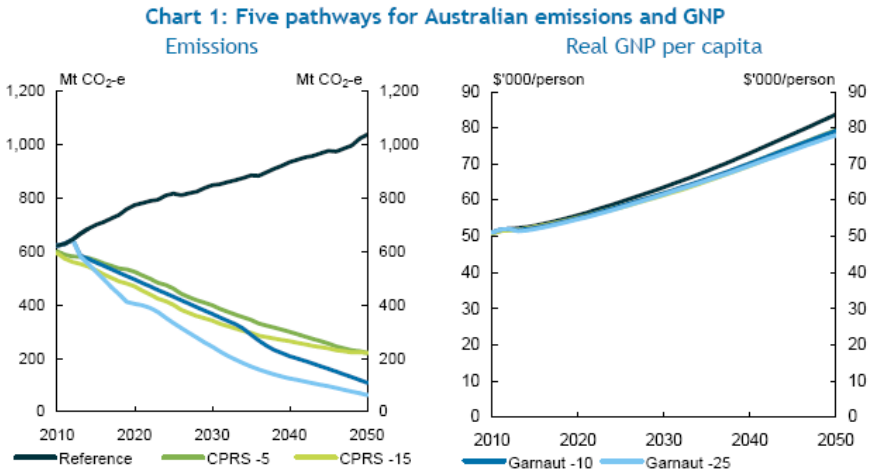
2.84 Treasury's modelling was released in October 2008, and was described by the Treasurer and Minister for Climate Change as 'one of the largest and most complex economic modelling projects ever undertaken in Australia'.[105] The work drew on a range of models with differing characteristics.[106] The key conclusions reached are:

> …early global action is less expensive than later action; that a market-based approach allows robust economic growth into the future even as emissions fall; and that many of Australia's industries will maintain or improve their competitiveness under an international agreement…[107]

2.85 The impacts on real income of differing emissions scenarios are illustrated in Chart 2.5. The key quantitative conclusion is that:

> From 2010 to 2050, Australia's real GNP per capita grows at an average annual rate of 1.1 per cent in the policy scenarios, compared to 1.2 per cent in the reference scenario.[108]

Chart 2.5: Treasury modelling



Source: Treasury (2008, p xii).

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105 Treasury, *Australia's Low Pollution Future: The Economics of Climate Change Mitigation*, October 2008, p. iii. This report is hereafter referred to as Treasury (2008).

106 The three main computable general equilibrium models used were the Global Trade and Environment Model (GTEM) developed by ABARE, the G-cubed model developed by Professor Warwick McKibbin of the Australian National University and the Monash Multi-Regional Forecasting (MMRF) model. They were supplemented by industry-specific models. The impacts on households were modelled using Treasury's Price Revenue Incidence Simulation Model (PRISMOD). Treasury (2008, pp 12–14).

107 Treasury (2008, p. ix).

108 Treasury (2008, p. xi).

Criticisms and commentary on the Treasury modelling

Modelling based on outdated specification of CPRS

2.86 There has been criticism that the Treasury modelling does not refer to the latest specification of the CPRS. The modelling refers to the ETS envisaged in the *Green Paper* and so does not incorporate the changes made in the *White Paper*. There have since been further changes to the CPRS announced by the Government on 4 May.

2.87 Ms Meghan Quinn, who led the Treasury's modelling team, explained:

> The main differences between the analysis that was undertaken in the modelling and the *White Paper* announcements were around the emission-intensive trade-exposed sectors. It is the case that the arrangements in the white paper were altered such that more transition assistance was provided to emission intensive trade exposed compared with the *Green Paper* proposals.[109]
>
> In general, the aggregate economic costs as a result of the changes between the *Green Paper* and the *White Paper* would not be expected to be very large at all, but there would be different distributional implications for both households and for sectors.[110]

2.88 On the specific issue of carbon leakage, the modifications to the scheme have been in the direction of reducing the imposts on large emitters, so revised modelling would presumably show smaller leakage effects.

No modelling of alternative schemes

2.89 The Treasury modelling compares the consequences of a few variants of the CPRS with 'business as usual'. It does not model some of the alternative schemes (discussed further in Chapter 3) such as a standard carbon tax, Carmody's consumption-based approach or the 'baseline-and-credit'/'intensity' approach, or indeed a purer version of cap-and-trade:

> …the claim in the *White Paper* that the CPRS will achieve abatement at lowest possible cost…is nowhere tested or demonstrated…It is fundamentally important that the abatement measures we adopt are in fact least cost, because that will mean we can afford to do more. I would like to see some explicit modelling to test that claim—that is, to test whether it really is the least possible cost of abatement.[111]

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109 Ms Meghan Quinn, Manager, Climate Change Modelling Division, Department of the Treasury, *Proof Committee Hansard*, 30 April 2009, p. 29.

110 Ms Meghan Quinn, Manager, Climate Change Modelling Division, Department of the Treasury, *Proof Committee Hansard*, 30 April 2009, p. 29.

111 Mr David Pearce, Centre for International Economics, *Proof Committee Hansard*, 15 April 2009, p. 22.

> I would love Treasury to model a consumption based approach.[112]
>
> … the standard benchmark that economists would use to assess low cost abatement would be to simulate an emissions trading scheme with full auctioning where that auction revenue is used to lower other distorting taxes…That simulation has not been done…[113]

2.90 To some extent the models used by Treasury may not be well-suited to this task. They are able to track through the system the consequences of a price being established for carbon, but are probably indifferent to the means by which the price is set. Some modelling at the level of individual companies may be needed to tease out the differences between baseline-and-credit and cap-and-trade systems.

No modelling of 'Australia going alone'

2.91 There has been criticism that Treasury has not modelled a 'worst case scenario' where Australia acts well in advance of competitors:

> What we do not see at the moment is an analysis, if you like, of the risks to Australia of different countries not imposing their own carbon price.[114]
>
> The Treasury did not even model what would happen if Australia acted on its own.[115]
>
> Given the nature of the collective action problem and the historical record of slow, partial and fragmented action, it is difficult to conceive why Treasury did not model and publicly release at least one policy scenario where comprehensive and coordinated global action fails to develop in the next decade.[116]

2.92 Treasury has responded that such a scenario would be very unlikely, especially given that many countries are already implementing an ETS.[117] Furthermore, Treasury has defended the assumption by arguing that:

> To assume otherwise — that is, to presume that the world's major emitters will not act at any time to decisively reduce greenhouse gas emissions — is to presume that the world will gradually succumb to potentially catastrophic damage to the global environment…The prehistoric peoples of Easter Island took this path, and paid the price (*Collapse*, Jared Diamond, 2005). We would do well not to follow their lead. Another logical possibility is

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112 Mr Geoff Carmody, *Proof Committee Hansard*, 15 April 2009, p. 31.

113 Mr David Pearce, Centre for International Economics, *Proof Committee Hansard*, 16 April 2009, p. 6.

114 Mr David Pearce, Centre for International Economics, *Proof Committee Hansard*, 16 April 2009, p. 7.

115 Mr Trevor St Baker, ERM Power, *Proof Committee Hansard*, 28 April 2009, p. 77.

116 Dr Brian Fisher, 'A peer review of the Treasury modelling of the economic impacts of reducing emissions', Concept Economics, 30 January 2009, p. 20.

117 The question of whether Australia risks 'acting alone' is discussed commencing paragraph 2.78.

> that majority scientific opinion is simply misguided and will turn out to be a fad. However, to invoke such a possibility as a basis for deciding on public policy seems to me extraordinarily foolhardy. [118]

2.93 Indeed, Treasury argues that their modelling already covers very pessimistic scenarios:

> …it was judged that having China take on no targets until 2015, despite currently doing quite a lot in the greenhouse gas space to reduce emissions, we are being more pessimistic than current government policies out to 2015. Then from 2015, China's emissions allocation continues to grow until 2030, which was judged to be realistic. Similarly, India does not do anything at all in the greenhouse gas space until 2020 and then its emissions allocation continues to grow until 2040. Other developing low income countries do not do anything until 2025.[119]

2.94 This progressive adoption of carbon pricing was viewed as too optimistic a programme by some witnesses:

> It is going to be an extremely long time before we have a comprehensive international scheme. Firstly, the negotiations are incredibly difficult and it is extremely unlikely that countries will sign up on the sort of timetable that is assumed, for example, in the Treasury modelling assumptions.[120]

Revised modelling to incorporate the global economic crisis

2.95 Treasury has also been criticised for not redoing the modelling to use a baseline incorporating the impact of the global financial crisis. Ms Quinn explained that they had not been asked by the Government to do such modelling:

> We have not been asked to examine in detail the implications of the GFC [Global Financial Crisis] through the suite of economic models that we used for the report.[121]

2.96 Moreover, Treasury felt that revising the modelling in the light of the crisis would not substantially change the results:

> …the long-term economic consequences for Australia of placing a price on emissions is largely unaffected by cyclical variations in output.[122]

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118 Dr David Gruen, 'The economic costs of reducing greenhouse gas emissions: understanding the Treasury modelling', Treasury *Economic Roundup*, no. 4, 2008, p. 27.

119 Ms Meghan Quinn, Manager, Climate Change Modelling Division, Department of the Treasury, *Select Committee on Fuel and Energy Hansard*, 19 November 2008, p. 63.

120 Dr Brian Fisher, *Proof Committee Hansard*, 30 April 2009, p. 212.

121 Ms Meghan Quinn, Manager, Climate Change Modelling Division, Department of the Treasury, *Proof Committee Hansard*, 30 April 2009, p. 26.

122 Ms Meghan Quinn, Manager, Climate Change Modelling Division, Department of the Treasury, *Proof Committee Hansard*, 30 April 2009, p. 26.

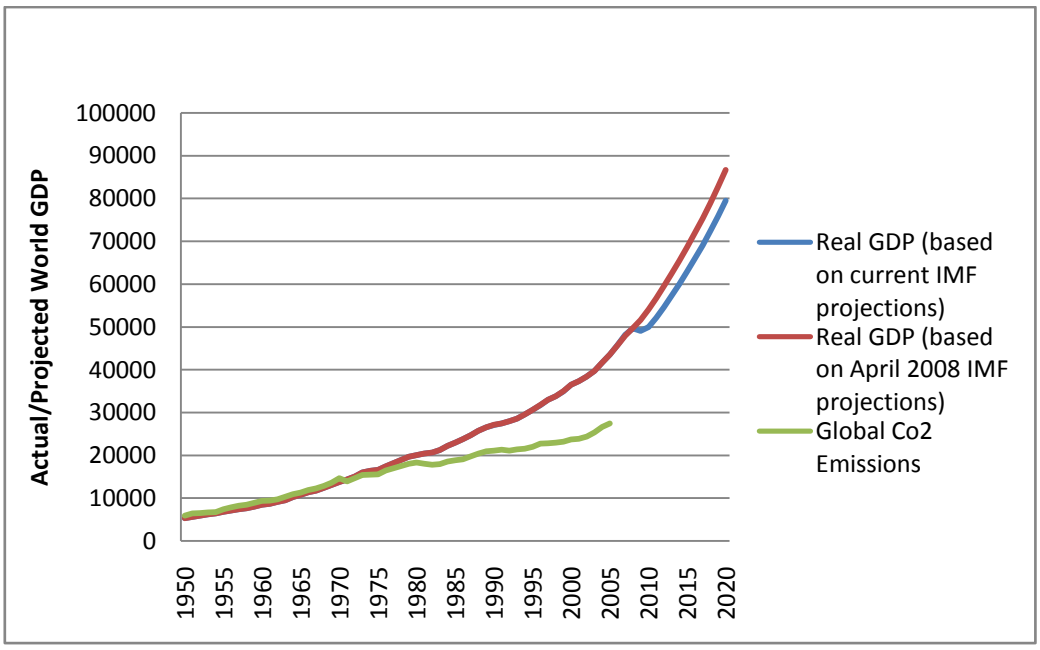
> …we do not believe that short-term cyclical influences on the Australian or global economy necessarily have a significant implication for the medium- and long-term impacts of emissions pricing on the Australian economy. That still stands true.[123]

2.97 Professor Garnaut provided some support to this view:

> …the global financial crisis and recession does not materially affect the costs of mitigation…[124]

2.98 The deterioration in economic prospects is illustrated by Chart 2.6. This shows the growth of global real GDP since 1950 (the upper line) and two forecasts—the current International Monetary Fund projections and that made a year ago.[125] (The lower line in the chart shows the path of global CO_2 emissions; the lines diverge when the mid-1970s oil crisis led to increased interest in energy efficiency.)

Chart 2.6: World real GDP and CO_2 emissions



Sources: Chart generated by Secretariat based on data from IMF, *World Economic Outlook*; A Maddison, *The World Economy: Historical Statistics*, OECD, 2003; World Resources Institute, CAIT database.

123 Ms Meghan Quinn, Manager, Climate Change Modelling Division, Department of the Treasury, *Proof Committee Hansard*, 20 May 2009, p. 8.

124 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, p. 45.

125 The IMF's April 2008 *World Economic Outlook* has projections to 2013 and the April 2009 issue out to 2014. In both cases the forecasts have settled down to around 4.8 per cent growth in the final projection years and this growth rate is assumed to continue to 2020 in the chart. The CO_2 emissions exclude those due to land use change and forestry. The units used in the chart are billions of 1990 (international Geary-Khamis) dollars for GDP and millions of tonnes for CO_2 emissions.

Full employment assumption

2.99 The Treasury modelling has been criticised for applying a full employment closure rule in the long run. This implies that the lack of impact on unemployment of introducing an ETS is an *assumption* rather than a *result* of the modelling.

2.100 Mr David Pearce of the Centre for International Economics, who has reviewed the Treasury modelling, was not critical of this for the long-term analysis:

> I think it is an appropriate closure in the long run, and these particular models are good at long-run analysis…[126]

2.101 Ms Quinn, who led the Treasury modelling team, explained that they used three models, one of which has the labour market adjusting rapidly and two of which have a more gradual adjustment. Models assuming a rapid adjustment in employment reflect a slowing in output in lower real wage growth rather than a rise in unemployment.[127]

Lack of modelling the transition

2.102 The Treasury modelling focuses on the long-run consequences; on the position of the economy once it has settled down into a new, lower-emission, equilibrium. It has less to say about the impact during the adjustment phase:

> The economic modelling solves each year of the scenario, so there are results for 2010, 2011, 2012 and 2013…Chapter 2 of the report outlines some of the limitations of the economic models that we have available to us. They do not necessarily capture all the transition elements and in some cases they are too fast in terms of their adjustment. They are typically, in our judgement, better for looking at after the first few years…What is important to look at for these economic models for these types of questions are averages and time frames.[128]

2.103 Mrs Heather Ridout of the Australian Industry Group emphasised to the committee that more attention should be paid to the difficulties of transition:

> … some people think that we will get in the Tardis booth in 2010 and get out in 2020 and everything will be hunky-dory… The Treasury's modelling acknowledged that they could not fully capture those transition costs…I go back to what I said after the Treasury modelling came out: it is not easy to capture the transition costs and we are not in a Dr Who Tardis box.[129]

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126 Mr David Pearce, Centre for International Economics, *Proof Committee Hansard*, 16 April 2009, p. 15.

127 Ms Meghan Quinn, Manager, Climate Change Modelling Division, Department of the Treasury, *Proof Committee Hansard*, 30 April 2009, p. 13.

128 Ms Meghan Quinn, Manager, Climate Change Modelling Division, Department of the Treasury, *Proof Committee Hansard*, 20 May 2009, p. 18.

129 Mrs Heather Ridout, Chief Executive, Australian Industry Group, *Proof Committee Hansard*, 22 April 2009, pp 33 and 43.

2.104 This aspect of the modelling was criticised by Dr Brian Fisher, director of Concept Economics:

> …you can see that there are no transaction costs and there are no transition costs represented in that modelling…It simply is not realistic.[130]

2.105 Dr Fisher is therefore critical of the modest costs of introducing a carbon price in the Treasury modelling:

> …that is what every piece of modelling will say to you if you do it in this particular way, that does not pick up the costs of taking people in regional Australia, getting them better jobs, putting them someplace else, retraining them and dealing with the fact that our energy intensive emissions associated with the aluminium industry, the alumina refining industry and so on effectively are no longer competitive in the world. [131]

2.106 Mr Pearce commented:

> The transitional analysis is not easy to do. The frameworks that we use generally take a long-term perspective, but it can be addressed. It is important to do so and to walk in with our eyes open about what the transitional consequences are. The fact that there are transitional costs is not a reason not to proceed with the policy, because mitigation has costs but those costs will hopefully be offset by benefits in the future.[132]

Lack of regional or more disaggregated modelling

2.107 The Treasury modellers presented results disaggregated by state and by industry. There was a call that Treasury should have done modelling at a finer degree of disaggregation:

> We had hoped the Treasury modelling exercise might have addressed the impact of higher energy prices on a sectoral, firm or regional level.[133]

> We were hoping for some more detail in that information regarding the impact on particular industry segments across each of the states and so on.[134]

> I believe there needs to be more extensive modelling so that we can assess the effects of an ETS scheme...I think drilling down into the detail is a component that I see missing so far…[135]

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130 Dr Brian Fisher, *Proof Committee Hansard*, 30 April 2009, p. 217.

131 Dr Brian Fisher, *Proof Committee Hansard*, 30 April 2009, p. 218.

132 Mr David Pearce, Centre for International Economics, *Proof Committee Hansard*, 16 April 2009, p. 15.

133 Mr Greg Evans, Australian Chamber of Commerce and Industry, *Proof Committee Hansard*, 30 April 2009, p. 116.

134 Mr Andrew Canion, Chamber of Commerce and Industry of Western Australia, *Proof Committee Hansard*, 20 April 2009, p. 7.

2.108 Frontier Economics prepared a report for the NSW Government, which contained results at a regional level. Unfortunately the NSW Government has not publicly released this report, although it has been discussed in the media.

2.109 Ms Quinn doubted whether modelling at a regional level would be sufficiently robust to aid in analysis of the CPRS:

> …we did not use the regional component of the MMRF [Monash Multi Regional Forecasting] model in the Treasury modelling because we did not think it was robust enough. The results coming out of it were nonsensical… Unfortunately the data sets available make it very difficult to do robust analysis at a quantitative level for regional economies.[136]

2.110 Questions were also asked about reconciling Treasury's modelling results with claims of imminent job losses by individual companies. Ms Quinn responded:

> Our economic modelling does suggest resources will move between sectors. You have had people say that they will be adversely affected and you have had people say that they will benefit from this scheme. What happens is that there is a shift between industries and that means a movement of capital and labour between industries in response to relative price.[137]

Lack of peer review and transparency

2.111 Treasury have been criticised for not making more detailed results public and having their modelling subject to the kind of 'peer review' that would apply to an academic paper published in a leading journal.

2.112 Mr Pearce cast a critical eye over Treasury's work. He said:

> I agree that those models themselves are sound. However, I believe in any modelling analysis it is very important to do a lot of sensitivity analysis to understand the importance of particular parameter choices within those models. That is one of the things that has not been done yet.[138]

2.113 A useful check on Treasury's use of the models was that Frontier Economics, as part of their regional analysis, replicated some of the Treasury modelling:

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135 Mr Tate, Lord Mayor of Newcastle, but appearing in a personal capacity, *Proof Committee Hansard*, 28 April 2009, pp 89 and 96.

136 Ms Meghan Quinn, Treasury, *Proof Committee Hansard*, 20 May 2009, pp 14–15.

137 Ms Meghan Quinn, Manager, Climate Change Modelling Division, Department of the Treasury, *Proof Committee Hansard*, 30 April 2009, p. 13.

138 Mr David Pearce, Centre for International Economics, *Proof Committee Hansard*, 16 April 2009, p. 10.

> The modelling results that we produced on one scenario—the one that has been reported most widely—is in fact the same modelling result, as far as we can tell, as that produced by the Treasury.[139]

2.114 The Senate Select Committee on Fuel and Energy commissioned a review from Concept Economics of the Treasury modelling. The author, Dr Brian Fisher, questioned some assumptions in the modelling which he thought 'likely to result in the Treasury modelling seriously underestimating the economy-wide and sectoral challenges associated with particular emissions reductions targets'.[140]

2.115 The Select Committee on Fuel and Energy sought unrestricted access to all the model codes and databases used in the Treasury modelling but it was not provided. The Government referred to the extensive documentation that had been made publicly available and claimed contractual arrangements with external consultants limited the additional information that could be provided.[141]

Inadequate modelling of consequences for the rural sector

2.116 Agricultural emissions are not included in the CPRS, at least in the initial years of its operations. However, this does not mean that the rural sector is unaffected. Farmers will face higher prices for electricity. They may also face lower prices for the animals and products they sell to food manufacturers as the manufacturers try to 'pass back' some of the additional cost they face in having to buy permits.

2.117 The committee heard claims that these impacts have not been properly addressed by the Treasury and Australian Bureau of Agricultural and Resource Economics (ABARE) modelling:

> As to most of the general equilibrium models that operate at the moment…they do not have the linkage back in terms of cost.[142]

> **CHAIR**—But none of the modelling that I have read through seems to take into account the impact on farm of the CPRS on the processing sector of agriculture… **Mr Keogh**—No, and the difficulty is that you cannot do that modelling until you know with some degree of certainty what proportion of the processing sector exceeds the 25 kilotonne threshold and therefore is required to pay a price for their emissions.[143]

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139 Mr Danny Price, Frontier Economics, *Proof Select Committee on Fuel and Energy Hansard*, 2 April 2009, p. 14.

140 Senate Select Committee on Fuel and Energy, *The CPRS: Economic cost without environmental benefit*, May 2009, p. 89.

141 Senate Select Committee on Fuel and Energy, *The CPRS: Economic cost without environmental benefit*, May 2009, pp 90–100.

142 Mr Chris Phillips, Dairy Australia, *Proof Committee Hansard*, 30 April 2009, p. 198.

143 Mr Michael Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 110.

2.118 Ms Quinn believed these effects were adequately reflected in the modelling:

> My understanding is that this analysis is quite comprehensive and…looks at the implications of, and has much more detail on, disaggregating the meat processing and dairy processing from the input side, so that you can get a feel for what is going to happen through the process chain in agriculture.[144]
>
> Can I clarify that the computational general equilibrium models used do link together agriculture and processing industries back and forward, just as occurs in the economy.[145]

2.119 There were more general requests for more detailed modelling of the effects on the farm sector:

> The government has done no sectoral modelling around agriculture, other than the broad general equilibrium model.[146]

Recommendation 1

2.120 The committee notes that the Treasury modelling was conducted in economic circumstances that were markedly different to those in which the legislation is proposed to now be introduced. Since the modelling was conducted the global financial crisis has led to a marked deterioration in the short-term economic outlook.

Whilst the CPRS package has been revised on two occasions, the modelling continues to fail to take into account the impact of these changed economic circumstances. The committee considers the modelling undertaken by Treasury to be inadequate and recommends that the Government direct Treasury to undertake further modelling. The further modelling should:

- **consider in detail the short-term adjustment costs;**
- **respond to criticisms made of Treasury's initial modelling including:**
  - **taking into account the deterioration of the Australian economy**
  - **the likely effect of the CPRS upon jobs and upon the environment**
  - **the absence of any modelling of the impact of the CPRS on regional Australia; and**
- **model other types of schemes that have been proposed as alternatives to CPRS, including:**
  - **a conventional baseline-and-credit scheme**

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144 Ms Meghan Quinn, Manager, Climate Change Modelling Division, Department of the Treasury, *Proof Committee Hansard*, 30 April 2009, p. 31.

145 Ms Meghan Quinn, Manager, Climate Change Modelling Division, Department of the Treasury, *Proof Committee Hansard*, 1 May 2009, p. 107.

146 Mr Bryan Clark, Grain Growers Association, *Proof Committee Hansard*, 30 April 2009, p. 67.

- **an intensity model**
- **a carbon tax**
- **a consumption-based carbon tax, and**
- **the McKibbin hybrid approach.**

The Garnaut Review modelling

2.121 The *Garnaut Review* modelling was broader than the Treasury modelling, as it also considered some of the costs of *not* addressing climate change. In particular it covered impacts on primary production, human health, infrastructure, tropical cyclones and international trade.[147] By 2100 real GNP, GDP, consumption and wages are 6-10 per cent lower than they otherwise would be as a result of climate change and the impact is continuing to grow.[148] Adding in the increased risk of absolutely catastrophic outcomes, and the non-market impacts, would raise these estimates considerably. Garnaut notes that other modelling has shown that costs in the 22nd century will be dramatically higher—perhaps approaching 70 per cent of global GDP by 2300.[149]

2.122 Concerning the costs of restricting emissions, the Garnaut modelling closely agrees with the results of the Treasury modelling, about a 0.1 per cent a year reduction in economic growth.

2.123 The net costs of mitigation become negative by 2060 (i.e. GDP growth is stronger with mitigation than under business-as-usual). Agriculture is the big winner (as crops are more sensitive to temperature than manufacturing) but by the latter half of the century mining also is doing better.

2.124 The modelling also throws some light on the difference between aiming to stabilise at 450 and 550 ppm. The more ambitious target costs an extra 0.7–0.9 per cent of GDP (in net present value terms). Given the environmental benefits and the insurance value of reducing the risk of catastrophic impacts, Garnaut:

> …judges that it is worth paying less than an additional 1 per cent of GNP as a premium in order to achieve a 450 result. [150]

2.125 Garnaut's conclusion is that:

> The costs of well-designed mitigation, substantial as they are, would not end economic growth in Australia, its developing country neighbours, or the global economy. Unmitigated climate change probably would.[151]

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147 *Garnaut Review*, p. 253.

148 *Garnaut Review*, p. 253.

149 *Garnaut Review*, pp 262–263.

150 *Garnaut Review*, p. 272.

2.126 He also comments that modelling of large changes to the structure of the economy is likely to overstate the costs of these changes:

> Experience shows that once consumers and producers have accepted the inevitability of change, and face predictable incentive structures, they will alter their behaviour to account for the new conditions more efficiently and effectively than previously predicted. This experience suggests that economic models are more likely to underestimate the benefits or overestimate the costs of changes in economic conditions, so long as the change is to stable institutional arrangements and predictable incentives. This bias may be further exacerbated by lack of data about the full costs of climate change impacts and a corresponding downward bias in the estimated benefits of avoided climate change.[152]

Australian Bureau of Agricultural and Resource Economics (ABARE) modelling

2.127 ABARE referred to their recent modelling:

> …we had a look at what the Government's settings are in the CPRS and the policy in the *White Paper* for the emissions-intensive trade-exposed assistance. Our examination of that showed that it did maintain the competitiveness of the trade exposed agricultural industries...you have very small impacts on the production costs of the agricultural sector…they vary between 0.1 per cent and a little bit under 0.5 per cent.[153]

2.128 As noted above, the cost impact on the agricultural sector is only part of the story. The impact on their prices from the effect of a carbon price on the food manufacturing sector is also relevant, so a whole-economy perspective is needed. Once these linkages are considered in their general equilibrium modelling, ABARE's modelling shows:

> In 2020 the carbon price under the CPRS minus five scenario is estimated to be $35 a tonne and also the shielding is in place for the emissions intensive and trade exposed sectors. What you see are small increases in production for beef and sheep meat and dairy cattle, a large increase for grains and small decreases for other animals and other crops.[154]

2.129 Some of the modelling results are dependant on the proportion of food manufacturing plants and abattoirs that are over the threshold to be captured by the scheme, currently 25,000 tonnes.[155] This may vary once the scheme is introduced: the

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151 *Garnaut Review*, p. 268.

152 *Garnaut Review*, p. 306.

153 Mr Phillip Glyde, Executive Director, ABARE, *Proof Committee Hansard*, 16 April 2009, pp 112–113.

154 Mr Phillip Glyde, Executive Director, ABARE, *Proof Committee Hansard*, 16 April 2009, pp 113–114. This modelling assumes no change in the climate.

155 Mr Michael Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 111.

committee heard of a company that was thinking of scaling back its large abattoir and recommissioning a number of smaller ones to stay under the threshold.

2.130 There were also criticisms that the ABARE modelling as it dealt with forestry paid insufficient attention to physical constraints on the available land:

> Finally, looking at some of the economic modelling by Treasury and ABARE that addresses just one of these aspects, and that is the Kyoto compliant afforestation… the total forestation area potential, according to their modelling, is about 5.8 million hectares, or about 20 megatonnes per annum on average. CPRS 15 rises to 26 megatonnes or 80 megatonnes per annum, which as I mentioned yesterday, in spatial area represents something like 20 per cent of the Murray-Darling Basin. If you go to Garnaut 25 and adopt a deeper short-term target and a long-term target, the total afforestation area rises dramatically to 40 million hectares…[which] spatially would be 30 to 35 per cent of the Murray- Darling Basin, but that would be spread across the Australian continent…[156]

> It is very implausible modelling. The ABARE models are not well constrained physically. Their assumptions about whether the land is going to be suitable for growing trees…I do not think that it is biophysically realistic.[157]

2.131 There is a further discussion of modelling of the rural sector by ABARE and others in Chapter 6.

Concept Economics modelling of the minerals sector

2.132 Some modelling by Concept Economics commissioned by the Minerals Council of Australia argued that employment in the minerals (including smelting) industry would be 23,500 lower in 2020 if the CPRS was introduced than if it was not introduced.[158]

Other modelling

2.133 Among other organisations to conduct relevant modelling are the CSIRO, Allen Consulting Group and Frontier Economics. They gave comparable results at a national level to the Treasury modelling, although the Frontier Economics study warned that some regions could incur larger than average costs.[159]

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156 Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 16 April 2009, p. 72.

157 Dr Chris Mitchell, Executive Director, Corporate Development, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 76.

158 Concept Economics, *The Employment Effects in the Australian Minerals Industry from the Proposed Carbon Pollution Reduction Scheme in Australia*, May 2009.

159 The results from these exercises are given in Chapter 4 of the Senate Standing Committee on Economics April 2009 report, *Exposure draft of the legislation to implement the Carbon Pollution Reduction Scheme*.

Chapter 3

Policy options to reduce greenhouse gas emissions

3.1 This chapter considers evidence given by witnesses regarding other ways of reducing carbon emissions including:

- a cap and trade scheme;
- a carbon tax;
- a consumption-based carbon tax;
- a conventional baseline-and-credit scheme and the related intensity model;
- the McKibbin hybrid;
- regulatory and incentive-based options; and
- the purchase of international permits.

A cap and trade scheme

3.2 A cap and trade scheme has—as its name suggests—two elements. The first is a limit on the quantity of pollution that can be emitted: the cap. The second is the facility to trade the limited number of carbon permits, after they are issued through an auctioning process. Companies are required to provide to the authorities permits equivalent to the amount they emit. Companies increasing their emissions will need to buy more permits, either at the initial auctions or in the market. Companies cutting their emissions need to buy fewer permits and may have surplus permits they can sell in the market. A cap and trade scheme thereby offers market participants the opportunity for 'least cost abatement'.[1]

3.3 A cap and trade scheme is the preferred policy approach of the Australian Government and forms the basis of the Carbon Pollution Reduction Scheme (see chapter 4).

3.4 The European Union (EU) introduced a cap and trade scheme in January 2005 which included 15 of the Union's 27 nations and covered nearly half the EU's emissions.[2]

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1 Pew Centre on Global Climate Change, 'Issue Overview: Cap and Trade versus carbon tax', http://www.pewclimate.org/docUploads/FINAL-USCAP-Issue-Brief-Cap-and-Trade-vs-Carbon-Tax.pdf (accessed 1 June 2009).

2 European Commission, 'Emission Trading Scheme', http://ec.europa.eu/environment/climat/emission/index_en.htm (accessed 1 June 2009).

3.5 New Zealand legislated the first cap and trade scheme outside Europe in November 2008.[3] The scheme is currently under review and its final form may depend on the scheme introduced in Australia.

3.6 The Obama administration in the United States has recently introduced a draft bill into Congress. The Bill proposes a cap and trade scheme with full auctioning of permits. The Bill proposes to cut US carbon emissions by 20 per cent from 2005 levels during the next decade.[4]

3.7 A number of witnesses who gave evidence before the committee supported an emissions trading scheme (ETS).[5]

3.8 In terms of the variants of ETS, evidence was given of a preference for a cap and trade scheme.[6] Professor Ross Garnaut is a proponent of a cap and trade scheme. In evidence to the Committee he said:

> A good ETS would…secure the emissions reduction objective directly… and it would fit more easily into a pattern of international trade in emissions entitlements which would be necessary to secure the participation of many developing countries in a global mitigation regime…I am comfortable that the ETS is sound as the centrepiece—not the only piece—of a national mitigation effort that fits into a global piece.[7]

3.9 Professor John Quiggin, of the University of Queensland gave evidence that:

> The market price of emissions permits in the EU has fallen sharply as a result of the financial crisis and recession. Some commentators have seen this as an undesirable outcome of emissions trading. In reality, it is a point in favour of emissions trading and against carbon taxes. The main concern with emissions trading is price uncertainty that arises when we are uncertain about the cost of reducing emissions. Under cost uncertainty, setting the emissions target too low could impose unexpectedly high costs on the economy. The situation is quite different when we consider macroeconomic uncertainty with respect to the rate of growth of the economy. An emissions target is countercyclical since it imposes a relatively high cost when the economy is strong, and a much smaller cost when the economy is weak. This is a beneficial stabilising effect.[8]

3.10 The Australian Industry Group gave evidence that:

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3 SustainableBusiness.com, 'New Zealand creates cap and trade scheme', http://www.sustainablebusiness.com/index.cfm/go/news.display/id/16729 (accessed 1 June 2009).

4 The American Clean Energy and Security Act of 2009, *Discussion Draft Summary*, p. 3.

5 See Mr Paul O'Malley, BlueScope Steel, *Proof Committee Hansard*, 22 April 2009, p. 13.

6 There are a few notable exceptions (see the discussion of alternative models below).

7 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, p. 45.

8 Professor John Quiggin, *Submission 289*, p. 11.

> …Ai Group supports Australia putting in place a cap and trade emissions trading scheme capable of delivering the Australian contribution to a global effort to reduce the accumulation of greenhouse gases and reduce the risks of dramatic climate change. An emissions trading scheme provides powerful incentives for business to search for least-cost emissions reductions; it reduces the scope for bureaucratic and political meddling in investment decisions; and, in contrast to a carbon tax, is able to align directly with a national reduction target through the quantity of permits issued.[9]

3.11 Santos Limited, an oil and gas exploration company, gave evidence that:

> Santos believes a well designed, market-based mechanism, such as a cap-and-trade ETS, as opposed to a carbon taxation system, is the lowest-cost path to the achievement of GHG emission reductions. In addition, an ETS can be linked globally to other trading schemes, such as the European Union scheme and the one now proposed by the new United States of America administration.[10]

A 'textbook' cap and trade scheme

3.12 Evidence was given to the Committee that a cap and trade scheme operates most effectively when all polluters face an undistorted price signal aimed at delivering the science-based objective.

3.13 For example, Dr Richard Denniss of the Australia Institute in his evidence to the Senate Economics Committee on 25 March 2009, highlighted significant discrepancies between what he calls a 'textbook model' and the Government's proposed CPRS (see chapter 4).

3.14 His preferred 'textbook model' includes the following features:

- targets based on science;
- coverage of all sectors in the scheme;
- no free permits for polluters; and
- no cap on the permit price.[11]

Qualified support

3.15 A significant number of submissions and evidence given to the Committee gave qualified support for a cap and trade scheme. These are discussed in further detail in chapter 4.

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9 Australian Industry Group, *Submission 605*, p 1.

10 Santos, *Submission 459*, p. 3.

11 See Dr Richard Denniss, 'Comparison of emissions trading in theory and the CPRS in practice', The Australia Institute, 2009, Forthcoming. Dr Richard Denniss, *Senate Economics Committee Hansard*, 25 March 2009, pp 76 and 78.

3.16 Evidence was given by industry witnesses of industry's overwhelming concern that a carbon market in Australia without a comparable market in other nations may put Australian industry at a competitive disadvantage.

3.17 For example BlueScope Steel gave evidence that a cap and trade scheme would only be acceptable if:

> …the system does not alter the international competitiveness of the Australian iron and steel industry. The system should be redesigned to be affordable and sustainable, only impose cost on Australia's EITEs [emissions-intensive trade-exposed industries] in tandem with and not ahead of our larger competitors, recognise the technological constraints on emissions abatement in steelmaking, provide incentives for investment in abatement, take account of the current global and economic crisis, minimise the risk to competitive trade exposed Australian manufacturing industry investment and jobs, and include appropriate transitional mechanisms.[12]

A carbon tax

Views supporting a carbon tax

3.18 The Committee heard evidence that a carbon tax would be an appropriate way to reduce carbon emissions.

3.19 The Government's Green Paper on the Carbon Pollution Reduction Scheme describes a carbon tax in the following terms:

> At its simplest, a carbon tax would work by taxing emissions at a constant rate. For example, a company would pay a set amount in tax for each tonne of carbon dioxide it emits. A carbon tax would not establish a cap on national emissions per se. However, a carbon tax is designed to discourage the consumption of emissions-intensive goods and services. Companies will reach a point at which it becomes more cost effective to undertake abatement and/or adaptation than incur the tax.[13]

3.20 The merit of a carbon tax as opposed to a conventional cap and trade scheme has been the subject of debate in policy circles.

3.21 The 2007 report of the Prime Ministerial Task Group on Emissions Trading (the Shergold report), commissioned by the previous federal government, considered the merits of a carbon tax but favoured a cap and trade approach.[14]

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12 Mr Paul O'Malley, Chief Executive Officer, BlueScope Steel, *Proof Committee Hansard*, 22 April 2009, p. 13.

13 See Carbon Pollution Reduction Scheme, *Green Paper*, July 2008, p. 78.

14 Prime Ministerial Task Group on Emissions Trading, *Report*, May 2007.

3.22 The committee notes that in February 2009, prior to the release of the Draft Exposure CPRS Bill the Government proposed a House of Representatives committee inquiry which included an examination of the merits of a carbon tax.[15]

3.23 A carbon tax is favoured by its proponents both for its simplicity and for providing investor certainty. It is simple insofar as it could be universally applied, without sectoral exemptions or compensation. It provides investor certainty because the level of the tax is fixed and known in advance.[16]

3.24 A cap and trade scheme, on the other hand, is potentially much more complex with the difficult issues of the level of the cap and compensation arrangements to negotiate. There is also less predictability and more volatility in carbon prices under a cap and trade scheme which may affect investor confidence.[17]

3.25 The 2007 Shergold report made the following comments in respect of a carbon tax:

> …in a world of uncertainty, a tax is preferable where the benefits of reducing pollution are likely to change less with the level of pollution than the costs of the pollution reductions. This is likely to be the case in the short run. The benefits of reducing emissions in any single year are unlikely to have very significant impacts (as climate change is dependant on the total stock of carbon equivalent emissions rather than the annual flow of emissions). However, the costs of abatement are likely to increase significantly as firms with fixed capital stock and technology find it harder to reduce emissions.[18]

3.26 In a joint submission to this inquiry, Mr Tim Kelly, and Professor Barry Brook gave evidence that as the cap under the proposed CPRS threatens to 'lock in failure', 'we should instead focus on a carbon tax'.[19] They give evidence of what they say are the advantages to a carbon tax relative to an ETS:

- it can commence at a low rate, and can be increased each year if national emissions are not reduced rapidly enough;
- it acts more smoothly throughout economic cycles compared with a cap and trade scheme;
- it promotes (rather than hinders) voluntary action and can be used effectively with complementary measures; and

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15 The House of Representative Economics Committee resolved to conduct the inquiry on 12 February 2009. On 20 February 2009, it resolved to discontinue the inquiry. The terms of reference directed the committee to inquire into the choice of emissions trading as the central policy to reduce Australia's carbon pollution.

16 See *Garnaut Review*, 2008, p. 196.

17 See Garnaut Review, 2008, pp. 196–197.

18 Prime Ministerial Task Group on Emissions Trading, *Report*, May 2007, p. 168.

19 Mr Tim Kelly and Professor Barry Brook, *Submission 552*, pp 2–3.

- it is more easily adjustable than a cap and trade scheme.[20]

3.27 In their submission to the Committee, ExxonMobil cited a 2008 research publication produced by the United States Congressional Budget Office which concluded that a long-term emission reduction target could be met more efficiently by a tax than by a cap and trade programme.[21] Exxon Mobil's submission noted:

> …a tax provides a more predictable and thus lower risk investment climate than a cap-and-trade system. The "environmental certainty" of a cap and trade system may be illusory. If a carbon tax at an acceptable level will not generate the desired emissions reduction, then a cap-and trade system set to produce the desired reduction could generate a much higher allowance price, ultimately resulting in the likelihood of political intervention.[22]

Views not favouring a carbon tax

3.28 Professor Ross Garnaut's preferred position is an ETS. He gave evidence that:

> A good ETS would be better than a carbon tax for two reasons. It would secure the emissions reduction objective directly, rather than through a process of trial and error requiring sequential adjustment to the carbon tax rate and it would fit more easily into a pattern of international trade in emissions entitlements which would be necessary to secure the participation of many developing countries in a global mitigation regime.[23] Only a good carbon tax will be better than a compromised ETS. Here we should not be persuaded that the grass is greener on the other side of the fence simply because it is on the other side. If the Australian government and parliament were debating the introduction of a carbon tax they would be subject to similar pressures from vested interests to those which have contributed to flaws in the ETS. It is not easy to say whether the government and parliament would be better able to defend the national interest if the pressure were over tax rates and exemptions rather than emissions targets and free permits.[24]

3.29 Professor John Quiggin in his submissions to the Committee argued that while the differences between a carbon tax and an ETS are more limited 'than most of the discussion suggests', tradeable permits have some significant advantages.

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20 Mr Tim Kelly and Professor Barry Brook, *Submission 552*, pp. 9–10.

21 Congressional Budget Office, 'Policy options for reducing CO_2 emissions', February 2008, http://www.cbo.gov/ftpdocs/89xx/doc8934/02-12-Carbon.pdf (accessed 5 May 2009).

22 Exxon Mobil, *Submission 519*, p. 5.

23 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, p. 45.

24 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, p. 45.

3.30 First, he claimed that the issue of free permits increases the political feasibility of an ETS relative to a carbon tax.[25] Second, given the risk that we fail altogether if individual countries fall short of their targets, 'it seems reasonable to prefer price uncertainty to quantity uncertainty'. Third, Professor Quiggin also emphasised the importance of international linkage towards a full-scale global market, which would be difficult to achieve through a coordinated system of global carbon taxes.[26] He told the committee:

> …in the context of international negotiations I think it is very difficult to see how we can achieve internationally coordinated carbon taxes in a world of many, many currencies, for example, whereas all of the negotiations so far have been on quantitative targets, and that makes sense for a global emissions trading scheme, which ultimately we need.[27]

3.31 Dr John Pezzey of the Fenner School of Environment and Society gave evidence that:

> …I contend that an effective ETS is politically more acceptable than an effective tax, not because it is theoretically better. I contend that an effective tax is politically unacceptable because no-one in policy circles has yet adopted my…idea of emission tax thresholds…Giving away such tax thresholds would be very similar to giving away emissions permits. The only big remaining difference is that with a tax the carbon price is set by government, not the permit market. But because this threshold idea does not exist yet, I think a tax scheme or anything similar…is worse than an improved CPRS in terms of cost, much worse in terms of delay and international linkage.[28]

A consumption-based carbon tax

3.32 Another variant on a carbon tax—a direct cost on every unit of emissions produced—is a carbon tax on consumption. This model proposes that the tax impost be borne by consumers (similar to a value added tax or a goods and services tax) rather than producers. It targets the country that consumes the goods and services resulting from the process generating the greenhouse gas emissions, rather than the country that produces these emissions. The rationale is that a country, such as Australia, can only control its consumption of emissions: attempts to control Australian production may lead to carbon leakage, loss of jobs and loss of competitiveness (see chapter 4).[29]

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25 Professor Quiggin sees this as a 'relatively minor point', however. Cash compensation could be paid out of revenue from a carbon tax.

26 Professor John Quiggin, *Submission 289*, p. 10.

27 Professor John Quiggin, *Proof Committee Hansard*, 28 April 2008, p. 16.

28 Dr John Pezzey, *Proof Committee Hansard*, 16 April 2009, p. 59. See also *Submission 616*, p. 6.

29 See Mr Geoff Carmody, 'Effective Climate Policy Change—the seven C's: Some design principles for evaluating greenhouse gas abatement policies', *Policy Note 1*, July 2008, p. ii.

3.33 Mr Geoff Carmody, a private consultant and a co-founder of Access Economics, supports a consumption-based carbon tax in Australia. In his paper 'Effective Climate Policy Change—the seven C's: Some design principles for evaluating greenhouse gas abatement policies', he sets out the following in relation to a consumption based carbon tax.

3.34 Fundamentally, a production-based mitigation scheme confronts the 'prisoners' dilemma' problem: a country that implements a mitigation scheme unilaterally is adversely affected, notwithstanding the optimum mutual benefits from multilateral action.[30]

3.35 Mr Carmody gave evidence to the Committee that 'if governments move to a consumption based approach, the prisoner's dilemma problem disappears'.[31]

3.36 In his paper he said "It overcomes concerns about carbon leakage and job losses and the 'current confused' debate about concessions for trade exposed industries".[32]

3.37 Mr Carmody in his evidence to the Committee stated that 'it is arguable that if Australia adopts the government's emissions trading scheme as currently structured it will increase incentives for our trading partners in Asia and America not to act on climate change'.[33] His argument is not with unilateral action per se, but the type of abatement scheme that Australia may unilaterally adopt:

> I do not mind accepting the moral argument that we were first to industrialise and that therefore we put a lot of stuff in the atmosphere first, but if we are going to do that then let us do it on a consumption base. That minimises the trade and job losses and carbon leakage risks and allows us to lead by example—'This is the way we can all go without a trade risk.' Then you get a global deal faster.[34]

3.38 Mr Carmody explained in his evidence to the committee that the original vision for international action on climate change in 1992 was a production-based global carbon tax, adding:

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30 Mr Geoff Carmody, 'Effective Climate Policy Change—the seven C's: Some design principles for evaluating greenhouse gas abatement policies', *Policy Note 1*, July 2008, p. ii.

31 Mr Geoff Carmody, *Proof Committee Hansard*, 15 April 2009, p. 28.

32 Mr Geoff Carmody, 'Effective Climate Policy Change—the seven C's: Some design principles for evaluating greenhouse gas abatement policies', *Policy Note 1*, July 2008, p. ii.

33 Mr Geoff Carmody, *Proof Committee Hansard*, 15 April 2009, pp. 22–23. This view was challenged by other witnesses who saw a strong lead by Australia on climate change as offering a powerful incentive for other nations to follow. See Mr Erwin Jackson, *Proof Committee Hansard*, 1 May 2009, p. 75.

34 Mr Geoff Carmody, *Proof Committee Hansard*, 15 April 2009, p. 29.

> That made sense. Immediately you had thrown out all concerns about competitiveness, carbon leakage and job losses due to one country acting before another.[35]

3.39 In 1997, however, the Kyoto Protocol codified the notion that countries would act at different times which, in Mr Carmody's view, rendered the production-based model unworkable. He told the committee that non-harmonised action has entwined environmental policy initiatives with trade considerations and has led to emissions trading schemes (current and proposed) with substantial carve-outs and compensation packages.[36]

3.40 How would a consumption-based carbon tax operate? Mr Carmody argues that adding an extra line to existing Australian Tax Invoices would make the carbon price signal highly visible throughout the economy. Each GST-based Tax Invoice would have the carbon cost per transaction included. The cost of emissions would be passed along the supply chain to the consumer through a GST-style process. In this way, Mr Carmody claims it would be 'a relatively simple matter to ensure that (most) Australian exports are not subject to the Australian market cost of emissions'.[37] Australian exports would not be exempt from carbon costs, but costs would be imposed by the importers of Australian exports. Mr Carmody also proposes that Australian imports could be brought into the carbon tax. By using the GST and Tax Invoice accounting system, together with data on Australia's carbon price, Australian producers' emissions intensity and Australian carbon price-exclusive products, the embedded market cost of imported emissions could be passed along the supply chain to the final Australian consumer. Mr Carmody thereby argues that the 'free rider' problem on the import side could be reduced.[38] Criticism of a consumption-based carbon tax

3.41 The committee received evidence that a consumption-based carbon tax would be difficult to implement in practice. Mr Salim Mazouz from the consultancy EcoPerspectives, gave evidence was that it is difficult to determine the quantity of carbon emissions embedded in an imported good. This is in contrast to a GST, where border tax adjustments are determined by the margin on the price of the good. He stated:

> Suppose I import an ingot of aluminium from somewhere. Say it comes from China. How much do I slap on it? You could say, 'Just take the average,' but the Chinese firm may say, 'No, we have a hydroelectricity generation plant that is feeding my production, so you should slap zero on

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35 Mr Geoff Carmody, *Proof Committee Hansard*, 15 April 2009, p. 23.

36 Mr Geoff Carmody, *Proof Committee Hansard*, 15 April 2009, p. 23.

37 Mr Geoff Carmody, 'Effective Climate Change Policy: The Seven C's: Implementing design principles for effective climate change policy', *Policy Note No. 2*, September 2008, p. i.

38 Mr Geoff Carmody, 'Effective Climate Change Policy: The Seven C's: Implementing design principles for effective climate change policy', *Policy Note No. 2*, September 2008, p. ii.

> it.' Someone else might say, 'No, actually that comes from coal fired generation,' or something like that. So the amount of carbon impost that should be imposed at the border to equalise this is rather problematic. It is much, much harder than with something like a GST.[39]

3.42 Mr Carmody gave evidence that it is not necessary to know the quantity of carbon embedded in imports. Imports would be assessed based on the equivalent Australian-made product. He stated:

> …all you need to know is the carbon price in Australia, the emissions intensity of the product in question in Australia, and convert that to an ad valorem equivalent adjustment and make sure that same percentage adjustment applies to imports from wherever they come. That actually is WTO-compliant in exactly the same way as the GST is.[40]

3.43 Mr Salim Mazouz gave evidence that the consumption-based carbon tax would still attract similar political pressures as a standard carbon tax:

> one would end up with very similar carve-outs [to an ETS] that come from the pressure applied by particular groups. Those pressures in part may be self-serving but in part also serve to ease the transition to an economy that is able to reduce emissions more efficiently over time.[41]

The 'baseline-and-credit' and 'emissions intensity' models

3.44 Another possible mechanism to reduce greenhouse gas emissions is a baseline-and-credit model. In its simplest form, this operates by setting a benchmark for each firm of its emissions in a base year. Thereafter any firm which wants to increase its emissions needs to buy credits from firms which are reducing emissions. This caps emissions at their level in the base year and establishes an incentive for companies to find lower emission processes. An example of a baseline and credit scheme is the New South Wales Government's Greenhouse Gas Abatement Scheme.[42]

3.45 A more sophisticated variant is the 'intensity' model. The intensity is a measure of carbon emitted for a given amount of production or revenue. A benchmark intensity is set for each 'industry', either based on average performance in a base year, or on (global) 'best practice'. Then a firm whose emissions intensity is below this level

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39 Mr Salim Mazouz, *Proof Committee Hansard*, 15 April 2009, p. 24.

40 Mr Geoff Carmody, *Proof Committee Hansard*, 15 April 2009, p. 30.

41 Mr Salim Mazouz, *Proof Committee Hansard*, 15 April 2009, p. 24.

42 For a critical analysis of this scheme, see Robert Passey, Iain MacGill and Hugh Outhred, 'The governance challenge for implementing effective market-based climate policies: A case study of the New South Wales Greenhouse Gas Reduction Scheme', *Energy Policy*, Vol. 36, 2008, pp. 3009–3018.

earns credits while firms above have to buy them. The benchmark intensities can be reduced over time to reduce total emissions by the economy.[43]

The baseline-and-credit / intensity-based model

3.46 In a submission to the Garnaut Climate Change Review, Frontier Economics, a proponent of the emissions intensity model, gave evidence supporting the baseline and credit/intensity based model approach.

3.47 It argues that while the incentive structures of the cap and trade scheme and the intensity-based scheme are similar, there is less 'churn' of revenue in the intensity scheme.[44] In evidence to the Committee, Mr Matt Harris, Frontier Economics consultant, stated:

> …what we are proposing is a mixture of carrots and sticks. You are penalising people at the margin and you are rewarding those that are relatively cleaner. The difference in the mechanism is that under the all sticks approach there generates a substantial pool of revenue that the government must then distribute, whereas most of the revenue generated in the scheme that we are proposing is recycled within the scheme. There is much less churn within the design of the scheme.[45]

3.48 In the Frontier Economics' submission it is stated:

> Given that under the intensity model, the firms paying for exceeding baselines are balanced by firms receiving funds for being under baselines, there should be no overall net effect on consumer prices, so no need for complex 'compensation' schemes. An intensity scheme would also offer a smoother transition for trade-exposed industries than a cap and trade scheme.[46]

3.49 Mr Harris also gave evidence to the Committee that:

> One aspect of the scheme is that if you allocate on the basis of a baseline for a unit of production, if you increase production there is a potential to create more permits. That is a criticism of this scheme, but the converse of that which must be recognised is that while the total cap of the scheme

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43 See Mr Danny Price, Select Committee on Fuel and Energy, *Committee Hansard*, 2 April 2009, p. 12.

44 Both the intensity-based and the baseline-and-credit scheme avoid churn. Revenue is recycled into a flat producer subsidy as opposed to the cap and trade scheme where there is a large transfer of funds into government coffers and then back out to consumers. See Frontier Economics, 'options for the design of emissions trading schemes in Australia', *Submission to the Garnaut Climate Change Review*, April 2008, p. 12.

45 Mr Matt Harris, *Proof Committee Hansard*, 16 April 2009, p. 16.

46 Frontier Economics does concede the possibility that lower price effects may impact on demand side abatement, which may therefore require other measures such as demand-side management rules. See Frontier Economics, 'Options for the design of emissions trading schemes in Australia', *Submission to the Garnaut Climate Change Review*, April 2008, p. ii.

> might increase in times of global or economic boom it also contracts in times of recession, such as the current environment. That is an important aspect that distinguishes this from other hybrid-type schemes that aim to cap the cost of emissions trading. For example, whereas you might have a scheme that has emissions trading with a price cap, to cap the cost of permits rising beyond a certain level, in times of economic boom, if that cap becomes binding, then you allow emissions to rise above the target set in that emissions trading scheme. On the converse, if you have a recession the carbon price just drops to zero and you do not achieve any further abatement. The difference in this scheme is that in those times of recession you actually achieve greater cuts than would be the alternative.[47]

3.50 Mr Amar Breckenridge, a consultant with Frontier Economics, gave evidence to the Committee that:

> In setting a baseline what you essentially do is work backwards from the overall target you want to achieve—for example, over a period of five to 10 years. You will set your baseline to try to achieve that target. Suppose the economy, over that time, will go up or dip below that trend, under this scheme for those periods of time lags above that trend you will have an expansion in emissions, and for the time below that trend you will have a contraction because the cap will expand when it is above trend and will contract when it is below trend. Under a cap and trade scheme what you would get is the price going up and down and changing around a lot. If you take the performance of the economy over time, if you set your baseline in view of achieving a certain amount of emissions, you would achieve that target but without the huge volatility in prices in between because of fluctuations over and above the cycle.[48]

Evidence opposed to the baseline-and-credit / intensity-based models

3.51 In evidence to the Committee Mr Salim Mazouz from EcoPerspectives stated:

> …while sector based intensity targets can have some advantages in transition, they also remove output based abatement incentives. If you have a target that is based on a particular industry—for instance, the steel industry…—the target means that the production of steel itself is not going to face a cost. So what happens is that people potentially will not substitute away from steel towards something like, say, wood when they are building. That substitution from outputs of emissions intensive goods and services does not happen under intensity based schemes.[49]

3.52 Dr Richard Denniss, Director of The Australia Institute, gave evidence that the incentives under an intensity scheme to shift production to lower emitting industries were weak.

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47 Mr Matt Harris, *Proof Committee Hansard*, 16 April 2009, p. 19.

48 Mr Amar Breckenridge, *Proof Committee Hansard*, 16 April 2009, p. 22.

49 Mr Salim Mazouz, *Proof Committee Hansard*, 20 May 2009, p. 59.

> What intensity targets are good at doing is changing the way industries behave but what they are bad at doing is giving signals to consumers to change their behaviour…If your objective is to make steel more energy efficient then intensity works; if your objective is to shift people away from steel and into something else by definition it does not work. Where that fits in with this broader debate is: are we trying to encourage economic transformation or are we trying to maintain the status quo with slightly lower emissions?[50]

3.53 Professor Garnaut in his Garnaut Climate Change review noted that a range of options exist under the baseline-and-credit scheme for setting the benchmark. These include: emissions in a base year; average emissions per unit of production based on installed technology in a base year; average emissions per unit of production based on best practice technology; or any combination of these approaches. He argued that 'the choice of algorithm introduced a high and unavoidable degree of arbitrariness into the design of the baseline and credit scheme', which would 'raise transactions costs and encourage rent-seeking behaviour'.[51]

3.54 In their submission to this inquiry, the Climate Institute noted that they had asked McLennan Magasanik Associates[52] to conduct a critique of the baseline-and-credit model. Part of this critique is reproduced in the Climate Institute's submission.

3.55 McLennan Magasanik Associates stated that while both a cap and trade and a baseline-and-credit scheme are 'likely to be equally efficient', 'the problems come when applying the schemes in practice'.[53] It offered the following four criticisms of a baseline-and-credit scheme:

- it is likely to carry higher administrative costs than a cap and trade scheme and is likely to be more complex to administer. This is because a baseline has to be set for each emitting activity based on historical emission and production rates. In the absence of this data, a theoretical baseline must be established based on formulas, which is complicated by the fact that emission intensities vary widely among plants in the same industry (and even the same company; see paragraph 3.[44]). The cost of setting a baseline for each of the 1000 liable entities in the proposed ETS would be very high;
- it creates greater uncertainty in achieving targets for emissions reductions because the model is based on emissions intensity, rather than emissions. If economic growth increases more than expected, there is no certainty that the

50 Dr Richard Denniss, *Proof Committee Hansard*, 20 May 2009, p. 59.

51 *Garnaut Climate Change Review*, 2008, p. 310.

52 McLennan Magasanik Associates are Australian consultants with expertise in energy, environmental and regulatory issues.

53 The Climate Institute, *Submission 406*, p. 21.

target will be met which compounds the risk of meeting internationally set targets;

- it can be more open to rorting as plant owners can manipulate the calculation of the baseline to levels that are higher than the real emissions intensity. They thereby avoid any impost and claim credits; and
- it provides no incentive for consumers to reduce their demand for emissions-intensive goods. To the extent that less emissions intensive activities are subsidised, more of that activity may be undertaken which may increase the overall emissions from that activity.[54]

3.56 Evidence was received from witnesses concerned about the administrative complexity of the baseline-and-credit and intensity based schemes.

3.57 Nyrstar Zinc gave evidence to the Committee that two of its smelters—in Hobart and in Port Pirie in South Australia—had different emissions intensities because its Hobart plant is a zinc electrolytic refining business whereas the Port Pirie plant is a blast furnace based technology.[55] In his evidence to the Committee, Mr John Laugher from Norske Skog said:

> Between Albury and Boyer we are using radiata pine. That level of intensity kilowatt hours per tonne to make the pulp necessary to make newsprint is pretty well benchmarked around the world on radiata pine. With different wood species it might be slightly different. The energy input between Albury and Boyer on our thermomechanical pulp would be the same.[56]

3.58 Mr Erwin Jackson in his evidence to the Committee stated that a baseline-and-credit model is not suited to an international agreement:

> …potentially creates a system which is more uncertain in terms of meeting your international obligation. We are going to have an international obligation unless the government decides not to ratify the next agreement, and if you have a system which is based on baseline-and-credit you have less certainty that you are actually going to achieve that international obligation, which means one of two things—that you are non-compliant and then the taxpayer has to buy international permits or that you are non-compliant and you walk away from the international agreement, which is effectively what Canada has done. Those things weaken the global architecture and weaken the global consensus, which is not in Australia's interest. The other point is that it is incredibly administratively complex and very arbitrary in terms of how you set the baselines.[57]

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54 The Climate Institute, *Submission 406*, pp. 21–22.

55 Mr Ivan Cauley, *Proof Committee Hansard*, 23 April 2009, p. 80.

56 Mr John Laugher, *Proof Committee Hansard*, 23 April 2009, pp. 51–52.

57 Mr Erwin Jackson, *Proof Committee Hansard*, 1 May 2009, p. 81.

3.59 He further stated:

> My view on the Canadian proposal is that it is dead, effectively. My interaction with the Canadian government officials and my Canadian colleagues is that the Canadians are now basically waiting to see what the US does before they do anything. If the US moves to cap and trade they will do everything they can to be part of that cap-and-trade system. So in effect it is now about to be relegated to the dustbin of history.[58]

The McKibbin hybrid model

3.60 Professor Warwick McKibbin, from the Australian National University, proposes an alternative emissions trading scheme design. It is often known as a 'hybrid model' as it combines some features from cap-and-trade and carbon tax discussed above.

3.61 Professor McKibbin has been a long-standing advocate of a scheme that—in his opinion—overcomes the price volatility and unpredictability of a cap and trade scheme. He describes his model as follows:

> There are three components of the policy. First, the industry has to have a permit to emit in a particular year. This is a standard cap and trade idea. Secondly, that you create the long-term property rights that go with the long-term commitment. If you have a 100-year target, you create permits which last for 100 years, but whose use is restrained to the year in which the annual permit is dated. You would have a long-term goal, which has a long-term permit like a long-term government bond, and every year that bond would give you a coupon which is your right to emit for that year. This long-term goal would be disappearing as with the rights to emit.
>
> You create a market in that, and if that is all you did then you would have something like the CPRS, except a much longer time frame. Rather than five or 10 years it would be 50 to 100 years. The innovation that we bring in, and which is also discussed in the *White Paper*, is the idea that in the short term we do not know what it will cost to hit that target. We need a way of capping the compliance costs. We set up what was called a Central Bank of Carbon whose role is to sell annual permits in a limited quantity at a guaranteed price, just for that year. In other words, the Central Bank of Carbon controls the price of carbon year-by-year, but the market sets the long-term price of carbon. The reason for doing this is that we know that is how we do monetary policy in most countries. In monetary framework we have a fiscal concept which ties down the long-term bond market and the long-term price of money. That is a market determined mechanism which we use to guide investment. We have an institution that is independent of politicians and bureaucracies, which is the Reserve Bank, and the goal of the Reserve Bank is to hold the interest rate constant for 30 days at a time.

58 Mr Erwin Jackson, *Proof Committee Hansard*, 1 May 2009, p. 81.

> You can use exactly the same analogy except that instead of 30-day constant interest rates you have five-year constant permit prices.
>
> So we have this way of getting from where we are to where we want to go with a very clear deep cuts target. We do not rule out the idea of going for deep cuts if it is possible, but we do have a guarantee that we never exceed the cost in the short term, and we have a mechanism for, gradually over time, raising the price of carbon to achieve the goal we set ourselves.[59]

Criticism of the McKibbin model

3.62 Evidence was given criticising the complexity of the McKibbin model. Mr Timothy Hanlin in his evidence to the Committee stated:

> Quite frankly, I think his scheme is a little bit complex.[60]

3.63 In evidence to the Senate Select Committee on Fuel and Energy Committee Mr Rynne gave evidence that:

> It is a slightly complex model. I have heard Warwick speak to that model a couple of times now and I must admit I have not fully grabbed it.[61]

3.64 In a research paper entitled 'Critique of the McKibbin-Wilcoxen hybrid emissions trading scheme', Clive Hamilton and Frank Muller state:

> One of the recognised hallmarks of good policy is simplicity. The hybrid system is complex and many audiences have been left confused after being presented with the system.[62]

3.65 In evidence to the Committee Professor Garnaut criticised the McKibbin model's autarchic approach. Professor Garnaut said:

> I do not think there is much chance at all of getting some of the big developing countries into a global regime unless there is trade in emissions entitlements.[63]

3.66 Mr Timothy Hanlin also gave evidence criticising the McKibbin model as out of tune with other approaches being taken internationally:

> One of the problems I have with McKibbin's plan or his alternative is that that moves us so far away from the Kyoto-type process that it would be

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59 Professor Warwick McKibbin, *Proof Committee Hansard*, 16 April 2009, p. 31.

60 Mr Timothy Hanlin, *Proof Committee Hansard*, 20 April 2009, p. 28.

61 Mr Rynne, Senate Select Committee on Fuel and Energy, *Committee Hansard*, 20 February 2009, p. 30.

62 Clive Hamilton and Frank Muller, 'Critique of the McKibbin-Wilcoxen hybrid emissions trading scheme', *Australia Institute Research Paper*, no 42, March 2007, p. 7.

63 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, p. 54. He cites as evidence a conversation with senior Indonesian ministers.

> almost impossible for us to link in, unless everybody else came our way. That would be my major concern. [64]

Regulation and incentives—ad-hoc approaches

3.67 An alternative form of government intervention to address climate change would be in the form of a mixture of 'command and control' style regulation or by providing incentives. A number of such measures have been proposed for dealing with climate change, either to sit alongside a market based approach as a 'complementary measure', or as measures which can provide an alternative to a market based approach (complementary measures are discussed further in Chapter 5).

3.68 Several examples of such ad hoc responses are already in existence in environmental regulation at Commonwealth and state/territory level. Examples which have been raised with the committee include mandating tighter energy efficiency standards and labelling in appliances, vehicles and new buildings. Other examples might include a moratorium on future construction of coal fired power stations; mandating the purchase of renewable energy through measures such as the Renewable Energy Target.

3.69 Incentives include funding for research and development or pilot projects, feed-in tariffs, subsidies (aimed at householders or industry) or rebate schemes to cover the cost of installing new technology (such as solar panel rebate schemes).

3.70 Although the committee heard a large number of witnesses speak in favour of market based approaches, this view was not shared by all witnesses. For example, Mr John Hepburn from Greenpeace gave evidence that direct regulatory action was required as a result of the urgency of the problem:

> There is not a single wind turbine anywhere in Europe that was built as a result of their emissions trading scheme—not one. They were built as a result of the renewable energy targets and feed-in tariffs and other direct regulatory policies.
>
> Our view is that climate change is so serious that we need a robust and urgent response to it rather than a tangential one. That brings us to the issue of emissions trading and why we think it should not be the central policy mechanism but one of a suite of different mechanisms. When we realised that asbestos was a problem, we did not put a price on asbestos, we did not set up a trading system in asbestos, we banned it and phased it out. We replaced it. We think that we need to adopt the same kind of direct regulatory response in terms of climate change.[65]

64 Mr Timothy Hanlin, *Proof Committee Hansard*, 20 April 2009, p. 28.

65 Mr John Hepburn, *Proof Committee Hansard*, 21 April 2009, pp. 58–59.

3.71 Professor Garnaut in the Garnaut Review expressed concern about the limitations of command and control style regulation in relation to climate change. He stated:

> Regulatory, or prescriptive, approaches to reducing emissions can be haphazard. They are inevitably informed by assessments of current and future mitigation opportunities by officials, based on expectations about the rate of technological development and the changing state of consumer preferences. Such policy mechanisms have difficulty in responding to the sometimes rapid but usually unpredictable evolution of technology and consumer preferences.[66]

3.72 The National Farmers' Federation in a submission to the Committee oppose command and control regulation as a means of dealing with climate change:

> The NFF does not currently support a regulatory approach for dealing with climate change. Such practices have been utilised by State Governments in Australia in the past, through the restrictive regulations of land clearing that have enabled Australia to meet its Kyoto targets. This regulatory practice has come at a significant cost to Australian farmers, led to numerous perverse outcomes and has created significant limitations to future farm productivity.[67]

3.73 In its submission to the Prime Minister's Taskgroup on Emissions Trading (March 2007), the Productivity Commission argued that putting a price on emissions (either via a carbon tax or emissions trading) could provide least cost abatement:

> Both emissions trading and taxes can lead to least cost abatement. Least-cost abatement is promoted by the creation of incentives to take up all abatement opportunities that have a lower cost than the emissions price. This is the major advantage of such directly targeted market-based mechanisms over other policy instruments.[68]

3.74 The Productivity Commission in its submission to the Committee noted the costs and inefficiencies associated with the existing 'patchwork' of approaches adopted across different sectors and jurisdictions in Australia:

> These schemes have resulted in a patchwork of costs and prohibitions relating to GHG [greenhouse gas] emissions in various sectors, but no consistent economy wide signal of the social costs of emitting GHGs. The outcome is that average abatement costs are higher than they need to be and many low-cost abatement options are not pursued.[69]

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66 *Garnaut Review*, 2008, p. 308.

67 National Farmers' Federation, *Submission 507*, p. 8.

68 Productivity Commission, *Submission 24*, p. 39.

69 Productivity Commission, *Submission 24*, p. 36.

3.75 Concern about conflicting regulatory approaches put in place at federal, state and territory level was expressed by several industry groups.

3.76 The Energy Users Association of Australia noted the 'costly and wasteful' overlap in different energy efficiency programmes.[70] The Chamber of Commerce and Industry Queensland also raised concerns about the potential for competing and inconsistent regulation at different levels of government.[71] The Plastics and Chemicals Industries Association shared the concern and called for greater national coordination of policies and regulations, and argued for a moratorium on new measures.[72]

3.77 The Australian Industry Greenhouse Network noted:

> The objective of developing a coherent and streamlined set of climate change measures across jurisdictions has long been requested by industry. In principle, this has been supported by Australian governments in successive iterations of a political commitment to a streamlining objective. However, in an overcrowded greenhouse and energy measures bandwagon – a 2008 audit by the Department of the Environment, Water, Heritage and the Arts has revealed over 140 Commonwealth and State (and Territory) measures – industry is yet to see any measure abolished and continues to witness the announcement of additional measures across jurisdictions with no regard for co-ordination, national consistency or efficiency, and contrary to stated cross-jurisdictional intentions.[73]

3.78 The National Farmers' Federation in its submission to the Committee advocates that a mix of incentive based approaches and investment in new techniques is the approach best suited to the agriculture sector:

> Alternative mechanisms that may be more appropriate for driving a positive response from Australian farmers include Greenhouse Best Management Practice (BMP) programs, environmental quality assurance programs, …certification schemes, R&D investment, transport infrastructure improvements, utility level renewable energy development and grant schemes.[74]

3.79 Mr John Connor of the Climate Institute gave evidence to the Committee noting the difficulty in achieving significant reductions by means of ad-hoc regulatory approaches in the absence of an ETS:

> It is important to see it as a package. Without an ETS we will need a bucket load of regulations to get to targets that are going to help us. We can patch

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

71 Chamber of Commerce and Industry Queensland, *Submission 728*, p. 6.

72 Plastic and Chemicals Industries Association, *Submission 729*, p. 12.

73 Australian Industry Greenhouse Network, *Submission 364*, pp. 17–18.

74 National Farmers' Federation, *Submission 507*, p. 5.

> them all together but there would be a substantial range of regulations that would be necessary to pull together the reductions that we need.[75]

Committee view

3.80 It is possible for emissions reductions targets to be met by command and control approaches. It is also possible that the right mixture of incentives could lead to dramatic reductions in emissions. Australian governments' approaches to date have consisted of a mixture of such approaches.

Purchasing global permits

3.81 Another approach canvassed by witnesses in their submissions to the Committee was to raise additional revenue from existing taxes and use this to pay emerging economies to reduce their emissions.

3.82 Mr Robert Lengyel, a private citizen, in his submission to the Committee stated:

> Do nothing in Australia—it is a waste of our resources and we will have a close to NIL effect on global CO_2 omissions. It would be much better to either pay +$1 billion dollars to local authorities in the Amazon and get them to offer bonus payments to loggers to STOP tree cutting or subsidize electric car manufacturers in China/India so their growing middle class will be able to make a green motor vehicle purchase at a very low cost.[76]

3.83 Some witnesses were opposed to this approach. Mr Paul Winn of Greenpeace Australia Pacific in his evidence to the Committee stated:

> These carbon credits would need to be sourced almost entirely from the developing world. Apart from the inequity of offsetting our emissions on developing countries, many of the potential offsets carry significant environmental, social and economic risks. The most likely offset credits that Australia would be seeking to purchase are those associated with reductions in deforestation, responsible for about 20 per cent of global greenhouse gas emissions.[77]

3.84 There is also the argument that Australia should be setting an example. If a rich high-emitting country does not think it can reduce its own emissions, this may not encourage poorer countries to introduce schemes to reduce their greenhouse gas emissions. Greenpeace also had some comments on this issue:

> In terms of the global climate negotiations the question is, should Australia do what is an equitable response, should we do less than that, or should we do some heavy lifting? Given the privilege that this country has, given our

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75 Mr John Connor, Climate Institute, *Proof Committee Hansard*, 20 May 2009, p. 38.

76 Mr Robert Lengyel, *Submission 708*, p. 1.

77 Mr Paul Winn, Greenpeace Australia Pacific, *Proof Committee Hansard*, 21 April 2009, p. 58.

> history of ingenuity, given how rich we are, given how abundant our renewable energy resources are, [Greenpeace Australia Pacific] thinks there is a very strong case that Australia should be setting a strong example globally. If we do not do it, who do we expect to take leadership?[78]

3.85 Mr Owen Pascoe of the Australian Conservation Foundation in his evidence to the Committee stated:

> that will mean we will not drive the transition that we need to see within Australia to take advantage of those green-collar jobs opportunities.[79]

Summary

3.86 This chapter looked at the evidence given by witnesses in relation to the different policy options available to reduce greenhouse gas emissions: a conventional cap and trade scheme; a carbon tax; a consumption-based carbon tax; a baseline-and-credit scheme and an intensity scheme; and regulatory tools.

3.87 Each of these options put forward has strengths and weaknesses.

3.88 The preferred option will depend on whether the priority is to ensure effective mitigation and adaptation of polluting practices or potentially to reduce emissions at lowest cost to industry. These priorities are, in turn, shaped by perceptions of risk:

- What is the risk to the environment if the price signal fails to ensure effective mitigation?
- What will be the long-term adaptation and mitigation costs for the economy if a strong price signal is not set in the short-term?
- What is the risk that if a rich, developed nation such as Australia does not implement an effective greenhouse gas abatement policy, an international agreement will not be reached?
- What is the risk that Australian-based companies will move offshore to seek cheaper options in nations without a price on carbon?
- What will be the short-to-medium term effect on the competitiveness of trade-exposed, emissions-intensive industries if other nations fail to act?

Committee view

3.89 The Committee believes that the Government should give transparent recognition to the options for an emissions trading scheme through processes which produce public confidence in the final proposal.

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78 Mr John Hepburn, *Proof Committee Hansard*, 20 April 2009, p. 70.

79 Mr Owen Pascoe, *Proof Committee Hansard*, 22 April 2009, p. 63.

3.90 The Committee is of the view that any Australian ETS should be primarily concerned about encouraging reductions in carbon emissions in Australia without imposing undue increases in costs to Australians.

3.91 Accordingly, the Committee is of the opinion that on the evidence presented to it the current CPRS does not achieve this primary objective and that alternatives options to abate greenhouse gas emissions must be considered.

Chapter 4

The effectiveness of the CPRS as an emissions trading scheme

4.1 This chapter sets out the findings of the Select Committee in relation to the choice of the Government's emissions trading scheme as the central policy to reduce Australia's carbon pollution taking into account the need to:

(a) reduce carbon pollution at the lowest economic cost,

(b) put in place long-term incentives for investment in clean energy and low-emission technology, and

(c) contribute to a global solution to climate change

Coverage of the scheme

4.2 The CPRS will cover a range of greenhouse gas emission and sources.

4.3 There are six greenhouse gases listed under the Kyoto Protocol which will be covered under the Scheme including carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, hydroflurocarbons and perflurocarbons.

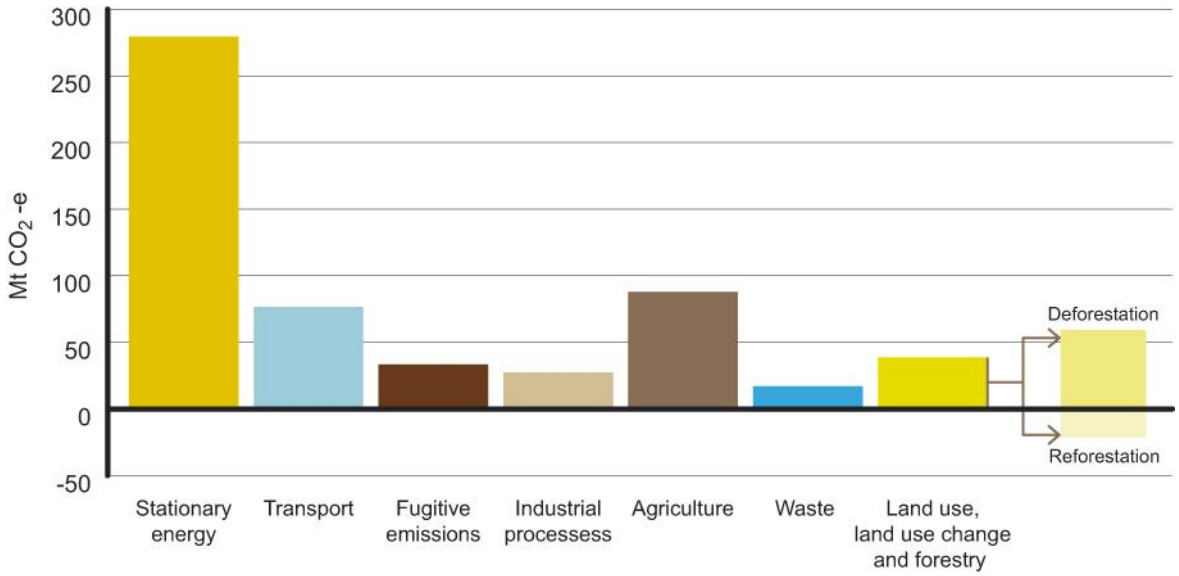
4.4 Carbon pollution permits will be needed for all emissions covered by the Scheme.

4.5 Chart 4.1 shows the contributions of various sectors to the 576 million tonnes of CO_2e emitted by Australian entities in 2006.[1]

4.6 It can be seen from the chart that the main cause of emissions in Australia is stationary energy - notably coal-burning power stations.

1 Definitions of the sectors are given in *White Paper*, pp. 6–2 and 6–3.

Chart 4.1: Australian emissions in 2006



Source: *White Paper*, p. 6-3.

4.7 The CPRS is proposed to include 75 per cent of Australian emissions and involve mandatory obligations for around 1,000 entities, considered to be the largest emitters in the country.

The timing of the CPRS

4.8 The Committee notes that very few countries actually have emissions trading schemes in place, namely, the European Union (where the scheme has been roundly criticised for failing to deliver CO_2 reduction outcomes) and New Zealand.

4.9 Therefore, central to the debate about whether Australia should introduce the CPRS at this time, prior to Copenhagen, is the issue of should Australia be leading the world, *irrespective* of actions the rest of the world may or may not take.

4.10 The committee notes the Government's statement that 'climate change requires a global response. In forging a global solution, Australia's actions inside and outside international negotiations matter'.[2]

4.11 Originally the CPRS legislation had a commencement date of 1 July 2010.

4.12 In May 2009, the Prime Minister announced a 12 month delay to the commencement date of the CPRS to 1 July 2011.

4.13 The Government stated that the later starting date is necessary 'to allow the Australian economy more time to recover from the impacts of the global recession'.[3]

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2 Department of Climate Change, Fact Sheet, December 2008, http://www.climatechange.gov.au/whitepaper/factsheets/pubs/008-australia-committed-to-shaping-a-global-solution.pdf, viewed 12 June 2009.

United Nations Framework Convention on Climate Change – Copenhagen Conference

4.14 In December 2009, the parties to the *United Nations Framework Convention on Climate Change* will meet in Copenhagen to discuss a climate pact to replace the Kyoto Protocol when it expires in 2012. The Copenhagen meeting will include consideration of the trajectory of carbon emission cuts through to 2020.

4.15 It is unclear at this stage whether developed nations will accept deeper cuts than those they have pursued under the Kyoto Protocol for the period 2008–2012. It is also unclear whether key developed nations, notably the United States, will take a legislated national position into the international negotiations.[4]

4.16 Copenhagen will also discuss pledges for richer nations to increase their budgets to pay for climate change adaptation and mitigation, and to enable the transfer of affordable clean-energy technology to developing nations. If progress is forthcoming on these issues of targets and funding, a new pact may come into force on 1 January 2013. If the talks stall, negotiations may stretch to 2010 and beyond.

4.17 The committee received conflicting evidence from witnesses as to whether Australia should pass the CPRS before or after Copenhagen.

4.18 Some witnesses gave evidence that Australia has a responsibility to show the way in international negotiations and that an early lead would resolve business uncertainty. Others questioned the wisdom of legislating an Australian emissions trading scheme before we understand what the rest of the world intends to do to reduce carbon emissions.

Evidence supporting legislation before Copenhagen

4.19 Professor Ross Garnaut had been initially hesitant in supporting the CPRS:

> Senator IAN MACDONALD—…If it [the CPRS] were not modified.., would it still be better than nothing?
>
> Prof. Garnaut—That is a really hard question. Let me say it would be finely balanced.[5]

4.20 After the Government's changes on 4 May, Professor Garnaut said:

> When I was asked by Senator Macdonald and answered that it was line ball, I said that there were three steps the government could take that would

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3 The Hon. Kevin Rudd, 'Carbon Pollution Reduction Scheme: Support in managing the impact of the Global Recession', *Media Release*, 4 May 2009.

4 See Mr Blair Comley, Deputy Secretary, Department of Climate Change, *Proof Committee Hansard*, 1 May 2009, p. 85.

5 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, p. 52.

> make it substantially beneficial. The first of those measures was to put back on the table the condition of 25 per cent reduction of emissions by 2020. The government has done that, so my assessment is that it now would be clearly a positive for this bill to be passed into law.[6]

4.21 Professor Garnaut in his evidence noted that the diplomatic case for taking a legislated cap and trade scheme to Copenhagen is the need for Australia to restore credibility on the international stage following its initial decision not to ratify the Kyoto Protocol.

4.22 His evidence to the committee included that the priority for Australia at Copenhagen:

> …is that we show that we are prepared to play a full proportionate part in an ambitious global agreement. Australia, as the developed country that would be most damaged by unmitigated climate change, should be taking a lead in shaping that Copenhagen agreement towards an ambitious outcome. If we had legislated the CPRS, that would just increase confidence that we were able to deliver on what we were promising.[7]

4.23 He observed that:

> The proposed legislation to establish an emissions trading system has good elements. The best of them is that it establishes the framework of an emissions trading scheme, the complex legal framework for many institutions and instruments that would need to be part of an ETS. It has taken much work and good work to get the legislation to this point. To now abandon this legislation comprehensively would introduce the chance that no government and parliament would want to try again.[8]

4.24 The Climate Institute also gave evidence that Australia has an important role to play on climate change policy internationally:

> What Australia does at home matters internationally. People look at us very closely. I think it would be wrong to characterise Australia as a non-player in the international talks. What we are doing here is being closely watched in the United States in terms of the emissions trading design and features that we have here.[9]

4.25 The Australian Industry Group (Ai Group) gave evidence that it would support passing 'a better designed CPRS…with the right system.'

4.26 In evidence before the committee prior to the Government's 4 May announcements, Dr Peter Burn of the Ai Group said:

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6 Professor Ross Garnaut, *Proof Economics Legislation Committee Hansard*, 22 May 2009, p 18.

7 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, p. 48.

8 Professor Ross Garnaut, *Proof Committee Hansard*, 16 April 2009, p. 45.

9 Mr Erwin Jackson, *Proof Committee Hansard*, 1 May 2009, p. 76.

> Another way to put it is to say that even if we got no greater indication of action at a global level than we currently have, but we had a better designed CPRS [emphasis added], we would support that. We are not saying wait until the rest of the world acts; we are saying let us act now but let us do it with the right system [emphasis added]. That system would be one that catered for the range of possible outcomes at Copenhagen, gave strong protections for trade exposed businesses and that provided enough time to get the design right and for business to prepare for the impacts.[10]

Evidence against legislation prior to Copenhagen

4.27 Other witnesses gave evidence of the potential disastrous impact on Australia, including losing its competitive advantage, if it were to take action prior to a global agreement.

4.28 Mr Mitch Hooke of the Minerals Council of Australia gave evidence that:

> …there are no prizes for unilateral action unless it is effective, demonstrable leadership…The only counsel I would give anybody is: do not overstate your own self-importance, do not get lost in the logic of your own arguments and be prepared for a whole stack of movements and developments the like of which you can rarely understand and appreciate.[11]

4.29 Mr Hooke also gave evidence that if Australia sets a carbon price through the proposed CPRS in the absence of an international agreement, Australian companies will be at a competitive disadvantage:

> …Even if the Copenhagen meeting fails, Australian firms will pay $8.5 billion in carbon costs every year from 1 July next year. None of our competitors will confront such costs. The CPRS is not linked to the availability of low-emission technologies. In fact, by imposing a $34 billion burden on Australian businesses in the first four years, it will reduce, if not largely eliminate, the ability of Australian firms to invest in these technologies. It is completely out of step with other schemes being developed around the world. Australian firms will pay the highest carbon costs of any other firms in the world. The results will be lost Australian jobs, stalled investment and a less competitive economy.[12]

4.30 Similar concerns were put forward by ERM Power.

4.31 Mr Trevor St Baker, Executive Chairman, ERM Power, gave evidence that to ensure certainty for Australian business, the CPRS must be aligned in both form and timing with an international agreement. As the process of an international agreement

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10 Dr Peter Burn, *Proof Committee Hansard*, 22 April 2009, p. 40.

11 Mr Mitch Hooke, Minerals Council of Australia, *Proof Committee Hansard*, 22 April 2009, p. 29.

12 Mr Mitch Hooke, Minerals Council of Australia, *Proof Committee Hansard*, 22 April 2009, p. 22.

may take years, Australia should concentrate in the interim on investment in low emission and renewable technologies.

4.32 Mr St Baker said:

> A prematurely legislated Australian CPRS would not deliver certainty whilst ever there were a possibility that amendments might be required to align our scheme with a global scheme. The process of designing the scheme and the timing of such a scheme will start to be determined in Copenhagen at the end of 2009 and will be decided by the major carbon polluters, mainly the USA and EU, and of course in collaboration with China in the longer term. That will not happen until sometime in 2010. The commencement of a global scheme is unlikely prior to the end of the Kyoto scheme in 2013. That is why, prior to the design and introduction of an international global carbon pollution reduction scheme, Australia should concentrate on inducements to investment in new, low-carbon emission power generation, including gas fired generation, similarly to the inducements to investment in renewable generation.[13]

4.33 Dr Richard Denniss, Director of the Australia Institute, also gave evidence against legislating prior to Copenhagen:

> …why is Australia rushing in to have our CPRS legislation passed before we have an international agreement at Copenhagen or beyond? A lot of the uncertainty that we are talking about here is about what is possible, what is going to be agreed to et cetera...One way to get around a lot of this uncertainty about what the world will and will not agree to is to wait until they do or do not agree to it.[14]

4.34 Dr Denniss raised concerns around the setting of targets prior to Copenhagen and the potential negative impact of doing this ahead of an agreed global target:

> This parliament will be signing an open-ended, blank cheque if we pass the CPRS with very low targets and then agree to more ambitious targets at Copenhagen. Taxpayers will have to pick up the difference. We will have to import an unknown quantity of permits from other countries, so we are locking in very timid targets. We are about to go into an international agreement where we do not know what will be the targets, and any shortfall will be made up by taxpayers, of which I am one, so I have a vested interest. If we are to have an emissions trading scheme that is designed to send strong price signals to the people who are polluting I would rather wait to find out exactly what will be our international obligation.[15]

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13 Mr Trevor St Baker, *Proof Committee Hansard*, 28 April 2009, p. 77.

14 Dr Richard Denniss, *Proof Committee Hansard*, 15 April 2009, pp 28–29.

15 Dr Richard Denniss, *Proof Committee Hansard*, 15 April 2009, p. 42.

4.35 Mr Andrew Canion, Senior Advisor, Industry Policy, Chamber of Commerce and Industry of Western Australia, gave evidence that the view of the CCI is that it is imperative that global action is taken. He said:

> What we think matters is that Australian industry is operating within the context of a global economy. It is important that we do not have imposts on our industries that are not equivalent to imposts in other nations.[16]

Committee view

4.36 The committee believes that action to mitigate the effects of climate change requires a global response.

4.37 It is therefore imperative that Australia defer consideration of the CPRS legislation until after an international agreement on greenhouse emissions targets has been finalised.

4.38 Legislative action prior to Copenhagen will have a negative impact on Australia and Australians. The committee does not support such action.

4.39 The timing and form of Australia's response must be in sync with the global response, particularly the targets set by the United States and other developed nations.

4.40 The committee also notes that the Shergold report, commissioned by the previous federal government, proposed the following timetable:

- 2008—a long-term aspirational target would be set and an emissions reporting and verification system established
- 2009—finalisation of key design features and establishment of the legislative basis of the scheme
- 2010—establishment of the first set of short term caps and allocation of permits
- 2011, or at the latest 2012—commencement of trading.[17]

Recommendation 2

4.41 The committee recommends that the CPRS legislation not be passed in its current form.

16 Mr Andrew Canion, Senior Advisor, Industry Policy, Chamber of Commerce and Industry of Western Australia, *Proof Committee Hansard*, 20 May 2009, p. 3.

17 Prime Ministerial Task Group on Emissions Trading, *Report*, May 2007.

The mechanism of setting caps

4.42 The Carbon Pollution Reduction Scheme Bill establishes that the national scheme caps will be set in regulations. This section of the report looks at those factors that will influence the setting of the emissions cap for a given financial year.

4.43 Sections 13 to 15 of the Bill set out the procedure for the Minister to follow in setting the annual emissions cap for each financial year.

4.44 It states that the Minister must 'take all reasonable steps' to ensure that regulations stating the national cap for the year beginning 1 July 2015 are made at least five years before the end of the eligible financial year. For each year subsequent to the 2015–16 financial year, the cap should be declared at least five years before the end of that financial year.

4.45 Section 14(5)(a) states that in making a recommendation on the level at which to set the national cap, the Minister *must* have regard to Australia's international obligations under the Climate Change Convention and the Kyoto Protocol.

4.46 Sections 14(5)(b) and (c) state that those factors to which the Minister *may* have regard in recommending the level of the national cap are:

- the most recent report given to the Minister by an expert advisory committee under section 354 of the bill;
- the principle that the stabilisation of atmospheric concentrations of greenhouse gases at around 450 parts per million of carbon dioxide equivalence or lower is in Australia's national interest;
- progress towards, and development of, comprehensive global action under which all of the major economies commit to substantially restrain greenhouse gas emissions and all of the advanced economies commit to reductions of greenhouse gas emissions comparable to the reductions to which Australia has committed;
- the economic implications associated with various levels of national scheme caps, including implications of the carbon price;
- voluntary action to reduce Australia's greenhouse gas emissions; and
- estimates of emissions that are not covered by the scheme.

4.47 The CPRS Bill 2009 includes changes from the exposure draft to the way that scheme caps and gateways will be set.

4.48 First, clauses 14 and 15 of the bill now state that a written statement must be tabled in parliament outlining the minister's reasons for the regulations underlying the scheme caps and gateways.

4.49 Second, the Government has announced that as part of its consideration of 'voluntary action' identified in paragraph 14(5)(c)(iv):

> Additional GreenPower purchases above 2009 levels will be directly recognised…[with] additional GreenPower purchases…measured annually and future caps…tightened on a rolling basis.[18]

4.50 The Explanatory Memorandum to the CPRS bill elaborates:

> The Government has indicated that additional GreenPower purchases will be measured annually and taken directly into account in setting scheme caps five years into the future, on a rolling basis. For example, the 2016-17 cap will be tightened to reflect the difference between 2009 and 2011 GreenPower sales, multiplied by a factor to reflect the emissions saved. This will achieve emissions reductions beyond Australia's national targets as it will be backed by the cancellation of Kyoto units.[19]

Setting the cap - the need for certainty

4.51 The Committee heard evidence that it is important for business to know well in advance the level at which the cap will be set.

4.52 AGL gave evidence to the Committee that:

> Without a doubt, the sooner we see the regulations the better, but, for a company like AGL, the principal decision points for a company investing in energy infrastructure are really what the targets will be. We know what is proposed in the legislation for the first three years and the gateway for 2020. From our perspective, when you think about modelling the carbon price and incorporating that into a business decision, having the certainty around what those targets are is the most critical thing, from our perspective.[20]

4.53 Woodside expressed similar concerns giving evidence that it is important to have 'a sufficient amount of detail' in the legislation rather than in regulations.

4.54 Mr Niegel Grazia of Woodside gave evidence that the long-term, large scale nature of the company's liquefied natural gas investments meant it will have to rely on 'two or three instances' of ministerial discretion for continued assistance.[21]

4.55 The Energy Supply Association, the peak industry body for the stationary energy sector in Australia, told the committee that the CPRS should incorporate rolling scheme caps:

> We believe that the CPRS should also commit to 10 years of rolling scheme caps, followed by a 10-year rolling gateway. The energy industry recognises that the setting of scheme caps and gateways requires a balance

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18 Australian Government, 'Helping all Australians do their bit on climate change', *Media Release*, 4 May 2009.

19 *Explanatory Memorandum*, p. 80.

20 Mr Tim Nelson, *Proof Committee Hansard*, 21 April 2009, p. 12.

21 Mr Niegel Grazia, *Proof Committee Hansard*, 28 April 2009, p. 68.

> between economic efficiency and policy flexibility to allow the government to respond to changes in scientific knowledge and international commitments. However, the government is the only entity that can commit Australia to international negotiations and therefore the government should bear the risk of future scheme caps and/or gateways being inappropriate. With long-lived, capital-intensive infrastructure, the industry cannot be expected to bear this risk.[22]

The need for political independence

4.56 The committee also heard that the task of setting the cap should be the responsibility of an independent statutory authority, not the Minister.

4.57 This view was flagged by the President of the Australian Council of Trade Unions, Ms Sharan Burrow:

> … The more I think about it, the more I think we need an independent monitoring assessment authority—a statutory authority as appropriate. It does seem to me that the work of making sure that the commitments, the transparency, the effort—whether it is decay, the situation of corporations or all of those things—requires an incredibly detailed and scientific base. With due respect, for that to come back to a political authority from any party does not seem to me the way we would run any other major part of the economy…I would urge the committee to consider the role and whether a statutory authority or some other such independent body is not a better way to set Australia up for a scientific base to these considerations, as opposed to the normal cut and thrust of political decision making.[23]

4.58 Some witnesses expressed concern that the CPRS, as proposed, does not have an adequate governance framework.

4.59 Dr Regina Betz of the Centre for Energy and Environmental Markets contrasted the Government's Draft Exposure Bill with the electricity market, which has a clear separation of policy (the Ministerial Council on Energy and COAG), a rule-maker (the Australian Energy Market Commission), a regulator and an organisation responsible for operational aspects. Any party can put forward a proposed rule change at any time, and then a formal process begins. She added:

> I do not think we see anything like that rigour in what is currently proposed for governance for this scheme. The one thing we do know is that, when the scheme initially goes in, we will make mistakes, potentially very significant mistakes. Our ability to correct those is going to be a key part of success or failure.[24]

4.60 Evidence was also given that if ministerial discretion is to be applied effectively in adjusting a trading scheme, it must set a principled standard.

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22 Ms Clare Savage, *Proof Committee Hansard*, 28 April 2009, pp 31–32.

23 Ms Sharan Burrow, *Proof Committee Hansard*, 22 April 2009, p. 2.

24 Dr Regina Betz, *Proof Committee Hansard*, 1 May 2009, p. 64.

4.61 This point was made by Dr Iain MacGill, also a director of the Centre for Energy and Environmental Markets:

> At one level if you are very outcome focused then a great deal of ministerial, hence political, direction can go one way or the other. It might be very productive and allow very important changes to be made in the timescale that might be required. However, in the general sense we look to establish processes that provide guidance on how decisions will be taken with some view as to the boundaries of those. If we look at the national electricity market, there are opportunities for significant political discretion to play out. However, there is a very conscious attempt to establish a process by which you will establish a basis of fairness or appropriateness as to such discretion being exercised.[25]

Setting the cap - the need for flexibility

4.62 The committee heard from some witnesses that there must be flexibility in setting the cap to allow for both a strong international agreement and adjustment to take scientific factors into account.

4.63 Environment Business Australia argued:

> Originally the concept of the CPRS was for it to be a flexible market mechanism. It has lost a lot of its flexibility and market aspect as well. In terms of the nimbleness, I think the five-year gateways may be a problem because we may need to reset those given the science that is coming out. We need to be far more flexible if we do need to set much stricter year-by-year targets for emissions cuts.[26]

4.64 Dr Graeme Pearman, a former Chief of CSIRO Atmospheric Research, gave evidence that:

> …you do not lock in any of the agreements for too long because the uncertainty exists and will solve some of those problems and will understand them better in another year's time and another. At that point in time you do not want to be locked in for 20 years in terms of how you respond.[27]

Exceeding expectations

4.65 The committee also received evidence that in setting the cap, it is important to take account of complementary measures such as energy efficiency initiatives, soil sequestration and investment in renewable energy.

4.66 The Hon. Tom Roper, President of the Australian Sustainable Built Environment Council, gave evidence that:

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25 Dr Iain MacGill, *Proof Committee Hansard*, 1 May 2009, p. 64.

26 Ms Fiona Wain, *Proof Committee Hansard*, 15 April 2009, p. 46.

27 Dr Graeme Pearman, *Proof Committee Hansard*, 15 April 2009, p. 96.

> …it is very important in both determining the mix of measures that are being taken and doing a proper sum on how that affects the cap. Let us take the CIE material on buildings. If you effectively, through a series of measures, save 52 million tonnes of carbon in the building area, that will clearly change the way in which you might determine a cap and will also change your estimate of what costs will be. The macroeconomics people really need to examine that.[28]

4.67 Ms Burrow expressed her concern the 2020 cap may underestimate the potential for abatement from complementary measures:

> Having that cap to 2020 will deny us the right to actually measure what we are doing. I think, in green building retrofit schemes alone, in the built sector, we can do more. In soil sequestration we could actually take a lot more carbon—indeed, legacy carbon—out of the atmosphere a lot quicker than we will get to do from the ambitions in an ETS.[29]

Carbon leakage and arguments for assistance for trade-exposed firms

Carbon leakage

4.68 The government has defined carbon leakage as:

> The effect when a firm facing increased costs in one country due to an emissions price chooses to reduce, close or relocate production or to close or relocate production to a country with less stringent climate change policies.[30]

4.69 The main argument made for assistance to industry is to address the risk of 'carbon leakage'. In this regard, the government has recognised the need to provide assistance to industry in the *White Paper*. The *White Paper* stated:

> Australia's adoption of a carbon constraint before other countries may have a significant impact on its emissions-intensive trade-exposed industries. The Government is committed to providing assistance to these industries to reduce the risk of carbon leakage and provide them with some transitional assistance.[31]

4.70 The issue of carbon leakage was a particular concern of the Senate Select Committee on Fuel and Energy.

4.71 At paragraph 5.111 to 5.113 of the majority Interim Report, it stated:

> In conclusion, the majority of evidence received by the committee on the issue of the international competitiveness of Australian industry and carbon leakage can be summed up with the following quote: 'it would be a perverse

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28 The Hon. Tom Roper, *Proof Committee Hansard*, 22 April 2009, p. 58.

29 Ms Sharan Burrow, *Proof Committee Hansard*, 22 April 2009, p. 10.

30 *White Paper*, p. F-4

31 *White Paper*, p. 12-1.

> outcome if the implementation of the CPRS in Australia led to a result which added to global emissions.'
>
> ***Committee comment***
>
> The committee considers that in the absence of an appropriate global framework the CPRS as currently designed will not sufficiently mitigate the risk of carbon leakage.
>
> The committee is of the view that:
>
> - EITE assistance should be expanded so that it is based on production rather than on an activity basis;
> - EITE assistance should be maintained at commencement levels until major competitors face comparable carbon costs;
> - The coal mining industry should not be excluded from EITE assistance;
> - Appropriate recognition should be given to those industries that contribute to a global reduction in emissions, such as LNG.[32]

4.72 The committee recognises that there are many ways in which carbon leakage can occur. For example through a company closing its Australian facility and opening a new facility in a country without a carbon price. Alternatively, whereby the Australian producer gradually loses market share to an overseas competitor as a result of Australia introducing a price for greenhouse gas emissions. In this scenario, existing plants may continue to operate but there will be no new investment.

4.73 The committee agrees with the conclusion of the Select Committee on Fuel and Energy that 'it would be a perverse outcome if the implementation of the CPRS in Australia led to a result which added to global emissions'.[33]

Evidence of serious concerns

4.74 Many industry representatives raised carbon leakage as a real and serious concern.

4.75 For example, Mr Andrew Canion, Senior Advisor, Industry Policy, Chamber of Commerce and Industry of Western Australia, gave evidence that his organisation have been advised by its members that the risk of carbon leakage is real and that a rational economic business decision would be to invest where it is the least costly to do so:

> We have been advised by our member companies that the risk of carbon leakage is real and that a rational economic business decision would be to invest where it is the least costly to do so. We have further been advised that there is a risk that, should Australia introduce an emissions trading

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32 Senate Select Committee on Fuel and Energy, *Interim Report: The CPRS: Economic cost without environmental benefit*, May 2009, pp 151-152.

33 Senate Select Committee on Fuel and Energy, *Interim Report: The CPRS: Economic cost without environmental benefit*, May 2009, p 151. The statement was originally made by Ms Nicky Cusworth from the Western Australia Department of Treasury and Finance.

> scheme of itself without complementary action internationally, a rational business decision would be to look at those other options. [34]

4.76 Mr Frank Topham, Manager, Government Affairs and Media, Caltex Australia Ltd, provided evidence to the committee that:

> I think under the CPRS carbon leakage will be a very grave threat to Australian manufacturing industries, including oil refining. It is very difficult to quantify at this stage what the exact impact would be.[35]

4.77 Mr Timothy McAuliffe, Manager, Environment and Sustainable Development for Alcoa of Australia provided evidence to the committee that:

> Alcoa believes there are a number of key changes that need to be made to its [CPRS] design to ensure it does not lead to carbon and jobs leakage from the Australian aluminium industry.[36]

4.78 Mr Bradley Teys, Chief Executive Officer, Teys Bros Pty Ltd, gave the following evidence to the committee:

> I just want to make sure that the scheme we put in for the cattle and livestock industry does not in fact reduce our exports so that Brazil, which is 40 per cent less efficient, picks them up and we have carbon leakage.[37]

Alternative views

4.79 Ms Meghan Quinn, a representative from Treasury, gave evidence that:

> A modelling organisation called CICERO, which is a reputable organisation within Europe, estimates that carbon leakage would be under three per cent for the entire Kyoto regime between developed countries and developing countries. Similarly, in the modelling produced in the *Australia's low pollution future* report, we found that, once emissions-intensive trade-exposed industries had been allocated permits under the 90-60 per cent ratio in the *Green Paper*, there was little evidence of carbon leakage in the economic models that we used.[38]

4.80 Other witnesses also questioned the likely extent of carbon leakage:

> But most estimates are that it is quite moderate—in the order of five to 15 per cent. One of the key factors is that these are very capital-intensive industries, so they make decisions on location not only on the prices today but on … whether there will be a carbon price—in 10 or 15 years time…even if countries like China do not have an explicit carbon price

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34 Mr Andrew Canion, *Proof Committee Hansard*, 20 April 2009, p. 4.

35 Mr Frank Topham, *Proof Committee Hansard*, 21 April 2009, p. 81.

36 Mr Timothy McAuliffe, *Proof Committee Hansard*, 1 May 2009, p. 25.

37 Mr Bradley Teys, *Proof Committee Hansard*, 28 April 2009, p. 11.

38 Ms Meghan Quinn, *Proof Committee Hansard*, 1 May 2009, p. 86.

> today… there is quite a probability that they will have a carbon price by 2015 or 2020.[39]
>
> The relative magnitude of leakage varies across different models, depending on the assumptions, and it can be somewhere between five per cent and 20 per cent.[40]

Assistance to emissions-intensive, trade-exposed industries (EITEs)

4.81 The government has recognised the need to provide assistance to industry in the *White Paper*. The *White Paper* stated:

> Australia's adoption of a carbon constraint before other countries may have a significant impact on its emissions-intensive trade-exposed industries. The Government is committed to providing assistance to these industries to reduce the risk of carbon leakage and provide them with some transitional assistance.[41]

4.82 The Government proposes to provide free permits to some EITEs. The permits provided will be based on the industry's historic average emissions intensity, avoiding penalising individual firms who are lower than average polluters and retaining an incentive for firms to cut emissions. Assistance will be linked to production: expanding firms will receive an increased number of permits and contracting firms will receive fewer permits. A firm which ceases to operate in Australia will no longer receive permits.

4.83 Firms that are able to produce the same quantity of output with fewer permits than are provided will be able to sell the difference. In effect, they will receive credit for performance better than the baseline. Firms with emissions above the baseline level will have to buy additional permits. To some extent this part of the CPRS operates like a 'baseline and credit' or 'intensity' system, and is subject to some of the criticisms made about such schemes.[42]

4.84 Trade exposure will be assessed based on either having trade share (average of exports and imports to value of domestic production) greater than 10 per cent in any year 2004–05 to 2007–08 or a 'demonstrated lack of capacity to pass through costs due to the potential for international competition'.[43] Emissions intensity refers to emissions relative to either revenue or value added, averaged over the lowest four years from 2004–05 to 2008–09.

4.85 The initial assistance announced in the *White Paper* envisaged permits to the value of 90 per cent of the allocative baseline for activities with emissions intensity

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39 Professor Stephen Howes, *Proof Committee Hansard*, 20 May 2009, p 51.

40 Dr David Pearce, *Proof Committee Hansard*, 16 April 2009, p. 8.

41 *White Paper*, p. 12-1.

42 The operation of 'baseline-and-credit' systems is described and critiqued in Chapter 3.

43 *White Paper*, p. lxxv.

above 2000 tonnes CO_2e per million dollars of revenue or 6000 tonnes CO_2e per million dollars of value added. Permits to the value of 60 per cent of the allocative baseline would have been provided for activities with emissions intensity of 1000 to 2000 tonnes CO_2e per million dollars of revenue or 3000 to 6000 tonnes CO_2e per million dollars of value added.

4.86 The *White Paper* suggests that, for example, aluminium smelting and integrated iron and steel manufacturing are likely to qualify for the 90 per cent assistance and alumina refining, petroleum refining and LNG production as likely to qualify for 60 per cent assistance. If the CPRS is extended to cover agriculture, it is likely that beef cattle, sheep, dairy cattle, pigs and sugar cane would qualify for assistance.[44]

4.87 The changes announced by the Government on 4 May 2009 increase these assistance rates for at least five years. Under what the Government refers to as the 'Global Recession Buffer', those firms previously eligible to receive 90 per cent free permits will now receive 95 per cent while those previously eligible for 60 per cent will now receive 66 per cent.

4.88 The 66 and 95 per cent assistance rates will be gradually scaled down over time, by an arbitrary 1.3 per cent a year.[45] Some industries doubt that they will be able to achieve 'carbon productivity' improvements at this rate:

> For aluminium smelting, annual ongoing improvement rates of 1.3 per cent are technologically unachievable. Australia's aluminium smelters currently are run at or close to benchmark performance levels on an international scale.[46]

4.89 The Committee notes that in New Zealand the phase out of free permits does not start until after 2018.[47]

4.90 The argument for concentrating assistance on the EITEs is that other industries will not be adversely affected:

> …if they are not emissions intensive then the costs they will face will be very low. If they are not trade exposed, that means that all participants in

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44 *White Paper*, p. 12-45.

45 The reduction is 1.3 *per cent*, not *percentage points*. So the rate in the second year is 60*(1–0.13)=59.2 per cent, not 60–1.3=58.7 per cent. This also means the rate will never reach zero.

46 Mr Steve Hodgson, President and Chief Executive Officer, Bauxite and Alumina, Rio Tinto Alcan, *Proof Committee Hansard*, 28 April 2009, p. 127.

47 It then reduces linearly until it reaches zero in 2030; www.climatechange.govt.nz; 'Questions and answers'.

> that industry in Australia will face similar costs and they can raise prices and pass it on to the community.[48]

Elaboration on five-yearly reviews of EITE assistance

4.91 The Government has announced that in conducting the five-yearly reviews of EITE assistance, the Expert Advisory Committee will consider:

> (a) the review of eligibility assessment for activities (e.g. taking into account falls in commodity prices etc as outlined in policy position 12.8 in the *White Paper*);
>
> (b) whether modifications should be made to the EITE assistance program on the basis of whether it continues to be consistent with the rationale for assistance or is conferring windfall gains on entities conducting activities;
>
> (c) the extent to which the Scheme has resulted in an increase in the cost of electricity and the extent of pass through to EITEs;
>
> (d) the extent to which EITE firms are making progress towards world's best practice energy and emissions efficiency for their industry sector;
>
> (e) the future shape of the permit price cap, recognising the need to balance the development of market mechanisms and business certainty;
>
> (f) international developments, including the extent to which Australia has entered international agreements, tangible emissions abatement commitments have been made by countries which compete with EITE industries, and major partners or competing countries have introduced carbon constraints into their own economies; and
>
> (g) whether broadly comparable carbon constraints (whether imposed through an explicit carbon price or by other regulatory measures) are applying internationally, at either an industry or economy-wide level, or an international agreement involving Australia and all major emitting economies is concluded, in which case the Committee would make recommendations to Government with regard to the withdrawal of EITE assistance; this assessment will draw on analysis by an independent expert body (initially the Productivity Commission) of quantitative measures of carbon prices or shadow carbon prices in major economies. [49]

Critiques of the free permits to EITEs

4.92 Criticism of the assistance programme has come from companies who argue it still leaves them disadvantaged relative to international competitors. For example,

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48 Dr Martin Parkinson, *Senate Standing Committee on Economics, Proof Committee Hansard*, 18 March 2009, p. 17.

49 Prime Minister, Treasurer and Minister for Climate Change and Water, Media release, 4 May 2009, p. 4.

representatives of the LNG industry gave evidence that the proposed level of assistance is not adequate for their sector:

> As the world's cleanest fossil fuel, with a major role to play in reducing global greenhouse emissions, it is our view that LNG projects should be nurtured rather than constrained. Anything less than a 100 per cent permit allocation until competitor countries are subjected to a carbon cost will disadvantage and tend to constrain Australia's LNG industry.[50]

4.93 Mr Frank Topham of Caltex Australia Ltd presented evidence to the committee concerning the inadequacy of EITE assistance in his sector.

> …we suggest that until overseas competitors have equivalent carbon costs then there should be no effective carbon costs imposed on Australian refineries. Under the CPRS that could be done by way of the allocation of free permits.[51]

4.94 The Minerals Council of Australia presented evidence to the Standing Committee on Economics that most its industry remained unshielded:

> The changes marginally raise the level of support for the now infamous emissions-intensive trade exposed industries, but that shielding is still below that provided or proposed by other nations, severely undermining our international competitiveness. In addition, those changes are simply irrelevant for nine out of 10, or 90 per cent, of Australia's minerals exports, which receive no shielding and, therefore, will face the highest carbon costs in the world—again, that our competitors do not face.[52]

4.95 The coal industry also provided evidence that it was not adequately assisted. The situation of the coal industry is discussed in further depth below.

4.96 Mr Charles McElhone, Manager, Trade Policy and Economics, National Farmers' Federation provided evidence to the committee that the short term impact of the CPRS on the supply chain for the agriculture sector had not been adequately considered:

> Senator CASH—In your opening statement, you commented that the agriculture industry is not covered but affected—in other words, the CPRS is at this particular point in time not going to cover you until 2015. Can I get a better understanding of why you are saying that your industry is affected prior to this time?
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> …

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50 Mr Robert Cole, Woodside Energy, *Proof Committee Hansard*, 28 April 2009, p. 61.

51 Mr Frank Topham, Caltex Australia, *Proof Committee Hansard*, 21 April 2009, p. 81.

52 Mr Mitch Hooke, Chief Executive Officer, Minerals Council of Australia, *Proof Legislation Committee on Economics Hansard (Inquiry into the Carbon Pollution Reduction Scheme Bill 2009 and other related bills)* , 29 May 2009, p. 34.

> Mr McElhone—Basically, if you look at the cost profile of the Australian farming sector, such as the cropping sector, about 45 per cent of our costs are energy or energy dependent. So we are talking about fuel use, electricity use, crop contracting and fertiliser use. All those costs will be affected.
>
> Senator CASH—When you say 'affected', do mean negatively or positively?
>
> Mr McElhone—All those costs will go up. At the same time, it should be acknowledged that with such an internationally exposed sector and, disappointingly from our perspective, a real incapacity to pass on those costs as a result, even small increases in cost are going to have large ramifications on our competitiveness to export. We export about two-thirds of what we produce. From that perspective, we will be affected upfront.[53]

4.97 Other witnesses in their evidence argue that the assistance, especially after the Government increased it in its 4 May announcement, is excessive:

> I think the assistance was already excessive. Of course, it benefits a vociferous and influential group of companies who have spent a lot of time and money to convince the community that action is very expensive and that handing them billions of dollars of free permits is in the public interest. I do not believe it is. Indeed, even before the additional largesse…some highly emitting firms in the 90 per cent bracket actually being better off under the CPRS package than if there was no action on climate change at all… firms with emissions that are below industry average but still much higher than other parts of the Australian economy—but lower than their very high-emitting counterparts—stand to receive more permits than their total emission liabilities…firms will have opportunities to reduce their emissions in light of carbon pricing but will be given the historic industry average.[54]
>
> …we are seeing a lot of innovation at the moment, but it is lobbying innovation, and that appears to be where the returns are in the governance arrangements as they currently stand.[55]

4.98 Other witnesses gave evidence that the extent of free permits to large polluters is unfair. For example, the Committee received over form letters, prepared by the Australian Greens, arguing:

> The CPRS as is stands is a pay-the-polluter scheme, not a polluter-pays scheme. By providing Australia's worst polluters with billions of dollars of compensation in cash and free permits to pollute, the CPRS will protect the profits of Australia's worst climate offenders at the expense of clean industries.

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53 *Proof Committee Hansard*, 15 April 2009, p. 9.

54 Mr Salim Mazouz, *Proof Committee Hansard*, 20 May 2009, pp 44-45.

55 Dr Iain MacGill, *Proof Committee Hansard*, 1 May 2009, p. 67.

> It also unfairly transfers the cost of reducing emissions to industries with less lobbying power and to the community at large. Every dollar of compensation that goes to polluters is a dollar less to assist householders and clean industries.[56]

4.99 Similar points were made in many individual submissions.[57]

4.100 It is noted by the Committee that despite raising their objection to the extent of the issue of free permits, no solution was put forward as to how to address the concerns raised by industry in relation to their potential to be disadvantaged relative to international competitors.

4.101 Some witnesses from the financial sector opined that the proposed assistance in the CPRS would be adequate to address concerns about carbon leakage, so that the impact of the scheme on companies would be manageable:

> We looked at industries including steel, cement, aluminium and LNG. We concluded that the scheme's impact was generally in the order of one to five per cent of company value or a little more under some scenarios.[58]

> …our members believe that transitional assistance is necessary for trade-exposed sectors and consider that the revised arrangements leave exposed companies with negligible financial impacts in the short to medium term. Research by Goldman Sachs JBWere…has shown that the financial impact of the CPRS will be minimal for listed Australian companies.[59]

Impact on competitiveness

4.102 Many industry submissions argued that Australian firms will be unable to compete internationally if they are required to meet the cost of their carbon emissions while foreign competitors in the developing world are not. Ms Belinda Robinson of the Australian Petroleum Production and Exploration Association provided evidence to the Committee:

> It remains the case, even after the Prime Minister's recent announcements, that the industry will be subject to a significant cost burden that is not borne by its LNG competitors—including countries such as Qatar, Algeria, Nigeria, Trinidad and Tobago, Egypt, Brunei, Indonesia, Malaysia, Oman and the United Arab Emirates—or our customers. This means a constraint to growth and a consequent increase in global emissions as less Australian natural gas is made available to the world. We do not believe that this is the

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56 *Submission FL1*, p 1.

57 See for example Ms Lindy McMahon, *Submission 89*, p. 1; Mieke Elzer, *Submission 191*, p. 1; and Mr Doug McIver, *Submission 551*, pp 1–2.

58 Ms Elaine Prior, Citi Investment Research, *Proof Committee Hansard*, 20 May 2009, p. 83.

59 Mr Nathan Fabian, Chief Executive Officer, Investor Group on Climate Change, *Proof Committee Hansard*, 20 May 2009, p. 61.

> outcome that should reasonably be expected from any policy that has as its core an objective to reduce emissions.[60]

4.103 Mr Ralph Hillman, Executive Director of the Australian Coal Association, provided the following evidence to the committee:

> Notwithstanding the poorer quality of Indonesian coal, our friends in New Zealand prefer it to Australian coal. Notwithstanding their infrastructure problems, it was because of the flexibility of their mining operation compared with ours which requires massive railways and massive port facilities whereas they can just throw it on a barge and then onto a boat. That is how they stole 15 per cent of our export market. The thing is that coal is everywhere. Most countries have coal and there is a vast range of countries in a position to export it and in a position to beat us on a cost basis, so every cent counts. Of course, every country has its advantages and disadvantages. Australia has superb quality coal. We are a properly regulated economy. We have some very good infrastructure; we have a lot of things going for us, but we also have higher labour costs. Our mines are getting further and further inland from the coast. Our mines in the Hunter Valley, for example, are getting deeper; therefore gassier and more expensive to operate. Our mines in the Illawarra are getting deeper and deeper, gassier and more expensive to operate. So it is a dynamic situation and every little thing you load onto the industry makes it harder for the industry.[61]

4.104 Other witnesses regarded this as overstated, pointing to the operation of the floating exchange rate.[62]

Transitional assistance to EITEs

4.105 As noted above, as well as carbon leakage, the Department of Climate Change justified assistance to EITEs as follows:

> …the government is attempting to smooth the transition for individual firms, rather than just have them take a hit on their profit.[63]

4.106 Some other submitters also explained the need for transitional assistance:

> The draft legislation clearly demonstrates to us an appreciation of the fact that the Australian economy will require a period of transition to become a low-carbon economy. There is also a recognition of the potential

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60 Ms Belinda Robinson, Australian Petroleum Production and Exploration Association, *Proof Committee Hansard*, 30 April 2009, p. 65.

61 Mr Ralph Hillman, Executive Director, Australian Coal Association, *Proof Committee Hansard*, 30 April 2009, p. 79.

62 Dr Richard Denniss, Director, the Australia Institute, *Proof Committee Hansard*, 30 April 2009, p. 51.

63 Dr Martin Parkinson, Secretary, Department of Climate Change, *Senate Standing Committee on Economics, Proof Committee Hansard*, 18 March 2009, p. 26.

> competitiveness at threat for some aspects of the Australian industry. We can also see evidence in the legislation that the government has considered the emissions trading schemes in other jurisdictions and has looked to learn from the mistakes and some of the challenges that have been experienced with those schemes.[64]
>
> The overriding consideration for the AWU has been to ensure that the EITE industries most exposed to the impacts of the ETS, and least able to pass on costs associated with participation in the Scheme have the maximum level of assistance during the transition to an international framework for emissions trading (which includes both developed and developing countries) on a true burden sharing basis.[65]

Additional assistance to the coal mining industry

4.107 Coal mining is excluded from EITE assistance. The *White Paper* provided the following explanation:

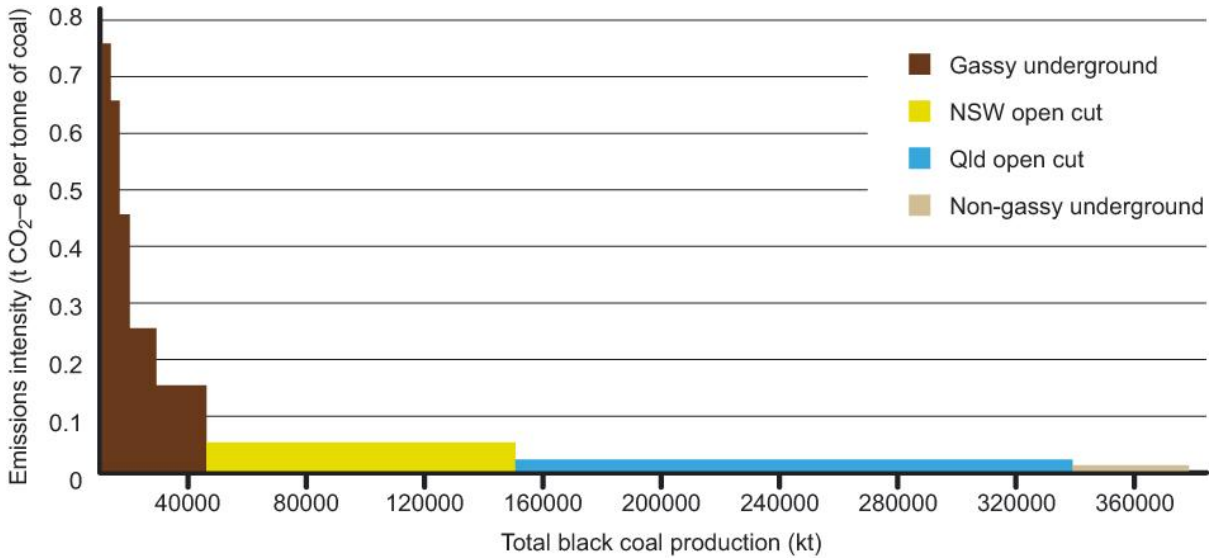
> Since the majority of coal mines are not emissions-intensive, the Government will not provide EITE assistance to the activity of coal mining. (An allocation based on the industry average would lead to the majority of coal mines receiving significant windfall gains.) However, a small number of coal mines are very emissions-intensive and will face a significant cost impact from the Scheme. The Government will allocate up to $750 million from the Climate Change Action Fund to facilitate abatement and assist with the transition of these coal mines.[66]

64 Ms Amanda McCluskey, *Senate Standing Committee on Economics*, *Proof Committee Hansard*, 25 March 2009, p. 48.

65 Australian Workers Union, *Senate Standing Committee on Economics Submission 27*, p. 3.

66 *White Paper*, p. 12-46.

Chart 4.2: Black coal mine fugitive emissions intensity (2006-07)



Source: *White Paper*, p 12-46.

4.108 As set out in the *Select Committee on Fuel and Energy Interim Report*:

> Coal is Australia's largest commodity export, earning over $40 billion in 2008. Australia is also the world's largest exporter of coal, exporting over 250 million tonnes in 2008. The black coal industry employs over 30,000 Australians directly and a further 100,000 indirectly. It provides 57 per cent of our electricity generation. When we add in brown coal, that figure rises to over 80 per cent. Coal therefore underpins the security, reliability and comparatively low cost of Australia's electricity supply. In turn, this supports the competitiveness of Australian industry and provides affordable power for Australian households.[67]

4.109 The Government decided to treat coal as a special case. However, this reasoning was not accepted by the black coal industry's representatives:

> We are just asking for fair treatment under the CPRS and under the ET arrangements. Coal clearly meets the white paper eligibility criteria for a 60 per cent permit allocation.[68]

4.110 The black coal industry's response to the issue of 'windfall gains' was to suggest:

> …instead of allocating permits mine-by-mine according to each mine's production you actually recognise the coal industry is different from

67 Mr Burt Beasley, Acting Executive Director, Australian Coal Association, quoted in *Select Committee on Fuel and Energy, Interim Report: The CPRS: Economic cost without environmental benefit*, May 2009, p. 140.

68 Mr Ralph Hillman, Executive Director, Australian Coal Association, *Proof Committee Hansard*, 30 April 2009, p. 181.

> cardboard box manufacturing or aluminium production, you allocate them according to each mine's emissions…[69]

4.111 The Government intends to allocate up to $750 million in targeted assistance to the coal industry, around two-thirds of which will go to 'gassy mines' to assist in the installation of abatement equipment.[70] This is well below the assistance the industry would receive were it to be treated as an EITE.

Assistance to electricity generators

4.112 The Government will assist electricity generators through the Electricity Sector Adjustment Scheme (ESAS), which will provide an amount of free permits, worth about $4 billion over five years.

4.113 The Energy Supply Association of Australia argued that this is well below the damage they will suffer as a result of the CPRS:

> The government has effectively short-changed the industry by tabling only $3.5 billion in its *White Paper*. This is likely to result in distress across multiple coal-fired assets and it will affect both debt and equity stakeholders... I think you are looking at more like between $10 billion and $20 billion. It is $10 billion, according to two out of the three models by Treasury, to 2020.[71]

> The CPRS needs to adequately address the stranding of coal-fired generation assets. A measured transition to full auctioning, as proposed in most other schemes to date, would enable a greater volume of permits to be administratively allocated to affected generators to ensure there is no disproportionate loss of economic value on the sector's balance sheets which would compromise both the ability to refinance existing assets and to make new investments.[72]

4.114 The Association warned that the CPRS was a threat to the solvency of some generators:

> I am concerned that coal-fired assets in particular will find their cost base significantly increased, some by a 200 to 400 per cent increase depending on the CO_2 price. In turn that will result in insolvency or near insolvency and certainly a reduced ability to do maintenance. In turn that could lead to reduced energy security or energy supply. It would certainly increase energy security risk.[73]

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69 Mr Ralph Hillman, *Proof Committee Hansard*, 25 March 2009, p. 182.

70 *White Paper*, p. 12-46.

71 Mr Tony Concannon, *Proof Committee Hansard*, 30 April 2009, p. 78.

72 Ms Clare Savage, *Proof Committee Hansard*, 28 April 2009, p. 31.

73 Mr Tony Concannon, *Proof Committee Hansard*, 30 April 2009, p. 46.

4.115 Other witnesses referred to the problems that were being caused for firms wishing to fund investment from international lenders:

> …ERM Power is now marking time before proceeding to arrange finance …The $1.8 billion of finance for these projects will not be obtainable unless lenders and investors are reassured that the Australian electricity sector can maintain its high credit rating. Although the threat of properly made investments in coal fired power stations being stranded does not affect gas fired generators… the remaining international lenders are even more sensitive to changed country risk and particular sector risks.[74]

4.116 The Government argument for the ESAS assistance is that the CPRS:

> …will impose a new cost on fossil fuel-fired electricity generators…relatively emissions-intensive generators are likely to face a greater increase in their operating costs than the general increase in the level of electricity prices…[and] lose profitability…if investors consider that the regulatory environment is riskier…all investments in the sector could face an increased risk premium.[75]

4.117 The justification for ESAS is that a government decision has 'changed the rules' and so the affected companies should be compensated.

4.118 An alternative view is that compensating the generating companies for a reduction in the value of their assets would represent a change to the standard approach of Australian governments.[76] Professor Garnaut commented:

> There is no public policy justification…Never in the history of Australian public finance has so much been given without public policy purpose, by so many, to so few.[77]

Treatment of voluntary/additional emission reductions

4.119 The committee received hundreds of submissions objecting to the effect of the proposed CPRS on households and businesses' voluntary actions to reduce their greenhouse gas emissions.[78] The submissions highlighted the fact that under the proposed CPRS, households' voluntary actions will not affect the overall level of emissions.

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74 Mr Trevor St Baker, ERM Power, *Proof Committee Hansard*, 28 April 2009, p. 77.

75 *CPRS Bill Commentary*, pp 133-4.

76 Professor John Quiggin, *Proof Committee Hansard*, 28 April 2009, p. 17.

77 Professor Ross Garnaut, cited in 'Oiling the squeaks', *Sydney Morning Herald*, 19 December 2008, p. 25.

78 Households are major emitters, responsible through their energy and fuel use for around 25 per cent of emissions covered by the CPRS. Commercial services and government sectors are responsible for a further 10 per cent as a result of their electricity use.

4.120 In this context, 'voluntary' action refers to things that are done for (or primarily motivated by) altruistic concerns about the environment rather than (just) in response to a price signal.

4.121 For example, electricity consumers who opt to pay more for electricity derived from renewable sources rather than fossil fuels. Another example is the installation of solar panels where the installation costs exceed the savings on power bills.

4.122 For example, under the Government's original proposal, a household that chooses to buy the more expensive option of GreenPower will lead their electricity supplier to make fewer emissions and need fewer permits. This would mean that there are more permits for other polluters to purchase and increase their emissions. As such, the CPRS would act as a disincentive for households, and the many businesses not covered by the scheme, to reduce their carbon footprint. Any voluntary actions that these groups do make will not lead to a reduction in Australia's greenhouse gas emissions.

4.123 This situation was also highlighted in several submissions to the Senate Economics Committee as part of its inquiry into the Exposure Draft of the bill.

4.124 The Economics Committee observed:

> The growing perception that the CPRS negates actions taken by individual households to reduce emissions is eroding support for the scheme. This must be addressed.[79]

Views on the voluntary action issue

4.125 Many individuals and organisations identified a key concern with the proposed CPRS as its failure to take into account the voluntary actions of households, (non-liable) businesses and state and territory governments. The committee received a form letter, prepared by the Australian Greens, from over one thousand submitters stating:

> In addition to setting such a weak 5% target, the CPRS also fails to take into account voluntary emission reductions from the community. The efforts of everyone from householders to State Governments to reduce emissions will be helpful only in reducing the price pressure on polluters. This must be fixed by taking account of community action and all the policies already in place when setting the scheme caps, and using the scheme to drive more ambitious efforts.[80]

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79 See Senate Economics Committee, *Exposure draft of the legislation to introduce the Carbon Pollution Reduction Scheme*, April 2009, p. 73.

80 Form letter, *Submission 5*, see http://www.aph.gov.au/Senate/committee/climate_ctte/submissions/sublist.htm

4.126 A small sample from the hundreds of individual submissions from concerned citizens say:

> It is also of concern that the CPRS, as proposed, does not take into account voluntary emission reductions from the community. The efforts of everyone from householders to State Governments to reduce emissions will be helpful only in reducing the price pressure on polluters. This must be fixed by taking account of community action and all the policies already in place when setting the scheme caps, and using the scheme to drive more ambitious efforts.[81]

> I have recently upgraded my home to be as energy efficient as possible, and have installed solar hot water and a photovoltaic system for renewable electricity. I am dismayed to find that, with the CPRS in its current form, my actions (and considerable money spent!) amount to nothing. They essentially just free up permits for polluters.[82]

> My family and I have gone to considerable effort and expense to reduce our carbon emissions, such as installing a solar water heater and photovoltaic grid interactive solar panels. We think it is scandalous that the government's proposed carbon trading scheme would not take such efforts into consideration, and that they would in fact allow polluters to pollute more. Such efforts should be encouraged by the government, not undermined by such poor policy.[83]

> Ordinary Australians are willing to assist with reducing Australia's carbon footprint and their contribution should not enable big polluters to pollute more, but should make a measurable difference. Otherwise, I fear that householders and small business will fail to see the point in doing their bit for the environment or paying the extra for the CPRS.[84]

> If a cap and trade system is chosen, it must recognise the benefits of voluntary actions and not allow these to do the job of the big polluters. The cap should be lowered by the amount of voluntary reductions achieved by individuals and businesses.[85]

4.127 Several organisations also voiced their concerns.

4.128 The Executive Director of the Australian Conservation Foundation, Mr Don Henry told the Committee:

> I think there is a problem with voluntary action. The Australia Institute has raised it and companies like Origin have raised it, as have many of the green power providers. I think it is really important that people know that

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81 Jo Mead, *Submission 88*.

82 Ms Caitlin McGee, *Submission 66*.

83 Jim and Clare Rourke, *Submission 170*.

84 Ms Fiona Brady, *Submission 65*.

85 Mr Michael Hassett, *Submission 117*.

> what they do can make a difference. It is an important motivating factor, and that is also why we would have the view that other complementary or additional measures are really important here…There are things that we need to be doing, and a price signal through the proposed CPRS, for example, will not be adequate alone, and action is required. You have to ensure, whether it is an individual household or a commercial building doing a retrofit, that they can see the benefit of their action, or are required to act.[86]

4.129 The South Australian Government argued in its submission that the design of the CPRS could be improved by providing for recognition of some forms of abatement action undertaken on a voluntary basis by households and individuals. It identified the purchase of GreenPower and the installation of solar panels as the principal actions which should be recognised. The submission noted three reasons why voluntary action must be taken into account. First, it is important to capture 'a particularly cheap form of abatement'. Second, recognition of voluntary action directly supports investment in clean energy, energy efficiency and jobs. And third, the exclusion of voluntary action means that the commitments of state governments and corporations to voluntary action are no longer encouraged.[87]

4.130 The ACT government also argued in its submission that the programmes of state and territory governments which reduce greenhouse emissions beyond levels required by the CPRS should be recognised in the scheme. The Territory's Environment Minister, Mr Simon Corbell MLA, expressed 'significant concern' that state and territory jurisdictions may not be able to implement more stringent climate change policies. He urged the Commonwealth Government to investigate how these efforts by states and territories can meaningfully contribute to reducing greenhouse gases.[88]

A design feature

4.131 Other witnesses did not view the voluntary action issue as a problem. Dr Frank Jotzo, an economist at the Australian National University, argued in his submission that the alleged oversight of voluntary abatement efforts is not a design fault of the CPRS. Rather:

> Individual action is an integral part of achieving a national emissions reduction target at least cost, and it will be encouraged by rising energy prices. The more individuals do to reduce their greenhouse gas footprint, the easier it will be for Australia collectively to meet any national emissions target. That in turn will make it possible to go for more ambitious national

86 Mr Don Henry, *Proof Committee Hansard*, 22 April 2009, p. 64.

87 Government of South Australia, *Submission 521*, pp 3–4.

88 ACT Government, *Submission 462*, p. 1.

> targets down the track. That of course requires flexibility in being able to ratchet down targets in the future, and the political preparedness to do so.[89]

4.132 In its submission to the Senate Economics Committee's inquiry into the Draft Exposure Bill, the Australian Industry Group opposed the bill's clause guiding the Minister to consider voluntary action in setting the cap:

> Ai Group does not understand what of substance is intended by including among the factors that may be taken into account in setting caps the "voluntary action"… Our understanding is that an ETS (or a carbon tax) would encourage households and businesses to reduce emissions by imposing a price… Ai Group submits that the concept of voluntary action should be removed from the list of factors that can be taken into account in setting caps.[90]

4.133 Mr David Pearce of the Centre for International Economics told the Senate Economics Committee in March this year that far from being a problem, the voluntary abatement issue was in fact a benefit of the CPRS scheme. He argued that voluntary action undertaken by households lowers the demand for permits, which lowers the price of permits and thereby makes abatement less costly for everybody.[91]

Possible ways of recognising voluntary emission reductions

4.134 The committee heard that voluntary efforts to reduce greenhouse gas emissions should be accounted for in a systematic and structured way. Mr Timothy Hanlin, Managing Director of Australian Climate Exchange Limited, stressed the need for a government sponsored voluntary emissions trading scheme. He explained:

> We believe that the CPRS needs mechanisms that, for instance, buy back permits from the market and therefore maintain the cap equivalent to the reductions that are achieved in that voluntary emissions trading scheme. We also believe that at least five per cent additional reduction by 2020 could very easily and conservatively be achieved through voluntary measures. We point to Europe and the fact that post the introduction of an EU emissions trading scheme, Europe has been the largest market growth in voluntary emissions trading of anywhere else in the world.[92]

4.135 Dr Richard Denniss has argued that the Exposure Draft of the CPRS bill should be amended to allow the number of permits to be reduced each year directly in line with the amount of pollution saved by voluntary action. The creation of a secondary market of permits based on households' emissions reductions would enable household emission reduction permits to be exchanged for CPRS permits. To account for difficulties in the accuracy of household emissions measurements, Dr Denniss

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89 Dr Frank Jotzo, *Submission 414*, p. 4.

90 Australian Industries Group, *Submission 90*, p. 5.

91 Mr David Pearce, *Proof Committee Hansard*, 25 March 2009, p. 92.

92 Mr Timothy Hanlin, *Proof Committee Hansard*, 20 April 2009, p. 19.

proposes that secondary market permits be exchanged for CPRS permits at a fixed rate of 2 to 1. If two tonnes of household permits was exchanged for a tonne of CPRS permits, 'it is impossible for the secondary market in household efficiency permits to dilute the value of CPRS permits so long as the measurement error is less than 50 per cent'.[93]

4.136 The Centre for Energy and Environmental Markets at the University of New South Wales has proposed that voluntary action could be recognised through an Additional Action Reserve (AAR). The AAR would annually set aside a proportion of emission units which would be retired if governments, businesses or individuals take emission reduction measures which go beyond a baseline target that emitters are expected to achieve. Through setting aside a fixed proportion of units annually, the Action Reserve would limit recognition of voluntary action and limit potential losses of auctioning revenue. If the allocated emission units are not retired in a given year, they would be returned to the market. The Centre argues that a scheme along these lines would provide a mechanism for 'defined and limited' strengthening of the national emission target which would drive domestic emission reductions rather than potentially draw on international carbon credit markets.[94]

The CPRS Bill 2009

4.137 The CPRS Bill and Explanatory Memorandum have made two broad changes to the Exposure Draft legislation and Commentary in relation to the voluntary abatement issue.

4.138 Evidence was given by Mr Blair Comley, Deputy Secretary of the Department of Climate Change, as follows:

> There are really two broad changes that have been made since the exposure draft. The first change relates explicitly to green power and that is making a commitment by the government that increases in green power above a 2009 baseline would be subtracted from the cap in the future cap-setting process. That is an explicit commitment about green power above and beyond general voluntary action. The second change, which is more a change of explanation and emphasis, is that the explanatory memorandum provides significantly more information than there was in the exposure draft about the way in which voluntary action would be intended to be taken into account. That was really an elaboration of what the government had in mind in the exposure draft bill making it clear that it would monitor a range

93 Dr Richard Dennis, 'Fixing the floor in the ETS: The role of energy efficiency in reducing Australia's emissions', *Research Paper No. 59*, The Australia Institute, November 2008, p. 10.

94 Dr Regina Betz, *Proof Senate Economics Committee Hansard*, 27 March 2009, p. 118. Centre for Energy and Environmental Markets, 'The possible role of an Additional Action Reserve (AAR) in the CPRS to facilitate additional voluntary and policy efforts to reduce emissions', *Concept Note*, p. 1.

> of different indicators of voluntary and individual action and that would feed into the future cap-setting process.[95]

4.139 As noted earlier, additional GreenPower purchases above 2009 levels will be directly recognised when the government sets the caps. Additional GreenPower purchases will be measured annually and future caps will be tightened on a rolling basis. The Explanatory Memorandum to the CPRS Bill states:

> The Government has indicated that additional GreenPower purchases will be measured annually and taken directly into account in setting scheme caps five years into the future, on a rolling basis. For example, the 2016-17 cap will be tightened to reflect the difference between 2009 and 2011 GreenPower sales, multiplied by a factor to reflect the emissions saved. This will achieve emissions reductions beyond Australia's national targets as it will be backed by the cancellation of Kyoto units.[96]

4.140 Mr Comley also gave evidence that the Explanatory Memorandum gives greater detail on the types of voluntary actions that the Government will monitor and take into account when setting scheme caps and gateways.

4.141 The Explanatory Memorandum states:

> A range of other indicators of voluntary action may also be taken into account. As a matter of policy, the Government will monitor annual emissions from the household sector, and will monitor and consider the uptake of certain energy efficiency activities among households and businesses where there are clearly defined business-as-usual benchmarks, and where improvements can be detected. In doing so, the Government will consider trends in the construction or renovation of houses to a star-rating above the minimum required, the use of public transport and the expansion of public transport services, and the uptake of more energy efficient appliances (particularly those that consume a significant proportion of household energy such as water heaters and airconditioners) beyond regulated levels. Action in these sectors could be taken into account by assessing the extent to which the uptake exceeds historical trends, factoring in electricity price changes, regulation and any direct government assistance.
>
> For example, the Government would collect data on the proportion of houses with a 6 star rating that are being constructed, compare this with historical trends and calculate the reduced emissions likely over the full life-cycle of the buildings. This calculation could inform the Government's cap setting decision. Another example could be monitoring the overall fuel efficiency of the passenger vehicle fleet in Australia. The trend improvements in fuel efficiency could then be compared to historical trend improvements, taking account of fuel price changes and other relevant

95 Mr Blair Comley, *Proof Committee Hansard*, 20 May 2009, p. 12.

96 *Explanatory Memorandum*, p. 80.

> factors. Estimates of emissions reductions could then be used to inform the Government's decision regarding appropriate scheme caps and gateways. [97]

4.13 The EM does recognise that it is not possible to list all household and individual actions that could be measured and taken into account by the Minister. It notes that these 'may evolve over time in response to changing carbon prices, technological developments and other economic and social developments'.[98]

The Australian Carbon Trust

4.142 As part of a suite of changes to the Exposure Draft legislation announced on 4 May 2009, the Government proposed to establish an Australian Carbon Trust. The stated purpose of the Trust is 'to help all Australians to do their bit to reduce Australia's carbon pollution and to drive energy efficiency in commercial buildings'.

4.143 The Trust will have two components: a $50.8 million Energy Efficiency Trust and a $25.8 million Energy Efficiency Savings Pledge Fund. The Pledge Fund will enable households to calculate their energy use and retire carbon pollution permits. The Government will establish a website for this purpose and the pledges will be pooled with all contributions tax deductible. The Energy Efficiency Trust will provide funding to cover upfront capital costs for businesses seeking to undertaking energy efficiency measures. Businesses would pass the cost savings back to the Trust at a commercial rate until the borrowed costs (with interest) are repaid.[99]

4.144 A Government Media Release dated 4 May 2009 stated:

> A new website will provide a one-stop shop for individuals and households to simply calculate their energy use and buy and retire carbon pollution permits under the Carbon Pollution Reduction Scheme…The Pledge Fund will be entirely voluntary and contributions to the Pledge Fund will be tax deductible.[100]

Responses to these measures

4.145 The committee sought comment on how effective the Pledge Fund would be in resolving the voluntary action issue.

4.146 Dr Denniss remains a strong critic:

> The proposal that was put forward is bizarre—that is the only way to describe it. The notion that individuals who make decisions to use less energy—be that through transport or in their household—would log on to a

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97 CPRS Bill Explanatory Memorandum, p. 80.

98 CPRS Bill Explanatory Memorandum, p. 81.

99 Once the initial capital cost has been repaid, the business keeps the ongoing cost savings from its investment.

100 The Hon. Kevin Rudd, 'Helping all Australians do their bit on climate change', *Media Release*, 4 May 2009.

> website, calculate how much money they had saved on their electricity bill, donate that money to Kevin Rudd and that he in turn would go and purchase a permit from someone that they recently gave it to for free is just inexplicable—bizarre. Add to that the fact that people might have spent extra money of their own on buying a Prius or installing insulation in their house, if they did not get the thing, or installing a solar panel—people are spending their own money. And then, if they save electricity, they are expected to donate money to the federal government. As to the argument, 'At least it is tax deductible now': it was always tax-deductible if you donated it to an environment group who went and purchased the permit. But the idea that the solution to this is to purchase a permit…to pay twice—is just inexplicable.[101]
>
> …
>
> let us just stop the lying to consumers who are picking up the tab through higher electricity prices through the MRET, through higher taxes that are going to be needed to provide business with the certainty they are after and through the fact that we are telling them to go and spend their money on abatement measures that are not going to abate emissions at all.[102]

4.147 Other witnesses also identified the flaw in forcing households to 'pay twice'.

4.148 Mr Russell Marsh of the Clean Energy Council told the committee:

> The creation of the energy efficiency savings pledge fund appears to be asking consumers to pay twice for carbon savings—firstly, when they pay to install a certain bit of energy efficiency or renewable energy equipment and, secondly, to have those permits retired from the market. It is not quite clear exactly how that is going to work, but at first glance it appears to be asking consumers to pay twice. There is a particularly strong case to look at retiring permits associated with the installation of solar PV on households. This is a technology that is getting a lot of financial support from the government. There is a rebate scheme—the Solar Homes and Communities Plan—that offers $8,000 to householders to install solar PV on their roofs. The main driver for people to do that, and the main driver for the government to do that, is to reduce carbon emissions. It makes sense to us to reflect that fact by being able to retire the permits that would be the equivalent to that scheme from the CPRS.[103]

4.149 Mr Salim Mazouz from EcoPerspectives disagreed with Dr Denniss' criticisms. He told the committee that the government 'did well' with its announcements in relation to the voluntary action issue. He added:

> Essentially, voluntary action has already made a difference and will continue to make a difference in reducing the cost of achieving emissions

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101 Dr Richard Denniss, *Proof Committee Hansard*, 20 May 2009, p. 41.

102 Dr Richard Denniss, *Proof Committee Hansard*, 20 May 2009, p 55–56.

103 Mr Russell Marsh, *Proof Committee Hansard*, 20 May 2009, pp 66–67.

> abatement in Australia. With regard to the reduction to cost, as you can see the whole debate on the Carbon Pollution Reduction Scheme is about how much it will cost. That is why government is not willing to do much more…Agreed, it translates in the first place into reductions in the cost of achieving emissions abatement in the rest of the economy, but nonetheless that makes a real contribution to the ability of Australia to move ahead with significant emissions cuts through time.[104]

Other design flaws

4.150 Other problems with the CPRS design that influence particular industries have been identified.

4.151 Chapter 5 of the report discusses the transition from the ETS in New South Wales to the CPRS, which may mean that operations currently making a valuable contribution to reducing greenhouse gases by using otherwise wasted methane from coal seams to generate power may no longer be viable.

Abatement activities unrecognised

4.152 The treatment of biochar is discussed further in Chapter 6.

4.153 The Select Committee on Fuel and Energy in its Interim Report has referred to cases where the CPRS does not recognise activities that contribute to reducing greenhouse gases:

> The committee considers that what matters is effective and cost effective action to reduce global greenhouse gas emissions. The accounting rules under the Kyoto Protocol are a secondary consideration. As such the committee is of the view that the design on any Australian initiative to contribute to global efforts to reduce greenhouse gas emissions should recognise and encourage all effective and efficient ways to reduce global greenhouse gas emissions irrespective of whether or not they are recognised under the Kyoto Protocol accounting rules.[105]

Treatment of landfill

4.154 The Committee heard that the landfill industry was being treated unfairly. It appeared to be the only industry that is being punished for past sins:

> …the core issue of the CPRS legislation for the waste sector is the inclusion of emissions from waste deposited prior to the implementation of the scheme. The industry calls this legacy waste emissions. This is the most vital issue as waste decomposes over decades in a landfill and as such the

104 Mr Salim Mazouz, *Proof Committee Hansard*, 20 May 2009, p. 56.

105 Senate Select Committee on Fuel and Energy, *Interim Report: The CPRS: Economic cost without environmental benefit*, May 2009, p. 76.

> inclusion of legacy waste emissions in the scheme from 2008 and onwards renders landfill owners liable for emissions which could emanate from waste that was deposited up to 50 years ago.[106]

4.155 This creates inequities between long-standing sites and new sites with no such legacy wastes. Furthermore, taxing waste disposal practices from decades ago does not influence future behaviour as the scheme aims to do. The industry suggested amending the treatment of landfill so that old landfill sites were given credit for collecting methane emissions.

4.156 The Government has now announced that the landfill industry will not be liable for emissions generated by waste dumped in the past. This has been applauded by the Australian Industry Group as a 'victory for common sense'.[107]

Western Australia

4.157 Evidence was given that the CPRS is also fundamentally flawed in that it fails to take into account the special circumstances of Western Australia. The rest of the country is part of an integrated national electricity market (NEM) whereas Western Australia is isolated and reliant on a small number of gas suppliers. This means much of the Treasury analysis assuming pass-through of higher costs is inapplicable to the WA market:

> Being in the isolated south-west interconnected system, or the SWIS, creates additional problems and concerns as opposed to being part of the NEM. It becomes more difficult for WA to dispatch renewable energy while ensuring that baseload power supplies are guaranteed.[108]

> In Western Australia we do not have a gross pool energy market… energy is [mostly] traded bilaterally; that is, in long-term contracts...The effect that has is that there is then no capability of passing through the respective emissions intensity cost [in] a spot market as there is in the NEM. Basically, the generator who has locked in prices anywhere in the last five to 10 years has to carry those costs going forward.[109]

The interim price ceiling

4.158 The *White Paper* envisages a price ceiling on permits to apply for the first five years. The ceiling will be $40 a tonne, rising by 5 per cent a year in real terms. This will be implemented by the issuance of additional permits as required. It is

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106 Mr James Spedding, Secretary, Australian Landfill Owners Association, *Proof Committee Hansard*, 22 April 2009, p. 44.

107 Australian Industry Group, Media release, 14 May 2009; *Australian Financial Review*, 15 May 2009, p. 4.

108 Mr Andrew Canion, Chamber of Commerce and Industry of Western Australia, *Proof Committee Hansard*, 20 April 2009, p. 16.

109 Mr Shane Cremin, Griffin Energy, *Proof Committee Hansard*, 20 April 2009, p. 57.

controversial as it increases the risk that Australia will either not meet its emission reduction targets or taxpayers will be forced to incur an uncertain cost of buying international permits and makes it harder for the Australian scheme to be linked to overseas schemes.[110]

4.159 Dr Regina Betz, an expert on European emissions trading, believes the limit is inappropriate, and probably unnecessary:

> The fear that the price is going to get too high seems to be going through the whole legislation, whereas the fear that the price is not going to be enough to actually drive any change is somehow not really included. As to setting the price cap, I was trying to find out what was the rationale behind the $40 that it was starting with. It is very difficult to get any information. If such figures are set wrongly we will actually not end up with the emission reductions we want to achieve and we might really end up with problems in the budget because the Kyoto target or the future international target is going to be met and then it is going to be met based on buying a certain amount of units or CERs from outside.[111]
>
> If you are linking internationally, you already have a price cap so the question is: do we need a price cap at all if we have a link to the Kyoto mechanisms? [112]

4.160 On 4 May 2009 the Government announced that in addition to the ceiling, for the first year of the CPRS' operation, permits would be issued at a fixed price of $10 a tonne. The idea of starting the scheme with a brief period of fixed price permits was raised in the *Garnaut Review*, although Professor Garnaut's suggestion was for a price of $20, much closer to the predicted market price.[113]

Adequacy of assistance to households

4.161 Ensuring that low-income families are not worse off while still maintaining price incentives for them to economise on emissions-generating activities is critical to the design of an effective emissions reduction policy.

4.162 Assistance to households is premised on the notion that, while most households will be able to adjust their behaviour to minimise the impact of a carbon price on their standard of living, those who have a low capacity to absorb or avoid the effects should be provided with direct assistance.[114]

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110 This view was put in submissions on the *Green Paper* by, for example, BP Australia and environmental groups; *White Paper*, pp 8–33, 34.

111 Dr Regina Betz, *Proof Committee Hansard*, 1 May 2009, p. 66.

112 Dr Regina Betz, *Proof Committee Hansard*, 1 May 2009, p. 66.

113 *Garnaut Review*, p. 350.

114 *White Paper*, Executive Summary, p.3.

The Government's proposal

4.163 The *White Paper* released by the Government outlined a household assistance package based on an initial assumed carbon price of $25 a tonne, projecting an increase in the average household's electricity bill by around $4–5 per week and gas and other household fuel bill by $2 per week (assuming no behavioural response).[115] The *White Paper* did not expect the introduction of a CPRS to affect petrol prices (see below).

4.164 The Government's proposed assistance includes the following:

- pensioners, seniors, carers and people with disability will receive additional support, above indexation, to fully meet the expected overall increase in the cost of living flowing from the scheme;
- other low-income households will receive additional support, above indexation, to fully meet the expected overall increase in the cost of living flowing from the scheme;
- around 89 per cent of low-income households (or 2.9 million households) will receive assistance equal to 120 per cent or more of their cost of living increase;
- middle-income households will receive additional support, above indexation, to help meet the expected overall increase in the cost of living flowing from the scheme. For middle–income families receiving Family Tax Benefit Part A, the Government will provide assistance to meet at least half of those costs;
- around 97 per cent of middle-income households will receive some direct cash assistance. Around 60 per cent of all middle-income households (or 2.4 million households) will receive sufficient assistance to meet the overall expected cost of living increase; and
- motorists will be protected from higher fuel costs from the scheme by 'cent for cent' reductions in fuel tax for the first three years.[116]

4.165 Fixing the CPRS permit price at $10 in the first year would result in the permit auction raising $5 billion rather than $12 billion expected if the permit price was $25. This would be insufficient to fund the initially planned assistance, but presumably a lower amount of compensation would be acceptable as the price impacts would also be lower.

4.166 In addition, the Government's plan involves additional payments to pensioners, seniors, carers and people with disabilities of around 1½ per cent and additional support to low- and middle-income households, through increases in the

115 *White Paper*, p. 17-2; Treasury (2008, p. xv).

116 *White Paper*, Executive Summary, p. 4.

low income tax offset, family tax benefits and dependency tax offsets and a transitional payment of $500 for some low-income singles.

4.167 There was broad consensus in the evidence given to the Committee that some sort of assistance should be paid to support low income households who are less able to adapt on their own:

> …there should be appropriate compensation for households. It is a value judgement as to how far you should go in that respect, where the money is going to come from to pay for that and what the opportunity cost of doing it is.[117]

> We regard energy efficiency as critical to both mitigation and adaptation, and we believe that there ought be a coordinated set of policies that support households, especially low-income groups…[118]

4.168 Professor McKibbin suggested that the assistance should be provided in a different form:

> I do not like the word 'compensation'. Let us preserve the balance sheets of households who have to change the way that they use energy and have to have innovations on their energy efficiency front…I believe that there should be large scale allocation of free long-term permits to those industries and households who are most affected.[119]

Ongoing offset assistance versus transitional payment

4.169 The benefits of providing assistance to certain cohorts in society (such as low income households) by increasing benefit payments rather than, for example, providing a rebate of electricity charges, were discussed during the inquiry. Professor John Quiggin said:

> I think compensation to households is desirable provided that it is given on a lump-sum basis. The point of any price change is that there is a benefit to it in terms of the increased price that some people receive and a cost.[120]

4.170 Professor Quiggin emphasised the importance of using price signals, rather than offsets, to drive behavioural change.

> For example, supposing that the price of electricity doubles and you receive a cheque in the mail…you do not go out and spend that money on more electricity. The money is available to be spent on anything you like. The sensible thing to do is to allocate your spending to things that have become relatively cheaper. That is the way people typically respond to relative price changes over time, so we see that, even though incomes are rising,

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117 Ms Heather Ridout, Australian Industry Group, *Proof Committee* Hansard, 22 April p. 22.

118 Mr Tony Westmore, ACOSS, *Proof Committee Hansard*, 21 April 2009 p. 129.

119 Professor Warrick McKibbin, *Proof Committee Hansard*, 16 April 2009 p. 35.

120 Professor John Quiggin, *Proof Committee Hansard*, 28 April 2009 p. 21.

> consumption of things that have got a great deal more expensive tends to fall…
>
> One of the features of demand for energy in general is that it is highly inelastic in the short term but elastic in the long term. If you simply raise the price, people sensibly are not going to turn their fridges off, but next time they buy a fridge they will be looking for a four-star fridge rather than a two-star fridge.[121]

4.171 Mr Tony Westmore, of the Australian Council of Social Services (ACOSS) pointed out the relative inability of low income households to respond to price signals saying:

> They are generally less well equipped to cope, to adapt, to relocate. Low income households are also likely to bear the brunt of our responses to climate change, particularly those that increase the costs of essential goods and services… The need to 'reduce carbon pollution at the lowest economic cost' is complex… The issue begs other questions—the lowest economic cost for whom and when, and for which economy?[122]

4.172 Mr Westmore did, however express ACOSS's broad support for the assistance measures provided for by the Government saying:

> Our principal constituency is low-income households, and we are reasonably satisfied at this stage that the government has done what it can.[123]

Petrol Prices

4.173 The impact of the CPRS on petrol prices will be offset by cuts in other fuel taxes over three years.[124] This transitional assistance has been criticised by many economists who believe that imposing a carbon price on motorists and then immediately offsetting it with an excise reduction is ineffective in changing behaviour.

4.174 Caltex Australia argued:

> …the excise reduction provided for motorists and certain other fuel users under the CPRS will make the inclusion of these users environmentally ineffective for many years yet it will create massive churn in emission permits. As a consequence of that ineffectiveness, due to the excise reduction, we suggest that private motorists and some commercial users be excluded from the CPRS…[125]

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121 Prof John Quiggin, *Proof Committee Hansard*, 28 April 2009 pp 21-22.

122 Mr Tony Westmore, ACOSS, *Proof Committee Hansard*, 21 April 2009 p. 128.

123 Mr Tony Westmore, ACOSS, *Proof Committee Hansard*, 21 April 2009 p. 130.

124 *White Paper*, Executive Summary, p. 4.

125 Mr Frank Topham, Caltex Australia, Proof Committee Hansard, 21 April 2009, p. 78.

4.175 By 2025, petrol suppliers will have purchased $17 billion in permits and charged them back to customers and the cumulative emissions from petrol will be the same, or slightly higher, as without the CPRS. However, there may be some advantages in fuel suppliers participating in the scheme, including establishing the administrative mechanisms required to determine and allocate liabilities for liquid fuels. Further, coverage ensures that transport emissions are included within the scheme cap. If transport emissions grow, more abatement will be required in other sectors of the economy.

4.176 Mr Blair Comley from the Department of Climate Change gave evidence of the impact of the CPRS on fuel prices and the scheme's impact on the cost of carbon over time:

> On the question of fuel, the reduction in the price incentive for fuel in the first three years will reduce the signal for emission reduction in that area and, other things being equal, will lead to a higher overall cost associated with meeting a particular target. The extent of that overall cost depends on how much you think people would have changed their behaviour as a response to that price signal, because you have effectively shifted that to the rest of the economy as a result.
>
> Most of the studies of transport demand show that at least in the short term they are relatively unresponsive to changes in price. The responsiveness or the so-called price elasticity over the longer term tends to be higher and therefore it is important that the longer term price signal is such that people can make that choice. So when people are coming to replace a car or decide where they live or make larger investments at the government scale on public transport they take account of that forward-looking carbon price. So in the short run the relative efficiency costs of muting that transport signal are relatively low because of that unresponsiveness, but it is important to have that long-term price signal when people have more opportunities to change the way in which they go about things.[126]

Implications for jobs

4.177 A major concern about the CPRS is that it will lead to large job losses. (There is a discussion about modelling of aggregate and regional employment consequences in Chapter 2. This section concentrates on evidence provided by individual firms.)

4.178 Mr Bradley Teys, Chief Executive, Teys Bros, provided evidence to the committee of possible impacts on his company, which operates in the meat processing sector:

126 Mr Blair Comley, Department of Climate Change, *Proof Committee Hansard*, 1 May 2009 p. 90.

> We would probably have to halve the plant from its current level of production…We have got currently close on a thousand people working there, so I guess you could take 400 of those out in that area.[127]

4.179 Mr Joe Marushack, President, ConocoPhillips, provided evidence to the committee on potential impacts on jobs in the LNG sector:

> Mr Joe Marushack, President, ConocoPhillips The negative effect of the proposed scheme on the international competitiveness of the Australian LNG industry has the potential on the one hand to cost Australian jobs…[128]

4.180 Mr Steve Hodgson, President and Chief Executive Officer, Bauxite and Alumina, Rio Tinto Alcan, provided the following evidence to the committee in relation to the alumina sector and other emissions intensive trade exposed industries:

> The CPRS as it stands disproportionately impacts emissions-intensive trade-exposed industries, unnecessarily affecting Australian jobs. By our analysis, the scheme before 2020 risks the following: closure of coalmines; halting expansion of value-adding alumina refining; putting aluminium smelters into survival mode; and stopping the demonstration of emerging industrial scale low emissions technologies. Most of these impacts will be felt in regional Australia.[129]

4.181 Mr Geoff Plummer, Chief Executive Officer, OneSteel, gave the following evidence to the committee:

> I would be certain there would be job losses. In the short term, unfortunately, I think it would be in the hundreds of jobs because we would lose our competitive position. In the longer term, if we lose our ability and our capacity to reinvest to ensure those jobs, it would be more than that.[130]

4.182 Mr Ralph Hillman, Executive Director of the Australian Coal Association, gave the following evidence to the committee in relation to the black coal industry:

> We are forecasting mine closures, shortened mine lives and job losses.[131]

4.183 In his evidence to the committee, Mr Chris Leon, Chair, Cement Industry Federation, noted the possible regional impacts of any job losses:

> The prognosis and why it really concerns me is that the cement industry is characterised by a lot of plants that really are the mainstay of a number of regional centres. In places such as Kandos or Railton, the town is in fact the

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127 Mr Bradley Teys, Teys Bros., *Proof Committee Hansard*, 28 April 2009, p. 5.

128 Mr Joe Marushack, President, ConocoPhillips, *Proof Committee Hansard*, 28 April 2009, p. 100.

129 Mr Steve Hodgson, President and Chief Executive Officer, Bauxite and Alumina, Rio Tinto Alcan, *Proof Committee Hansard*, 28 April 2009, p. 126.

130 Mr Geoff Plummer, Chief executive Officer, OneSteel, *Proof Committee Hansard*, 22 April 2009, p. 14.

131 Mr Ralph Hillman, Australian Coal Association, *Proof Committee Hansard*, 30 April 2009, p. 180.

> plant. I really worry as, frankly, the huge social impact on those towns will be devastating. That is why I think it is very, very unfortunate when you get to the point of those plants shutting down. Certainly the social cost will be huge.[132]

Green jobs

4.184 Some witnesses gave evidence of the potential for growth in green jobs. There was evidence given however that many of these jobs would come from a greening of traditional industries, rather than jobs growth in new green industries:

> …there are very significant opportunities for enterprise and employment, provided a signal is sent to assure people who might be prepared to make those investments and take people on—that there is a future for them. I do think there is going to be a transition, and I do think there is going to be some time where communities go through some changes, but there have to be huge chances for employment.[133]

> In the main we do not see there is a dramatic shift from blue collar skills to 'green collar' skills. A tradesperson doing maintenance on a wind turbine for a wind generation farm would have the same skill sets to do a gear box on a coal crusher.[134]

> The model actually has rapid growth in green jobs...[135]

4.185 Other industry representatives gave evidence that the net impact on employment was difficult to estimate:

> They recognise that there could be positives to employment from the CPRS. We need to make that clear. It opens up new business opportunities and avenues. In that regard it should be seen as a positive as it could be a driver of growth. At the same time we do not know its negative consequences, how those two will play out and the balance that will come from it. It is difficult to tell.[136]

Regional impacts and retraining

4.186 There will be regional implications of the CPRS.

4.187 Employment will be weaker than otherwise in regions where there is an over-representation of emissions-intensive industry. Frontier Economics gave

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132 Mr Chris Leon, Chair, Cement Industry Federation, *Proof Committee Hansard*, 30 April 2009, p. 52.

133 Mr Tony Westmore, Australian Council of Social Service, *Senate Standing Committee on Economics Proof Committee Hansard*, 23 March 2009, p. 24.

134 Mr Dave Oliver, Australian Manufacturing Workers Union, *Proof Committee Hansard*, 22 April 2009, p. 7.

135 Mr Danny Price, Frontier Economics, *Proof Fuel and Energy Select Committee Hansard*, 2 April 2009, p. 18.

136 Mr Andrew Canion, Chamber of Commerce and Industry of Western Australia, *Proof Committee Hansard*, 20 April 2009, p. 2.

evidence to the Select Committee on Fuel and Energy that the Hunter, Illawarra, central Queensland and La Trobe regions have been suggested as areas that may be particularly affected.[137]

4.188 Nonetheless, there is a case for some assistance programmes to assist some workers to move from brown jobs to green jobs. In some cases this may involve retraining. In other cases it may involve helping them move from regions dominated by high-emissions industries to regions with low- or no-emissions industry.

International linkages

4.189 A number of witnesses and submitters gave evidence of the importance of developing a domestic climate change response which facilitates international linkage and supports a healthy global permit trading market.

4.190 As noted in Chapter 3, this is often regarded as an advantage of an ETS over some alternative approaches.

4.191 Most evidence centred around the impact of trading in international permits on the domestic permit price, the extent to which Australia would need to purchase international permits to meet its international obligations and the importance of having a domestic scheme to demonstrate Australia's commitment to international action.

Impact on Domestic Permit Price

4.192 Dr Frank Jotzo, Deputy Director of the ANU Climate Change Institute, has analysed the impact of international trade in permits on domestic prices. He is critical of restricting or excluding the export of permits, saying that:

> Precluding permit exports is in many ways akin to banning any other exports from Australia – if goods that would have been exported are not allowed to be exported, this reduces demand for them and thereby reduces their domestic price. But governments, with good reason, rarely ever ban exports because exporting goods bring many economic benefits, even if domestic prices of export commodities are higher than they would be under autarky.
>
> Integration in international carbon markets is a logical step to take in line with Australia's open trading and investment regime. Openness to international market is a proven recipe for economic success, and has helped bring Australia economic prosperity in the past. The same principles apply to climate policy. Australia should look to establish full linkages with emissions trading schemes in other countries, to the extent that the schemes

137 Mr Daniel Price, Frontier Economics, *Proof Select Committee on Fuel and Energy Hansard*, 2 April 2009, p. 19.

> are compatible in their rules and have mutually acceptable levels of ambition.[138]

4.193 Dr Jotzo also pointed out that the restriction contained in the CPRS on the use of Australian permits in overseas schemes, which effectively prevents the sale of Australian Assigned Amount Units to other countries:

> …means that there could be a lower permit price in the Australian market than in international carbon markets. While this would 'protect' domestic emitters from higher carbon prices, it would mean that abatement action in Australia would remain inefficiently low. Some relatively low-cost opportunities to reduce emissions, and to sell the freed-up permits in overseas markets, would be foregone.[139]

4.194 Professor Warwick McKibbin gave evidence against trade in permits proposed in the CPRS, saying:

> How do they try to minimise costs in the CPRS? There are two ways. One is that you allow permits to come in from overseas so that if you can buy a permit, either a clean development mechanism permit under the Kyoto Protocol or you bring in a permit from another market, you can buy that instead of cutting your emissions. That is one way of minimising the costs. If it does become too expensive in Australia to hit our target we can go offshore. I do not like that strategy because once you bring those assets into the Australian market you have undermined the credibility potentially of the Australian market. It would be as if we brought in foreign currency into the Australian financial system, because we are not in control of the compliance and enforcement mechanisms. I do not like that cost smoothing strategy that is in the CPRS.[140]
>
> On a global carbon trading system you do not know, for example, who has actually done the abatement and where to validate these permits. You will get at the border a permit that says this is a unit of carbon coming from somewhere and we can trade that in the Australian market. I do not think that there is enough control.[141]

4.195 In terms of the evidence given to the Committee, the majority of witnesses and submitters were supportive of retaining enough flexibility to engage in international trade in permits in the future, albeit with differing views on how to minimise the potential risks to domestic permit prices.

Meeting international obligations

4.196 The Government has stated that the CPRS would give effect to Australia's obligations under the United Nations Framework Convention on Climate Change and

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138 Professor Frank Jotzo, *Submission 414*, p. 5.

139 Professor Frank Jotzo, *Submission 414*, p. 5.

140 Professor Warwick McKibbin, *Proof Committee Hansard*, 16 April 2009, p. 32.

141 Professor Warwick McKibbin, *Proof Committee Hansard*, 16 April 2009, p. 38.

the Kyoto Protocol.[142] On 4 May 2009, the Prime Minister, the Hon. Kevin Rudd MP, announced that Australia will commit to:

> …reducing Australia's carbon pollution by 25 per cent below 2000 levels by 2020 if the world agrees to an ambitious global deal to stabilise levels of CO2 equivalent at 450 parts per million or lower...

4.197 The Prime Minister also noted that:

> Up to 5 percentage points of this target could be met by purchasing international credits, such as avoided deforestation credits, using CPRS revenue no earlier than 2015.[143]

4.198 Dr Betz and Professor Jotzo gave evidence that:

> The presumption that Australia would not meet its reduction targets through domestic mitigation alone is supported by the Australian Treasury's modelling, where all main scenarios have Australia as a net buyer in overseas markets in 2020, assuming permit prices only somewhat below the proposed price cap. This would seem plausible given that from past trends in Australia's national emissions, a significant amount of effort would be needed to achieve even the least ambitious of the national target commitments.[144]

4.199 Dr Denniss gave evidence that:

> Given that there is no limit on the capacity of domestic polluters to import permits to meet their own targets in the CPRS but there is a prohibition on the export of credits to other countries, there is obviously the potential for a direct benefit to domestic polluters but a potentially significant impact on Australia's current account deficit and, in turn, on our exchange rate. As such the potential for a large demand for imported credit should not go unconsidered.
>
> …
>
> It is also important to highlight the risk to the Commonwealth budget. There are a number of risks. Again, one that does not appear to have been very much considered is if we agree to five to 15 per cent targets for the CPRS and then we sign up to an international agreement that asks us to go beyond that—say 20 or 25 per cent. Once we have committed to a CPRS target of 15 per cent, if there are any more stringent international obligations the difference will have to be bought. It will have to be imported, again with permits and completely from consolidated revenue. Taxes on nonpolluters will be required to purchase any permits required to

142 *CPRS Bill Commentary*, p. 14.

143 The Hon. Kevin Rudd, *Media Release*, New measures for the Carbon Pollution Reduction Scheme, 4 May 2009.

144 Professor Frank Jotzo, *Submission 414: Attachment B*, p. 12.

> make up the difference between the very low targets in the CPRS and the potentially higher targets that come out of the Copenhagen agreement.[145]

4.200 The Australian Conservation Foundation gave evidence that :

> …both a qualitative cap and a quantitative cap. With respect to the quantitative cap, we see that the action within Australia in terms of the abatement effort should be largely driven within Australia. For example, let us take the 15 per cent target. What we are doing there is reducing emissions by 15 per cent on 2000 levels, using the government's base line. We believe that the majority of that 15 per cent abatement should come from action within our own country. In effect, when you do those sums, you would not see more than 10 per cent of international permits being brought in if we had a 15 per cent cap.[146]

4.201 Mr Andrew Canion, from the Australian Chamber of Commerce and Industry, gave evidence that:

> The real problem is that there are not a lot of other international schemes out there at the moment, so the possibility for linkages is largely theoretical at this stage.[147]

145 Dr Richard Denniss, *Proof Committee Hansard*, 25 March 2009, pp 75–76.

146 Mr Owen Pascoe, ACF, *Proof Committee Hansard*, 22 April 2009, p. 63.

147 Mr Andrew Canion, *Proof Committee Hansard*, 20 April 2009, p. 14.

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

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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*.

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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 20009, 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

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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 CO_2e per annum, on average, by 2030 – compared with just 8Mt of CO_2e 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 efficiently 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]

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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 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

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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 CO_2 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]

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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]

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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]

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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 will 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]

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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 (CO_2) 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.

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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 (CH_4) is defined under the National Greenhouse and Energy Reporting Regulations 2008 (Reg2.02) as having a global warming potential (BWP) of 21, or 21 times greater than that of CO_2. 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.

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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

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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:

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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:

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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 impost 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

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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]

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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]

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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]

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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

85 *Proof Committee Hansard,* 30 April 2009, p. 15.

> 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

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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]

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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 CO_2e. 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.

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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:

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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 martial 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

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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 CO_2e 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

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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 CO_2 from coal or gas that is consumed—burnt or gasified—in order to produce electricity. The captured CO_2 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 CO_2 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 CO_2 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 CO_2, 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

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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 CO_2 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 CO_2 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]

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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.

Chapter 6

Agriculture and land use

6.1 This chapter examines issues related to agriculture and land use. After a short discussion of the key concept of biosequestration, the chapter comprises sections on agriculture, reforestation, deforestation, soil carbon and carbon accounting.

6.2 The committee heard from a range of stakeholders that commented on agriculture and land use issues. A number of roundtables were held throughout the hearings, which provided much useful evidence on these issues. These included roundtables on the science of climate change, green carbon and carbon accounting.

Biosequestration

6.3 Biosequestration occurs where atmospheric CO_2 is 'locked up' in soil or plant stocks, generally through natural processes such as plant growth. Biosequestration of CO_2 may occur due to the activity of natural ecosystems as well as from agricultural activities, such as the growing of trees or crops. Equally, CO_2 is released from these sources when they are destroyed or degraded, such as through burning, decomposition or consumption.

6.4 Dr Heather Keith, an academic specialist on forest ecology, provided the following definition of sources of biosequestration:

> We used the term [green carbon] to distinguish between fossil fuel carbon and carbon in biological systems. I would further separate the biological carbon into green carbon that represents natural ecosystems that are resilient and self-regenerating, so providing a very high carbon density and secure storage of carbon. I would distinguish that from industrialised plant production that includes agriculture and plantation forestry.[1]

6.5 Because biosequestration involves the removal of CO_2 from the atmosphere, it represents a form of greenhouse gas mitigation. At the roundtable on climate science, witnesses emphasised that methods of sequestering CO_2 were increasingly important given the fact that atmospheric concentrations of CO_2e have already exceeded 450 ppm.[2] This implies that in order to stabilise CO_2e at this level or lower,[3] the global effort now required a significant effort to not only abate or reduce future emissions but also to remove CO_2 from the atmosphere.

6.6 In considering the effectiveness of various forms of biosequestration, the extent of permanency is an important consideration, and one that will depend on a

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1 Dr Heather Keith, *Proof Committee Hansard*, 16 April 2009, p. 70.

2 *Proof Committee Hansard*, 15 April 2009, pp 77-78.

3 The issue of targets is discussed in Chapter 2.

number of factors. For example, in general terms carbon that is locked up in forests, or used for housing or furniture, is removed from the atmosphere for longer than is carbon stored in a food or paper product. However, paper products are capable of lasting up to 30 years in landfill.

6.7 The assessment of levels of biosequestration for the purposes of calculating additions or reductions to atmospheric carbon is referred to as 'carbon accounting'. The committee received much evidence on this critical issue, discussed in the final section of this chapter.

6.8 The importance of establishing comprehensive policies around biosequestration was a consistent theme across the hearings conducted by the committee:

> It is time to move on to the…key issues, which are tests of the credibility of the government…[These include the question:] How are we going to get the best carbon outcomes from biosequestration?[4]
>
> …there is potential with the agricultural sector and biochar, which are not covered under the early CPRS, to significantly abate emissions…[5]
>
> …we would also like to see an appropriate market signal that can work through into abatement activities, including sequestration, for our industry.[6]

Agriculture

Introduction

6.9 A common theme from all submitters and witnesses who discussed agriculture and land use issues was the historical adaptability of Australian farmers, and many called for policies that will harness and foster the independence and ingenuity of the agricultural sector. This confidence in the capacity of the agricultural sector to embrace and drive change is shared by all members of the committee.

6.10 A consistent view from agriculture-related organisations, as well as environmental and other stakeholders, was that under the current and proposed policy settings in Australia the agricultural sector could not access the opportunities offered by climate change abatement and mitigation activities, such as the new income streams that could be opened up by renewable energy, soil carbon and avoiding deforestation.

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4 Mr John Connor, Chief Executive Officer, Climate Institute, *Proof Committee Hansard*, 20 May 2009, p. 28.

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

6 Mr Allan Hansard, Chief Executive Officer, National Association of Forestry Industries *Proof Committee Hansard*, 20 May 2009, p. 75.

6.11 The potentially negative impact of climate change policies on agricultural sector production and incomes was also explored in some detail throughout the hearings.

Greenhouse gas emissions from agriculture

6.12 Agriculture emissions consist mainly of methane and nitrous oxide from livestock and cropping and make up 16 per cent of Australia's emissions.[7] However, at least in the early years, the agricultural sector will not be covered in the CPRS.[8]

6.13 The Grain Growers Association noted that current assessments of agricultural emissions did not take into account the sector's CO_2 sequestration potential.[9] Dr Christine Jones, who founded the Australian Soil Carbon Accreditation Scheme, explained:

> If you take the complete lifecycle analysis, there definitely are farmers who are sequestering more carbon than they are emitting.[10]

6.14 This issue is discussed further below.

Impact of climate change on agriculture

6.15 The National Farmers Federation (NFF) viewed climate change policy as being able to provide the agricultural sector with tools to manage on-farm risk related to 'climate variability':[11]

> …[Farmers] are at the interface of climate every day. So whether it is climate variability, climatic risk, a shift in climate, climate change or a change in climate, we are dealing with it. The variability exists and there are models that say that the variability will increase. So how are we going to deal with it on farm? The global predictions of X degree change are no doubt important and interesting, but the issue for us is what is happening on my farm and in my region and how I am going to adapt to that so that I can do more with less.[12]

6.16 The Tasmanian Farmers and Graziers Association observed:

> Obviously, with the current drought, we are seeing what could be climate change…So, when we say that climate change is real, our members,

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7 *White Paper*, p. 6-43.

8 The question of the inclusion of agriculture is discussed below, from paragraph 6.[40].

9 Mr Bryan Clark, Grain Growers Association, *Proof Committee Hansard*, 16 April 2009, p. 88.

10 Dr Christine Jones, *Proof Committee Hansard*, 16 April 2009, pp 88-89.

11 Mr Ben Fargher, Chief Executive Officer, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 5.

12 Mr Ben Fargher, Chief Executive Officer National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 4.

> especially in those areas, are fully aware of that because they are seeing every day that something is going on. A lot of the traditional ways of farming and the records they have kept, which they have relied on, will just not be of any use to them in the future…[13]

6.17 The Australian Bureau of Agricultural and Resource Economics (ABARE) drew the committee's attention to modelling it completed in 2007 which showed significant declines in Australian agricultural production if no action was taken on climate change:

> …[the] modelling…showed that by about 2030 you are looking at roughly 10 per cent declines in sugar, dairy, beef, sheep meat and wheat. By 2050 beef is down by a bit under 20 per cent; dairy, 18 per cent; sugar, 15 per cent and so on.[14]

6.18 Early work that ABARE was undertaking to assess the vulnerability of various regions was indicating:

> …the more robust a regional community is, the more diverse it is, the greater the range of agricultural pursuits in the agricultural economy and the greater the range of industries in that particular region, the less vulnerable they are to climate change.[15]

Impact of CPRS on agriculture

6.19 The committee heard from a variety of sources about the estimated impact of the CPRS on agriculture.

Modelling of impacts

6.20 As noted in Chapter 2, the Treasury have modelled impacts at a state level, and by industry, but did not believe the available data would support comprehensive modelling of the impacts of the CPRS on regional areas.

6.21 The Australian Farm Institute (AFI) referred to three studies, by ABARE, by the Centre for International Economics (which they had commissioned) and their own work, and noted:

> In summary, all three analyses projected CPRS related input cost increases in the range of one to three per cent by 2015, which would result in decreases in farm profit margins of between three and six per cent, all other things being equal. These results took into account government fuel excise and rebate commitments. Each of the three modelling exercises also

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13 Mr Nick Flittner, Tasmanian Farmers and Graziers Association, *Proof Committee Hansard*, 23 April 2009, p. 23.

14 Mr Phillip Glyde, Executive Director, ABARE *Proof Committee Hansard*, 16 April 2009, p. 125.

15 Mr Phillip Glyde, Executive Director, ABARE, *Proof Committee Hansard*, 16 April 2009, p. 126.

> investigated the post-2015 direct CPRS impacts on agriculture, assuming agricultural emissions attract equivalent costs to other emissions.[16]

6.22 The committee notes that from the outset there was a lack of clarity around how modelling should treat the inclusion of agriculture in terms of EITE assistance. That is, if agriculture were classed as receiving the highest rate of EITE assistance, would it receive a 90 per cent allocation of free permits (equivalent to the nominal starting year allocation for other industries), or a 95 per cent allocation of free permits (equivalent to the starting year allocation for other industries under the revised CPRS scheme announced on 4 May 2009)? It now appears that the annual 1.3 per cent carbon productivity contribution for the years prior to agriculture's inclusion would be subtracted from the amount of free permits allocated to agriculture in its first year of inclusion in 2015.

6.23 The AFI modelling predicted an approximate 20 per cent reduction in farm profitability by 2030 for both grains and livestock, assuming that livestock production attracted 90 per cent free emissions permits under its EITE status.

6.24 Modelling by the Centre for International Economics projected that, relative to business as usual, agriculture sector outputs would reduce by up to 28 per cent for beef and wool production by 2030; with grain outputs reduced by 'somewhere in the region of two to five per cent'.[17] Mr David Pearce outlined the findings:

> Agriculture will be affected by the CPRS on commencement…through the indirect effect of the CPRS on prices within the economy. Some agricultural inputs (fertilizers, other chemicals, transport, machinery and so on) are energy intensive or contain energy intensive materials. To the extent that the CPRS raises energy costs, then the costs of agriculture will increase…[Our] analysis…suggests that even if it is not covered agriculture will experience costs…
>
> The costs experienced by agriculture, will of course, be experienced by many other sectors of the economy, so agriculture is not unique in this regard.[18]

6.25 The NFF concurred with this analysis. In addition, farmers' representatives noted that agriculture was an internationally exposed sector with an incapacity to pass on the increased costs; and that supply chain members, such as food processors, would be covered by the CPRS, which could see increased costs passed back to farmers in the form of lower prices:

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16 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 104.

17 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, pp 104-5.

18 Mr David Pearce, Centre for International Economics, *Answer to question on notice*, 16 April 2009.

> We also expect there to be increased costs to the processing sector, as that is being considered an industrial processor, which includes abattoirs and things like that. They will have increased costs because they also will be covered. We believe that, because the agricultural sector is a price taker and we cannot pass costs on very effectively, processing plants will offer lower prices to our farmers for their produce to offset the additional costs of those processing plants…On top of those two things…agriculture is a price taker in the world markets, and we do not really have a great opportunity to pass those costs on elsewhere.[19]

6.26 ABARE's modelling produced findings similar to the CIE's work on the initial impact of the CPRS on input costs (that is, not including potential pass-back or post farm-gate costs).[20] Based on the five per cent reduction target and a carbon price of $40 a tonne, it found that the impact on input costs of the agricultural sector would vary between 0.1 per cent and just under 0.5 per cent.[21] It was observed:

> …the projections for the indirect cost impact—in other words, the energy related cost impact that flows through in terms of the cost of farm inputs—by 2015 is actually quite similar between ABARE and other modellers. The projected increase in farm input costs is in the region of one to three per cent, which results in a decrease in farm profitability somewhere between three and six per cent. That sort of projection is quite consistent.[22]

6.27 However, ABARE concluded there would be less of an impact on agriculture due to the CPRS after 2015 (that is, once it is included in the CPRS). Recently completed work showed that the impact on meat processors by 2030 was a decline of 5.8 per cent; for other processed foods it was 0.6 per cent; and for processed milk it was minus 2.8 per cent.[23]

6.28 In terms of output, ABARE found that production in the beef and sheep sectors by 2030 would be eight per cent lower than if the CPRS had not been instituted; there would still be growth in output of 24 per cent. For grain, ABARE predicted a 5.3 per cent increase in production. Taking into account all production

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19 Mr Nick Flittner, Tasmanian Farmers and Graziers Association, *Proof Committee Hansard*, 23 April 2009, p. 20. See also Mr Charles McElhone, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 9.

20 Note that the work did not take into account the impacts and associated costs of climate change: Mr Philip Glyde, Executive Director, ABARE, *Proof Committee Hansard*, 16 April 2009, p. 113.

21 Mr Philip Glyde, Executive Director, ABARE, *Proof Committee Hansard*, 16 April 2009, p. 113.

22 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 106.

23 ABARE, *Proof Committee Hansard*, 16 April 2009, p. 123.

costs, the modelling showed a 20 per cent increase in cost for beef cattle and sheep meat by 2030.[24]

6.29 ABARE advised at a hearing that the conclusion to be drawn from their modelling was that 'with the current settings and the current assumptions in the model, the agriculture industry is minimally impacted by the CPRS out to 2030'.[25] (A new study by ABARE, after the hearings had concluded, comments:

> Like all sectors of the economy, agriculture will face higher input costs because of the CPRS from 2011…There may also be a CPRS related cost-price pass-through from downstream processors to farmers that lowers the prices farmers receive for their produce.)[26]

6.30 Regarding the different conclusions reached in relation to the impacts of the CPRS post-2015 and out to 2030, ABARE and the AFI explained that this was due to differences in starting point assumptions, given that both were using a similar model.[27]

6.31 Commenting on ABARE's modelling, AFI identified three assumptions that differed from their own. The most critical of these was ABARE's assumption of equivalent emissions policy impacts on agricultural sectors for developed nations from 2010; and equivalent policy impacts on agricultural sectors for developing nations from 2015:

> The differences between the ABARE results on the one hand and the other two sets of modelling highlight the potentially large economic impact that the CPRS could have on Australian agriculture in the event that competitors in international markets do not adopt equivalent emissions policies for their agricultural sectors—a situation that appears highly likely.[28]

6.32 AFI also noted that ABARE incorporated the lower emissions reduction scenario of five per cent rather than the greater reductions that would occur in the event of an international agreement. It was also relevant that ABARE had assumed there would be 3.3 million hectares of forestry development by 2030, which would contribute to emissions reduction.

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24 ABARE, *Proof Committee Hansard*, 16 April 2009, p. 120.

25 Mr Philip Glyde, Executive Director, ABARE, *Proof Committee Hansard*, 16 April 2009, p. 115.

26 The study gives a range of estimates of the impact on the economic value of farm production, depending on whether agriculture is included in the CPRS and what assumption is made regarding the extent of pass-through from processors to farmers; Tulloh et al, 'Effects of the Carbon Pollution Reduction Scheme on the economic value of farm production', *ABARE Issues Insights*, June 2009.

27 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 105.

28 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 105.

6.33 Commenting on the AFI's modelling, ABARE made three points. First, the AFI assumed that the response from agriculture was limited to reduction in output and that there is 'not much happening' on the technology front. Second, the AFI work did not strongly reflect the policy settings as proposed in relation to the CPRS. Third, the AFI work assumed that only Australia and New Zealand had imposed a carbon price, whereas the ABARE modelling assumed greater (phased) country coverage.[29]

6.34 Commenting on the effect of the 'real impacts of climate change' and higher input costs for farmers, the Australian Food and Grocery Council saw this as a threat to the competitiveness and profitability of Australia's food and grocery industry.[30] The Council estimated that the effect of the CPRS on increasing the costs of food production would 'undoubtedly result in higher food, beverage and grocery prices'.[31] The Council called for specific modelling of the effect of the CPRS on food prices, noting that the *White Paper* was deficient in this respect; and that households spent more on food and beverages than on energy.[32]

6.35 The committee heard some evidence on particular cost increases. The NFF advised that the additional cost of the CPRS on abattoir processing could be around $5 per cow and 80c per sheep.[33] Teys Bros estimated that the cost of permits would be around $6.30 per head of cattle, with input costs increased by about $10 a head.[34] On a worst case scenario, in which 'there is no trade-exposed status given to the livestock production and beef processing sector' it was estimated that:

> … production will be down by 14 per cent in 2030, exports down 14 per cent by 2030 and gross operating profit across the sector down 62 per cent.[35]

6.36 Teys were also concerned about the potential for carbon leakage:

> The scheme, I believe, will create carbon leakage as Australia is an emissions-efficient producer of beef. Pressures on its competitiveness will reduce our exports, which will be picked up by countries that are less efficient producers from an emissions perspective. For example, per 10

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29 Dr Helal Ahammad, Department of Agriculture, Fisheries and Forestry, *Proof Committee Hansard*, 16 April 2009, p. 117.

30 *Submission 330*, p. 4.

31 *Submission 330*, p. 9.

32 *Submission 330*, p. 9.

33 *Proof Committee Hansard*, 15 April 2009, p. 11, citing the Australian Meat Industry Council; see also Mr Mick Keogh, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 107.

34 Mr Brad Teys, Chief Executive Officer, Teys Bros Pty Limited, *Proof Committee Hansard*, 28 April 2009, p. 3.

35 Mr Brad Teys, Chief Executive Officer, Teys Bros, *Proof Committee Hansard*, 20 May 2009, p. 84.

> million head in a herd, Australia produces 71 per cent more beef than Brazil.[36]

6.37 The dairy industry, it was suggested, were estimating reduced farm incomes of about 15 per cent.[37] Bega Cheese offered some detail on potential impacts:

> We are pleased with the continued exclusion of the agricultural sector but believe that it still does not shield our dairy farmers from the impact of the flow-through effect of the CPRS. There will be approximately $6,000 to $9,000 worth of cost that will flow through the manufacturing part of the business. One of two things will happen: the cost will either flow back through to our farmers and they will have a reduced per animal cost for their milk or it will reduce our competitiveness in the international scene. We either take it out of the farmer's payment or the cost of our products that we are exporting will be more. Presently, Bega exports to about 50 different countries. We compete globally with all the other dairy manufacturers around the world. Our prices will, more than likely, step up.[38]

6.38 The committee also heard of concerns over market distortions and competitive disadvantage arising from the operation of the CPRS threshold for regulating entities:

> So, because we are selling in most places a commodity, there is very little competitive advantage except in the efficiency of the processing sector. So when, say, eight or 10 of the largest meat establishments are caught in an ETS scheme because they exceed the 25 kiloton threshold, they automatically have a disadvantage with that cost compared with their smaller competitors who are not paying that permit cost. Also, in the last 25 years there has been a huge effort to consolidate the industry and to have bigger plants slaughtering more cattle, mainly to have more efficiency—it is an efficiency driven thing. This is a kind of taxing efficiency, because it is those bigger players that are indeed caught in the threshold.[39]

6.39 Dairy Australia believed that the industry would experience a significant increase in costs, leading to concerns about its competitiveness and carbon leakage:

> From a dairy perspective, we can see some costs coming of up to $40 million to $60 million a year under the CPRS scheme, which would translate back to farms because of the trade exposure of our industry. Even though the farm sector is not covered in 2010 there will be significant costs to Australian dairy farmers from the beginning of the scheme, depending on the price of carbon, of somewhere between $6,000 and $9,000 a farm… Unfortunately, because of the situation where the majority of emissions

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36 *Proof Committee Hansard*, 20 May 2009, p. 85.

37 *Proof Committee Hansard*, 15 April 2009, p. 12.

38 Mr Elvis Amair, Technical Services Manager, Bega Cheese Ltd, *Proof Committee Hansard*, 20 May 2009, p. 89.

39 Mr Brad Teys, Teys Bros, *Proof Committee Hansard*, 28 April 2009, p. 2.

> occur at farm level but the majority of value adding occurs at the manufacturing level, we have a situation where our processing sector of the industry, the processing part of the dairy and beef value chains, is not regarded as emissions intensive trade exposed. Therefore, our processing firms are liable to full coverage from the scheme from 2010 and basically a 100 per cent cost increase under the scheme. There will be no provision for free permits.[40]

Inclusion in the CPRS

6.40 The committee notes that the question of including agriculture in the CPRS will not be settled until 2013, when it will be considered for inclusion in the scheme from 2015. The *White Paper* provides the following reasons for the exclusion of agriculture:

> Estimating agriculture emissions is complex. These emissions are highly variable in response to management practices and climatic conditions…
>
> The sector also includes more than 100 000 entities, many of which emit only small amounts of greenhouse gases each year. Only a small number of farm businesses emit more than 25 000 tonnes of CO_2e a year, which is the general Scheme threshold. If Scheme obligations were applied to farm businesses above this threshold only, most agriculture emissions would not be covered by the Scheme. Significant competitive distortions would then arise between closely competing farm businesses on either side of the Scheme threshold. On the other hand, a lower participation threshold would impose compliance costs on farm businesses that would be disproportionately higher than for other businesses within the Scheme.[41]

6.41 The CO2 Group discussed the difficulties of regulating such a large number of entities:

> There are transaction costs as well. This is the great conundrum about agriculture. There is no doubt that agriculture, as a sector, is a substantial emitter, but the practical reality of being able to regulate thousands and thousands of small farmers and bring them effectively into a scheme…is the reason it has not been included. All scheme design around the world is focussed on the logic of going upstream, concentrating on large emitters because they are practical units of regulation.[42]

6.42 The NFF agreed with the decision that agriculture be presently excluded from the CPRS, pointing to some additional problems in this respect:

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40 Mr Chris Phillips, General Manager, Trade and Strategy, Dairy Australia, *Proof Committee Hansard*, 30 April 2009, pp 199-201.

41 *White Paper*, p. 6-44. The committee notes that even if agriculture is included in the scheme from 2015 soil carbon (which is not included under the Kyoto Protocol) will not be part of agricultural emissions: see Dr Judith Ajani, *Submission 340*, p. 1.

42 Mr Andrew Grant, Chief Executive Officer, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 91.

> …an ETS is not currently appropriate for agriculture due to a range of reasons. [These]…include the measuring, monitoring and verification issues, as well as the complex issues of post-Kyoto rules, how land use is taken into account in terms of those rules and how natural emissions and man-made emissions get lumped together. They just, quite frankly, do not work for us.[43]

6.43 A number of witnesses felt that agriculture should not ultimately be included in the CPRS in 2015. The NFF observed that it 'may never be appropriate' to include agriculture in the CPRS.[44]

6.44 The CO2 group felt that complementary measures were better suited than the CPRS to addressing agricultural emissions.[45] Dr Judith Ajani concurred:

> I do not think that we should be looking at putting the agricultural sector into the ETS just to capture some pricing benefits that are highly uncertain at this stage, but rather we should be looking at a whole-of-agricultural policy…There is more to the agricultural issues than just carbon. There are water issues, biodiversity issues and across-the-board sustainability issues in transport. I would encourage looking at agriculture as a whole issue, not just a single issue.[46]

6.45 The Grain Growers Association advised that it did not consider agriculture suitable to be included under the CPRS. It was concerned at the delay in formulating a national policy approach towards agriculture.[47] The Association called for the establishment of a voluntary scheme for agriculture based on the Kyoto Protocol Clean Development Mechanism (CDM), which is in essence a baseline and credit scheme where tradeable credits can be earned from abatement and mitigation activities. This could provide a domestic source of carbon credits for regulated entities under the CPRS as well as income generating opportunities for the agricultural sector.[48]

6.46 The Tasmanian farmers' representative also commented on the delay in addressing agriculture, noting that it had led to a lack of incentives for farmers to

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43 Mr Ben Fargher, Chief Executive Officer, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 3.

44 Mr Ben Fargher, Chief Executive Officer, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 3.

45 Mr Andrew Grant, Chief Executive Officer, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 91.

46 Dr Judith Ajani, Economist, Fenner School of Environment and Society, Australian National University, *Proof Committee Hansard*, 16 April 2009, p. 81.

47 Mr Bryan Clark, Industry Development Manager, Grain Growers Association, *Proof Committee Hansard*, 16 April 2009, p. 82.

48 Mr Bryan Clark, Industry Development Manager, Grain Growers Association, *Proof Committee Hansard*, 16 April 2009, p. 92.

adopt practices that could make substantial contributions to both reducing greenhouse gas emissions and to providing productivity and income opportunities for farmers:

> …at the moment, there is little incentive for farmers to adapt to emission reduction techniques and things like soil carbon sequestration, because they are just not on the immediate agenda. Also…the current regime will exclude opportunities for offsetting from agriculture to other sectors until a decision has been made as to whether agriculture is in or out. So that really takes out another whole raft of opportunities for our farmers. In addition, the CPRS really does not provide any real incentives for best management practices or renewable energy production on farm, which we believe could have great potential for our farmers.[49]

6.47 The Australian Farm Institute also commented on the current lack of incentives for agriculture in the CPRS:

> …the way…[the CPRS] is proposed at the moment, which would just be a price on emissions with no incentives for abatement other than forestry, it is very difficult to see what progress can be made in relation to agricultural emissions.[50]

6.48 The Grains Council called for the rapid development of complementary measures outside the framework of the CPRS:

> What we are saying is that it is not a one-size-fits-all approach. We need to look outside the square of the ETS and the CPRS and see what complementary measures can we start tomorrow in the agricultural industry so we can be part of the solution.[51]

6.49 The NFF noted the ongoing process of the sector better understanding the 'potential ramifications' of bringing agriculture inside the proposed CPRS:

> It is an education process that we feel is very important for us, bearing in mind that it is only Australia and New Zealand who are entertaining the idea of covering agriculture within their emissions trading schemes.[52]

6.50 In international terms, the committee received evidence that few countries are considering the inclusion of agriculture in their emissions trading schemes. The committee notes that it appears unlikely that many, if any, countries will include the sector in their emissions trading schemes.

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49 Mr Nick Flittner, Tasmanian Farmers and Graziers Association, *Proof Committee Hansard*, 23 April 2009, p. 20.

50 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 113.

51 Ms Tara Taubenschlag, Grains Council of Australia, *Proof Committee Hansard*, 16 April 2009, p. 88.

52 Mr Charles McElhone, NFF, *Proof Committee Hansard*, 15 April 2009, p. 16.

Need to develop complementary policy measures outside the CPRS

6.51 Given agriculture's significant contribution to greenhouse gas emissions; its exclusion from the CPRS until 2015, and potentially beyond; and the lack of incentives for farmers in the CPRS as it is currently proposed, a range of stakeholders argued that separate and additional or complementary policy measures were needed to address the agricultural sector.

6.52 Witnesses and submitters consistently pointed to the fact that agriculture had very significant potential for greenhouse gas mitigation, which could also contribute to enhancing the productive capacity and income potential of agricultural land, and to addressing persistent environmental problems such as salinity and loss of biodiversity.

6.53 For example, Dr Ajani stated:

> …Australia should bring the land use sector into a wider climate policy, with food security, water and ecological sustainability prime considerations…[53]

6.54 Similarly, the Grains Council of Australia noted:

> Food security, increased productivity and climate change should be considered synergistically and not as separate parts. We look forward to an industry partnership approach…and to a new low-carbon farming future which will seek to place Australian agriculture as a world leader in the solution to the management of CO_2 concentrations at sustainable levels.[54]

6.55 The CO2 Group observed that 'anything we can do that is complementary and synergistic should be explored'.[55]

6.56 The Tasmanian Farmers and Graziers Association stated:

> We would like to see incentives and rewards being provided for both the adaptation and innovation that our farmers will need to undertake and also for emission reduction.[56]

Need for additional research on adaptation and mitigation

6.57 The committee heard numerous calls for further research on adaptation and mitigation. The NFF noted:

> I hope to talk about some of the issues around adaptation not just mitigation, because for us that ongoing adaptation is important and we do

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53 *Submission 340*, p. 1.

54 Ms Tara Taubenschlag, Communications Adviser, Grains Council of Australia, *Proof Committee Hansard*, 16 April 2009, p. 70.

55 Mr Andrew Grant, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 92.

56 Mr Nick Flittner, Tasmanian Farmers and Graziers Association, *Proof Committee Hansard*, 23 April 2009, p. 20.

> need the information, the research and development and the tools to be able to give those options to farmers so they can make those management decisions on farm and continue to produce food and fibre.[57]

6.58 The Western Australian Farmers Federation's president noted that they had 'lobbied for increased research funding for agriculture's role in greenhouse gas mitigation and abatement'.[58] Commenting on the limited ability of the sector to fund research into agriculture and climate change related issues, their climate change spokesperson called for increased government expenditure to enable solutions to be identified which would allow farmers to pursue activities that promote both farm productivity and CO_2 abatement and/or mitigation.[59]

Committee comment

6.59 The committee notes that, in the context of climate change and a carbon constrained world, the agriculture and land use sector is a significant contributor to Australia's CO_2 emissions. The committee accepts the reasons for the decision to exclude agriculture from the initial phase of the proposed CPRS, but notes that there is a significant possibility that agriculture would not be found suitable for inclusion from 2015. The committee notes also that on 4 May 2009 the Government announced that it would put back the start of the CPRS for 12 months, which would allow for a refocusing of resources on examining the inclusion of agriculture.

6.60 The committee heard a range of evidence from scientists, academics, farmers and environmental groups that Australia and its agricultural sector are particularly vulnerable to the impacts of climate change. Farm groups also emphasised that Australian farmers were accustomed to dealing with climate variability and extremes. Noting the need for information and skills to assist farmers to adapt to climate change, the committee considers it imperative that the government fund research into regional impacts of climate change to assist on-farm planning and adaptation.

6.61 The committee devoted considerable time to investigating the question of the impact of the CPRS on the agriculture sector. It found that there was agreement amongst submitters and witnesses that the sector would experience increased input costs following the inception of the scheme, in particular due to the increased price of energy. The committee notes that, under current and proposed policy settings, the increase was estimated to be somewhere in the range of 0.1 per cent to three per cent, and that similar increases would affect all sectors of the economy as intended by the scheme.

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57 Mr Ben Fargher, Chief Executive Officer, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 3.

58 Mr Mike Norton, President, Western Australian Farmers Federation, *Proof Committee Hansard*, 20 April 2009, p. 95.

59 Mr Dale Park, Western Australian Farmers Federation, *Proof Committee Hansard*, 20 April 2009, p. 105

6.62 Evidence was also heard about the potential for market distortion and competitive disadvantages within industry sectors arising from the CPRS emissions threshold for regulating entities. A notable example was the concern expressed by beef processors that the emissions threshold of 25 000 tonnes of CO_2e for inclusion under the CPRS would penalise larger, more efficient operations by requiring them to purchase permits for emissions; smaller operations that came under the threshold and hence were not required to purchase permits would enjoy a competitive advantage. Any such market distortion would effectively act as a tax on efficiency and could see other perverse outcomes such as companies foregoing expansion opportunities, or restructuring or downsizing, to remain or come under the scheme threshold. Clearly, international trade competitiveness could also be damaged in such circumstances.

6.63 A second notable example was the effect of the proposed CPRS on the dairy sector. The committee heard that dairy farming was an emissions intensive trade exposed sector that, being classed as agriculture, would not be included under the CPRS. However, the processing side of the sector was not considered to be emissions intensive or trade exposed and would therefore pay 100 per cent of the price of its emissions under the CPRS. The significant cost increases to the processing side of the industry could clearly affect the sector's international trade competitiveness.

Recommendation 7

6.64 The committee recommends the Government review the impact of the CPRS to avoid the EITE provisions generating perverse outcomes for the agriculture sector and the food processing and manufacturing sector such as scaling down and splitting operations.

6.65 However, there was some disagreement in the evidence about the effect of the CPRS on agriculture out to 2030 in the event that agriculture is included in the scheme. Some members of the committee were also concerned about the compounding effect of the RET scheme on agricultural productivity and profitability. The committee notes that limited modelling of these issues has been undertaken; and that modelling outcomes are highly dependent on starting assumptions, which can legitimately differ based on assessments of relevant policy and external factors. Given this, the committee agreed that more extensive and detailed modelling of impacts of climate policy choices on agriculture is desirable. A more comprehensive and detailed understanding of the impacts of the CPRS on agriculture is needed before a decision can be properly made on the inclusion of agriculture in the proposed CPRS.

6.66 The committee notes there was a considerable convergence of views across a range of stakeholders in relation to the suitability of agriculture for inclusion in the CPRS. Submitters and witnesses pointed to the complexity of monitoring and verification of agricultural emissions, and of regulating the large number of entities in the sector. Further, many questioned whether an emissions trading scheme could provide adequate incentives to pursue the significant opportunities for greenhouse gas abatement and mitigation that exist in the agricultural sector, particularly in light of the carbon accounting rules in their present form. In addition, the committee heard extensive claims that many strategies to reduce greenhouse gases could not only

secure significant reductions but also deliver a range of impressive environmental and productivity benefits for Australia's farmers and land managers.

6.67 Given this, there were consistent calls to begin immediately to develop and put in place complementary measures for greenhouse gas abatement and mitigation in the agricultural sector, with a particular focus on developing new income streams to create ongoing incentives for farmers to undertake greenhouse gas abatement and mitigation activities.

Recommendation 8

6.68 The committee recommends that, as a priority, the Government develop complementary policy measures for greenhouse gas abatement and mitigation in the agricultural sector; and that such policy measures be underpinned by substantially greater research and development in this area.

Recommendation 9

6.69 The committee recommends that the Government establish an agriculture and land use policy taskforce to accelerate the development of complementary climate change policy measures for the land use sector; and to promote full carbon accounting in land use, agriculture and forestry sectors in international climate change fora.

Reforestation

Potential for biosequestration

6.70 For the purposes of this section, reforestation should be understood as both commercial and environmental. Mr Peter Cosier, an environmental policy specialist, highlighted a significant difference between commercial reforestation, such as plantations, and environmental plantings. He described these approaches as distinct in terms of carbon sequestration:

> There is the forest industry, the forest product sector, and what they call environmental plantings. It is the environmental plantings with the higher carbon prices where you get your massive carbon sequestration because that carbon stays in that landscape and hence that is where most of the investment will go.[60]

6.71 Mr Cosier described the significant potential for biosequestration through reforestation to contribute to the reduction of atmospheric CO_2:

> According to a McKinsey study done last year, we believe that terrestrial carbon, that is, tree planting and increasing soil carbon, can contribute

60 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 16 April 2009, pp 68-69.

> between 25 per cent and 30 per cent of the solution to climate change mitigation.[61]

6.72 The CO2 Group called for reforestation to be pursued as a ready and practical measure for carbon sequestration:

> …[Reforestation] is robust. Most critically it is proven. It is here and now, so it is not something that we need a lot of research and development to implement. It brings a range of other benefits, and Australia leads the world in terms of the technical and scientific underpinnings of reforestation from a credibility point of view and also from a commercial aspect.[62]

6.73 The committee notes, however, that biosequestration involves many policy variables that can affect the outcome in terms of CO_2 sequestration. Mr Cosier observed that the Garnaut report had identified 12 potential biosequestration options. For example, environmental plantings could be cycled to provide a source of biofuel to offset fossil fuel emissions; however, this would lower the net carbon stored. Mr Cosier observed that there were 'quite complex resource economics involved' in this issue.[63]

6.74 It was also acknowledged that there had been no dynamic equilibrium modelling done to assess the impacts of the terrestrial carbon market on such critical areas as food and fibre production.[64] The committee considers this to be of critical importance, given the importance of food and fibre production to Australia in terms of food security and as an income stream for Australian farmers. On this issue, Mr Cosier cited work done by ABARE which illustrated both the practical opportunities and constraints of any significant effort to pursue biosequestration as a mitigation option:

> ABARE's analysis…suggested that we could open up the opportunity of about five to six million hectares of tree planting in both commercial plantations and environmental plantings. To give you some idea of scale, that is equivalent to about 20 per cent of the Murray-Darling Basin. The argument against that is that we need to use our agricultural lands to grow food and fibre, which is an obvious answer, given that the world population is growing and demand for food and fibre is growing.[65]

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61 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 78.

62 Mr Andrew Grant, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 68-69.

63 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 99.

64 *Proof Committee Hansard*, 16 April 2009, p. 74.

65 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 78.

Reforestation under the CPRS

6.75 Under the Kyoto Protocol, parties must count emissions and removals of greenhouse gases from forests established after January 1 1990 on previously cleared land. Australia's definition of 'reforestation' for Kyoto Protocol purposes is:

- a forest of trees with a potential height of at least two metres and crown cover of at least 20 per cent; and
- in patches greater than 0.2 hectares.

6.76 Under the CPRS, the government proposes that all eligible reforestation may be included on a voluntary basis. This will allow credits to be generated for the biosequestration of carbon. This is the only land use that is proposed to be covered by the CPRS.[66] In reference to the delayed starting date for the CPRS, the National Association of Forestry Industries (NAFI), commented:

> NAFI supports the changes to the CPRS announced by the government on 4 May, noting it will provide more time for the industry to adjust while at the same time allowing reforestation to voluntarily generate permits for carbon stored from July 2010.[67]

6.77 Beyond this however, NAFI identified a number of concerns with the present design of the CPRS in relation to the forestry industry:

> The narrow rule set adopted by the government has created issues with the inclusion of forestry and more work is required to get the draft scheme right so that the forest industry has the confidence to opt in on a voluntary basis. The design issues include cascading, liability issues for forest maintenance requirements, uncertainty over carbon estimation methods, trading restrictions on exports of units compared to unlimited imports of international units and an inflexibility in the carbon credit approach for forest projects.[68]

6.78 NAFI also expressed concern over:

> …the inequity and exclusion of forestry under the CPRS fuel credit scheme, which will apply to agricultural and fisheries small businesses to help offset the impact of fuel price rises. The question that we have been asking the government and not given a straight or logical answer on is: why has forestry been excluded from the scheme when agricultural and fishing activities have been included?[69]

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66 At least until the possible inclusion of agriculture in 2015: see below.

67 Mr Allan Hansard, Chief Executive Officer, National Association of Forestry Industries, *Proof Committee Hansard*, 20 May 2009, p. 63.

68 Mr Allan Hansard, Chief Executive Officer, National Association of Forestry Industries *Proof Committee Hansard*, 20 May 2009, p. 63.

69 Mr Allan Hansard, Chief Executive Officer, National Association of Forestry Industries, *Proof Committee Hansard*, 20 May 2009, p. 63.

6.79 They explained that the effect on the forestry sector of exclusion from the fuel credit scheme would be significant:

> …the exclusion of forestry from the CPRS fuel scheme will impact directly on the small business harvesters. These small businesses are largely run on very tight margins. They do not own trees. They will not get any benefit from the CPRS as such in relation to being able to create credits or anything like that. These businesses purely harvest the trees for the companies or the tree owners, and this is where the impact of exclusion from the CPRS fuel credit scheme will impact. We have done some work with some of these harvesters on what the impact will be; it is likely to be around about $12,000 a year extra. Because we are in very difficult financial times at the moment and, as I said, these small businesses run on tight margins normally, this sort of additional cost or tax on them will have devastating effects. These harvesters and contractors are spread right through rural and regional Australia, so the impact is going to be quite significant right across Australia.[70]

6.80 The AFI observed that the inclusion of reforestation under the CPRS was an effectively limited option:

> At this stage the only options there are forestry, so in carbon sink forestry development, the definition is 0.2 hectares, more than 20 per cent groundcover and capable of growing more than two metres in height. So that gets down to quite small-scale areas of forestry, bearing in mind the transaction costs are likely to make it uneconomic at that sort of [scale]…[71]

Plantations

6.81 Dr Ajani noted that the policy settings proposed in the CPRS led to the perverse outcome that plantations—which were best suited for wood production—were targeted for carbon storage, which was actually best achieved through maintenance and development of self-regenerating forests:

> What we have is a policy frame that…tags plantations to do the job of carbon storage, the job it does worst, and it tags native forest and other self-regenerating systems to do the job of production, when it should be doing the job of carbon storage. It is the wrong way around.[72]

6.82 Dr Ajani classified this as a 'negative incentive' insofar as only one land-use activity out of the whole land-use sector was being encouraged.[73] The Tasmanian Farmers and Graziers Association were also concerned about potential distortions:

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70 Mr Allan Hansard, Chief Executive Officer, National Association of Forestry Industries, *Proof Committee Hansard*, 20 May 2009, p. 81.

71 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, p. 112.

72 Dr Judith Ajani, *Proof Committee Hansard*, 16 April 2009, p. 71.

73 Dr Judith Ajani, *Proof Committee Hansard*, 16 April 2009, pp 90-91.

> We are a bit concerned about the opt-in forestry provisions in the CPRS, mainly not because of forestry per se but because, effectively, forestry now will be the only avenue by which farmers and landowners under this scheme will be able to gain any benefit from the CPRS. Anything else is not allowed, has been excluded or is not in Kyoto, so forestry or timber is the only one left. While many of our members will take advantage of that factor, it has the potential of distorting land use decisions. Therefore, we are a bit concerned about that as well.[74]

6.83 Accordingly, Dr Ajani called for plantations to be excluded from the CPRS on the grounds that they were the least ecologically sound forest land-use activity through which to pursue reforestation and carbon mitigation.

6.84 Greenpeace (Australia) also argued for the removal of plantations from the CPRS due to their impermanence:

> …terrestrial carbon is very impermanent, it is very risky to offset industrial and fossil fuel emissions on it because you are likely to send that carbon stored in terrestrial ecosystems into the atmosphere again. So you would end up increasing emissions and it would become a very expensive way to increase emissions—as opposed to using cost abatement mechanisms.[75]

6.85 This concern was shared by Environment Victoria:

> Tree plantations can help reduce emissions but given their vulnerability to fire and drought they are no substitute for emissions reductions in energy and transport.[76]

6.86 Greenpeace called for plantations to instead be supported through a fund based model:

> The idea of having a fund is that the criteria could be set at such a level to deliver that funding and reduce emissions in a way that did not, for example, impact on extreme biodiversity and water users—which some of the plantation establishment processes may eventuate in. But also the fund based mechanism does not offset emissions.[77]

6.87 In contrast to Dr Ajani and Greenpeace, the CO2 Group argued:

> One of the things about this discussion is that many of the things that we are talking about are not either/or. You can have a CPRS with reforestation in it and still work on some of the opportunities that are probably not best met in the current frame of the CPRS. We are strongly of the view that the CPRS is necessary, and it is necessary to have reforestation in it, because

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74 Mr Nick Flittner, Manager, Drought and Climate Change, Tasmanian Farmers and Graziers Association, *Proof Committee Hansard*, 23 April 2009, p. 20.

75 Mr Paul Winn, Forest Climate Policy Expert, *Proof Committee Hansard*, 21 April 2009, p. 62.

76 *Submission 409*, Attachment 1, p. 3.

77 Mr Paul Winn, Forest Climate Policy Expert, *Proof Committee Hansard*, 21 April 2009, p. 62.

> without that we see the disappearance of a massive investment signal immediately and we go back to where agriculture fundamentally is. We have done a massive amount of research and development. We have made that initial investment and now is the time for Australia to get some of that return on its investment. It is really important not to throw the baby out with the bath water.[78]

6.88 Forestry Tasmania also saw a benefit in the recognition of plantations under the proposed CPRS:

> Another avenue for improving carbon capture is through the establishment of plantations on existing cleared land. We have established a program…where we will partner with private land owners to control noxious weeds such as gorse through the establishment of plantations on their land with the sharing of profits on harvest. Such programs have the opportunity to improve agricultural productivity, diversify farmer incomes, increase forest production, store carbon and enhance rural biodiversity and soil stability. By targeting weedy areas we will not have conflicts with agricultural productivity, and indeed the project could involve extended shelter belt plantings with positive production benefits. Such programs have the opportunity to opt in to the proposed CPRS and we support that position provided the rules of engagement are operationally practical for farm and forest owners.[79]

6.89 On balance, the committee believe that the current forestry settings should remain within the CPRS as they provide one avenue for the rural sector to participate to advantage in the scheme. Evidence provided during the hearings from Private Forests Tasmania indicated that there were real gains to be made for farmers who used whole of farm management planning to manage their properties in a sustainable manner.

Environmental plantings and land management practices

Potential benefits to agriculture

6.90 The committee heard evidence that, in addition to biosequestration of CO_2, reforestation in the form of environmental planting could in its own right deliver significant benefits to agriculture, for example through the restoration of landscapes and the reversal of salinity. The CO2 Group explained:

> You need to separate out the role that plantation forestry plays from carbon sink because one is a tiny subset of a bigger opportunity…[If] you look at the grain belt region of Western Australia, its viability irrespective of climate change and carbon sink depends upon reintroducing trees into the landscape because the area of viable agricultural land is shrinking each year

78 Dr Chris Mitchell, Executive Director, CO2 Group, *Proof Committee Hansard*, 16 April 2009, pp 84-85.

79 Dr Hans Drielsma, Forestry Tasmania, *Proof Committee Hansard*, 23 April 2009, p. 70.

> due to dry land salinity. It is a 20-year research program funded by state and federal governments where over billions of dollars have been spent. It is not a status quo. One of the learnings of Australia is that we have over cleared our landscapes, so there is considerable upside in investment in carbon sinks generally, putting aside plantation forestry.[80]

6.91 Environmental plantings could also deliver benefits for Australia's stressed and damaged river systems, which could assist farmers in adapting to climate change:

> With strategic plantings of environmental plantings it can help to repair degraded river systems by restoring and riparian vegetation along river systems and also reconnecting the fragmented landscape that we have done in Australia over the past 200 years, in particular, in southern Australia.[81]

6.92 Mr Cosier emphasised that, unlike plantations—which some feared could compete with prime food-producing agricultural land under current arrangements—environmental plantings could be undertaken in such a way as not to compete with agricultural land and water resources:

> The advantages of carbon sequestration through environmental plantings is that it can go into areas that do not require large scale forestry soil types or rainfall patterns and it can be on a much smaller scale. In degraded landscapes, such as in the Murray-Darling Basin, every farmer, for example, could probably revegetate 10 per cent of their property with almost no economic loss, but massive environmental gain as well as a carbon sink gain. If you look at it from a forest industry plantation perspective, yes, there are serious finite physical limits on where you can have forestry plantations. But in terms of environmental plantings in degraded landscapes in southern Australia, I think it is an open book, and I think the opportunity is there in the work I am aware of and that will be released soon that is quite staggering and, to be honest, very exciting.[82]

6.93 Finally, Mr Cosier emphasised the opportunities that biosequestration offered for farmers in terms of new income streams, given the right policy settings:

> The overall message is that a range of options is available to a range of people, but the bottom line is the profoundly large income stream into rural Australia that does not currently exist and profound opportunities for multiple environmental benefits. One physical example is that if in 1788 we knew what we now know, we would not have cleared the vegetation on our river systems. We would have left corridors of native vegetation along the river systems. A carbon price gives us the opportunity to put back those corridors of native vegetation.

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80 Mr Andrew Grant, Chief Executive Officer, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 77.

81 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 78.

82 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 98.

> Most farmers that I know of would be delighted for someone to pay them just to plant a strip of vegetation along their rivers to improve the water quality in the river system. The impact on production would be quite minimal, but the overall land scale benefits for the Murray-Darling Basin are quite profound.[83]

6.94 Greenpeace emphasised improved land management to keep terrestrial carbon locked up as a priority issue for Australia's climate policy.[84]

Case studies

6.95 The committee received evidence of environmental planting projects that provided practical examples of how policy settings which allowed credits to be generated for reforestation activities could lead to productivity and environmental benefits on agricultural land, and new income streams for farmers.

6.96 Mr Rob de Fégely noted that 'environmental credits had an enormously valuable and potentially very powerful role to play in addressing these [land use] problems that we have in Australia'.[85] These land use issues were ultimately related to the ongoing health and viability of Australia's rural and regional communities. He explained:

> By putting a price on the environment—and carbon is the most obvious one, but there are other values out there that you can potentially value—you can provide income to repair these problems. It was government policy, in many cases, for landowners to clear land when we were developing the agricultural industry. We need a government policy to assist in that repair process. We can concentrate production on the most productive land. We do get a chance to look at land-use planning. We can reward good management and sound stewardship both pre and post 1990. That is important because, in my view, people who did some pretty good things back in the 1950s and 1960s should not be disadvantaged by the introduction of an emissions trading scheme. You can create the incentive for people who own land throughout regional Australia to develop and improve sustainable land management.[86]

6.97 Mr de Fégely provided a specific example to the committee which demonstrated the synergies that existed between reforestation or native bush regeneration activities and CO_2 mitigation. The project involved a wheat-cropping farm in Western Australia suffering salinity problems. The areas of salinity were planted out with trees and native vegetation, representing an area of around 18 to 20 per cent of the property, in an effort to control the rise of the watertable (the cause

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83 Mr Peter Cosier, Director, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 99.

84 Mr John Hepburn, *Proof Committee Hansard*, 21 April 2009, p. 58.

85 Mr Rob de Fégely, *Proof Committee Hansard*, 21 April 2009, p. 30.

86 Mr Rob de Fégely, *Proof Committee Hansard*, 21 April 2009, p. 31.

of salinity). The plantings also offered protection from wind erosion, as well as biodiversity benefits.[87] The project had already received praise as a:

> …large scale, tangible demonstration of how rural Australia can maintain its agricultural production while also sequestering large amounts of carbon and protecting the environmental and cultural values of their properties.[88]

6.98 A second example was a project in Northern Australia involving savanna fire management. Mr de Fégely noted that wildfires in this region of Australia were common and contributed to around three per cent of Australia's greenhouse gas emissions. The program involved the 'substantial' reduction of emissions from wildfires through early season controlled burning and management. Were such CO_2 savings able to be accounted for in the CPRS, the income derived from the carbon credits this generated in turn could support the employment of traditional landowners to manage the fire regime. Related benefits could include the control of pest plant and animal species and surveillance of remote regions; the lower intensity of the fires also could avoid some of the impacts on biodiversity of uncontrolled wildfires.[89]

6.99 Mr de Fégely noted that approaches that sought to retain agricultural production while addressing environmental and ultimately climate problems required assistance to farmers to provide the skills and financial ability to learn and undertake such projects.

6.100 In terms of biodiversity, Mr de Fégely noted that there was a need to consider biodiversity credits, which, properly designed, could provide an income stream to farmers for both past and future preservation of forests and woodlands:

> …[Farmers can be given incentives by being given] the option to be able to ensure that they can get credits for existing vegetation. For instance, if you have got a standing red gum woodland or a standing yate woodland, depending on where you are, and you fence that off and part of the processes is that you can claim the credits for the existing trees which are already there, which gives you income to ensure that you can then create the additional biodiversity in that environment, then you are changing and improving the biodiversity in a particular region.[90]

Reforestation and job creation

6.101 The CO2 Group emphasised the potential for all forms of reforestation to provide broader social benefits, such as job creation, based on its potential income streams and positive agricultural and environmental benefits:

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87 Mr Rob de Fégely, *Proof Committee Hansard*, 21 April 2009, pp 31-32.

88 Mr Rob de Fégely, *Proof Committee Hansard*, 21 April 2009, p. 33.

89 Mr Rob de Fégely, *Proof Committee Hansard*, 21 April 2009, p. 32-33.

90 *Proof Committee Hansard*, 21 April 2009, p. 40.

> In terms of job creation it is quite significant. The areas that our business operates are in the very marginal of farmland regions in Australia that are dying naturally and slowly through ageing rural communities, marginal viable land practices and increasing difficulty with climate change in itself. To diversify those landscapes is good policy and you are injecting economic investment in very marginal parts of Australia that have not had it for a long time. It is not a one-off investment. If you establish your dedicated carbon sink you get ongoing labour through management and protecting the asset. You get job creation through the measurement of the carbon, the scheme compliance and the commerce that underpins it. You are creating new economic activity that is ongoing for a 50-, 60- or 80-year period and it is quite substantial.[91]

6.102 The CO2 Group advised:

> So far we have at least a 1.5 multiplier in our company, so that for every job that we create directly there is at least 1½ full-time equivalents out there. There are jobs in developing the nurseries and propagation. There are jobs in land preparation, land acquisition and negotiation. There are jobs through carbon accounting itself. There are additional investments in research and development and, on the financial side, doing the permit creation and so on.[92]

Committee comment

6.103 The committee notes that reforestation has a great potential to contribute to Australia's greenhouse gas reduction targets, particularly given its recognition under the Kyoto protocol as a form of greenhouse gas mitigation. However, the committee heard much evidence that questioned whether reforestation activities should be included under the CPRS, given possible distortions to land use decisions that could affect such things as food security, and which could see plantation-based reforestation preferred over possibly more effective abatement options through the preservation of native forest carbon stores.

6.104 In terms of environmental plantings and land management, the committee was impressed by the potential for positive financial and environmental outcomes for Australia's agriculture and land use sector, if there were suitable incentives for farmers and land managers in place. The committee heard impressive examples of programmes for environmental plantings and land management that could also lead to substantial carbon abatement and mitigation, as well as environmental and farm productivity, outcomes. The committee agreed that Australia would receive significant benefit from focusing more of its efforts and resources on research and scheme development in the area of environmental planting and land management activities.

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91 Mr Andrew Grant, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 77.

92 Dr Christopher Mitchell, Executive Director, Corporate Development, CO2 Group, *Proof Committee Hansard*, 16 April 2009, pp 84-85.

Recommendation 10

6.105 The committee recommends that the Government promote the testing, development and roll-out of environmental restoration and land stewardship schemes, giving priority to schemes that can make a significant contribution to emissions reductions, agricultural productivity and biodiversity conservation.

Deforestation

Deforestation under the Kyoto Protocol and the CPRS

6.106 Under the Kyoto Protocol rules, Australia is liable for emissions from deforestation or land clearing. However, the government's proposed CPRS will not include deforestation. The *White Paper* stated that this was because the potential number of liable entities and monitoring, reporting and compliance complexities meant it was impractical to do so.[93]

Emissions from deforestation

6.107 The committee heard that deforestation is a very significant contributor to global CO_2 emissions. For example, tropical rainforest clearing is contributing to total global emissions in the order of eight to 20 per cent.[94] Dr Michael Raupach observed that in Australia:

> We are still logging native vegetation at a rate, from memory, of something like 60 million tonnes of carbon a year…[95]

6.108 Professor Will Steffen noted the superior carbon storage characteristics of native natural ecosystems:

> …natural ecosystems, as a general rule of thumb, maximise carbon storage compared to any human planted system…So by removing an old growth forest, you have removed a very rich carbon store. Even by replanting with trees, you will not get back the carbon you had in the original ecosystem. That is true in savannahs and it is true in grasslands as well, although they put the carbon in different parts of the ecosystem. A very good rule of thumb is that natural ecosystems have maximised storage for that particular type of climate and soil.[96]

6.109 Dr Heather Keith explained the significance of existing terrestrial carbon stores in terms of potential release of CO_2:

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93 *White Paper*, p. 6-61.

94 Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, p. 79.

95 Dr Michael Raupach, *Proof Committee Hansard*, 15 April 2009, pp 100-101.

96 Professor Will Steffen, *Proof Committee Hansard*, 15 April 2009, p. 101.

> One [role of the terrestrial biosphere] is the existing stock of carbon in the biosphere, in the vegetation in the soils. This is a very large amount of carbon. For example, in the native forests of South-East Australia it is seven gigatonnes of carbon. A gigatonne is 10 to the power of nine. You compare that with the annual emissions of greenhouse gases in Australia, which are approximately 152 megatonnes of carbon per year. A megatonne is 10 to the power of six. It is very important that this stock of carbon be protected to avoid any future emissions.[97]

6.110 A number of other submitters and witnesses also emphasised the importance of preserving existing carbon stores via avoided deforestation. On this issue Dr Raupach observed:

> …the requirement in our whole terrestrial carbon sector…is to become a net sink for carbon. Clearly reduction in rates of deforestation is an important contribution to that.[98]

6.111 The Australian Conservation Foundation believe 'there is a big potential to reduce our emissions if we protect the standing native forests'.[99]

6.112 Dr Keith noted that current areas of forest that have been harvested hold carbon stores well below their carrying capacity. Such areas needed to be prioritised as carbon sequestration sites and to be free from disturbance by human activity, which would maximise their performance as carbon sinks. Such an approach would also have the benefit of ensuring these forests did not require any inputs of energy.[100]

6.113 Given the carbon storage characteristics of native natural ecosystems, and their resilience and self-regenerative capacity under Australian conditions, Dr Ajani argued that climate policy in relation to mitigation and adaptation through the forest land use sector should reflect the following principles:

> a. Avoid emissions from deforestation and forest degradation by protecting existing carbon stocks in primary forests and woodlands, i.e. do not clear or log these ecosystems.
>
> b. Maintain, or where necessary, re-establish the restorative capacity of deforested and degraded natural ecosystems to ensure maximum carbon sequestration as they return to their full carbon carrying capacity.
>
> c. For natural forests and woodlands devoid of restorative capacity, reforest using mixed native species to enhance resilience and therefore long-term

97 Dr Heather Keith, *Proof Committee Hansard*, 16 April 2009, p. 70.

98 Dr Michael Raupach, *Proof Committee Hansard*, 16 April 2009, pp 100-101.

99 Owen Pascoe, Australian Conservation Foundation, *Proof Committee Hansard*, 20 May 2009, p. 39.

100 *Proof Committee Hansard*, 16 April 2009, p. 84.

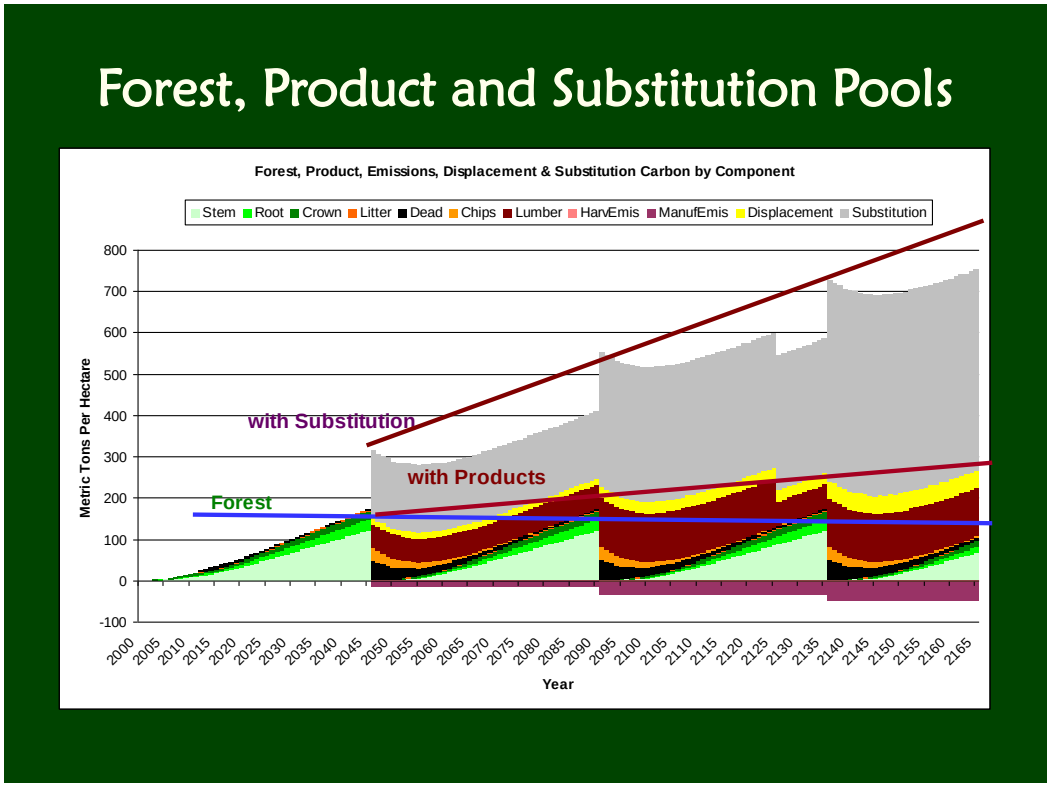
carbon storage capacity. Reforestation should make use of remnant natural forests and woodlands.[101]

6.114 In contrast to the views outlined above, Forestry Tasmania advised the committee that managed forests 'lead to increased wood storage and emissions over time'.[102] They explained:

> This is as a result of three interrelated factors—the storage of carbon in the forest themselves, the storage of carbon in harvested wood products—whether in use or disposal—and, finally, the avoided emissions or substitution that arises from the use of wood products, including wood based energy production, instead of more energy intensive products or fossil fuel based energy sources.[103]

6.115 Forestry Tasmania provided the committee with Chart 6.1, which illustrates the capacity of managed forests to lead to increased wood storage and reduced emissions over time.

Chart 6.1



Source: College of Forest Resources, University of Washington.

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101 *Submission 340*, pp 1-2.

102 Dr Hans Drielsma, Executive General Manager, Forestry Tasmania, *Proof Committee Hansard*, 23 April 2009, p. 68.

103 Dr Hans Drielsma, Executive General Manager, Forestry Tasmania *Proof Committee Hansard*, 23 April 2009, p. 68.

6.116 Given the capacity for wood products to persist, Forestry Tasmania called for the explicit recognition of wood products as a form of biosequestration in emissions trading frameworks.[104] This view was supported by NAFI:

> …in a post-Kyoto agreement we are looking for the recognition of carbon stored in our wood products.[105]

6.117 The National Association of Forest Industries called for the broad inclusion of the forestry industry under the CPRS:

> NAFI advocates the full inclusion of forestry activities in the proposed Carbon Pollution Reduction Scheme given its significant potential for providing low-cost emissions abatement.[106]

International deforestation

6.118 The Government has acknowledged the importance of deforestation:

> If we are going to curb global emissions we need to deal with deforestation…Deforestation accounts for approximately 18 per cent of global greenhouse emissions, with around 13 million hectares of the world's forests being cleared each year.[107]

6.119 Greenpeace noted that the government recently announced a policy on reducing emissions from deforestation and forest degradation in developing countries (REDD). This would involve the generation of credits from reductions in deforestation from an agreed level.

6.120 Greenpeace expressed concern over the potential for the use of a market based mechanism such as REDD to reduce emissions from deforestation. In particular, they pointed to resistance to such an approach from the EU and Brazil. Further, they noted 'significant risks' related to the permanence of forest offsets, given their vulnerability to 'fire, pest and disease and weather events'. Losses to such forces could see developing countries lose credits in addition to having foregone, for example, agricultural development.[108] There was also a question over the ability of developing countries to administer effective systems of measuring, reporting and verifying emission reductions; concerns about deforestation leakage to countries not

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104 Dr Hans Drielsma, Executive General Manager, Forestry Tasmania *proof Committee Hansard*, 23 April 2009, p. 69.

105 Mr Allan Hansard, Chief Executive Officer, *Proof Committee Hansard*, 20 May 2009, p. 63.

106 Mr Allan Hansard, Chief Executive Officer, *Proof Committee Hansard*, 20 May 2009, p. 63.

107 'Australia's contribution to a global agreement on climate change', Speech to the Lowy Institute for International Policy, by the Minister for Climate Change, Senator the Hon. Penny Wong, 20 April 2009, p. 8.

108 Mr Paul Winn, Forest Climate Policy Expert, Greenpeace Australia, *Proof Committee Hansard*, 21 April 2009, p. 60.

participating in the REDD program; and the potential for the REDD mechanism to drive down the price of carbon credits and to lock-in 'dirty technology.[109]

6.121 Dr Keith, however, noted that developed nations are not currently part of the REDD scheme; and suggested that Australia should pursue the inclusion of developed nations in this scheme in future international negotiations, including at Copenhagen.[110]

6.122 On this issue, Mr Cosier offered the following policy options:

> …there are three ways we can do it in Australia, and these would be Kyoto compliant things to do. Whilst they are not in the CPRS, they would assist Australia's targets. One is that you could regulate to further reduce land clearing. For example, in New South Wales and Queensland there is effectively no regulation on urban clearing, so that would be one method—urban development. The second is to require land clearing to buy an emissions permit, in the same way you require a fossil fuel emitter to buy an emissions permit. The third is to provide incentive mechanisms such as buying back regrowth clearing rights in Queensland.[111]

Committee comment

6.123 The committee notes that the issue of deforestation, both nationally and internationally, must be a central concern of climate policy if there is to be a successful effort to reduce and stabilise atmospheric concentrations of CO_2 within the range recommended by the current science. In particular, the committee notes that existing forests represent a massive store of carbon that has to be effectively managed in order to ensure that Australia can reduce its emissions into the future.

6.124 The committee notes that deforestation is not proposed to be included in the CPRS; and that, in relation to international deforestation, there are conflicting views on current proposals to reduce deforestation in developing countries. Given the potential significance of deforestation to global emissions and reductions of CO_2, the committee felt there is considerable scope for Australia to develop a more comprehensive policy approach in this area. The committee urges the government to establish a policy development that brings together all stakeholders to establish a comprehensive set of policy settings process on national and international deforestation.

Soil carbon

6.125 As noted above, a number of submitters and witnesses felt that storage of carbon in soil could provide a significant source of greenhouse gas mitigation.

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109 Mr Paul Winn, Forest Climate Policy Expert, Greenpeace Australia, *Proof Committee Hansard*, 21 April 2009, p. 61.

110 Dr Heather Keith, *Proof Committee Hansard*, 16 April 2009, p. 84.

111 Mr Peter Cosier, Wentworth Group of Concerned Scientists,, *Proof Committee Hansard*, 16 April 2009, p. 82.

Mr Cosier, discussing the importance of pursuing strategies that contribute to the removal of carbon from the atmosphere, observed:

> …the only way we can possibly achieve a 450 target, given the fact that we have already exceeded it, is to reduce emissions from the atmosphere. One of the great opportunities that we see, both globally and in Australia, is the opportunity of using terrestrial carbon, that is, trees and soil carbon, to contribute to a greenhouse gas emission level reduction in the atmosphere.[112]

6.126 However, the NFF observed:

> Obviously there is a lot of debate about the extent of the opportunities through soil carbon and the different practices that can generate positive soil carbon outcomes.[113]

Biochar

6.127 A number of submissions and witnesses raised the issue of biochar with the committee. Biochar is a form of charcoal that is created through pyrolysis of biomass such as food scraps and agricultural waste. In simple terms, pyrolysis is the heating of a substance in the absence of oxygen.

6.128 Biochar, as a form of charcoal, is both stable and high in carbon content. As such it is proposed as a form of carbon capture and storage to help mitigate greenhouse gases. As an additional benefit, when it is added to soil biochar raises the soil's carbon content and therefore its quality and productivity. The submission of Professor Syd Shea, Director of Science, Rainbow Bee Eater Pty Ltd, referred to crop yield increases of more than 100 per cent, and expected permanent reductions in the use of fertilisers.[114]

6.129 However, Dr Jones expressed concerns over the viability of biochar, particularly in relation to the economics of transporting the biomass and subsequent biochar:

> …biochar is…a hugely expensive extravagance. It costs an absolute fortune to get biomass to the place where you undertake the pyrolysis and then you have to transport it again out to farms…It would improve the soil, but it is an engineering solution to a biological problem.[115]

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112 Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 15 April 2009, pp 77-78.

113 Mr Charles McElhone, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 16.

114 Professor Syd Shea, Director of Science, Rainbow Bee Eater Pty Ltd, *Submission 765*, p. 3.

115 *Proof Committee Hansard*, 16 April 2009, p. 15.

6.130 In contrast, Mr Frank Strie, of BEST Energies Australia, advised the committee that he believed biochar could be cost-effective and profitable.[116] This would involve the generation of power from the pyrolysis of biomass, producing biochar, which created two income streams from its production. The submission of Professor Shea noted that 'modern pyrolysis technologies…recover significant amounts of oil and gas as a by-product of the biochar production process'.[117]

6.131 Further, Mr Strie advised that there were abundant and cheap sources of biomass as raw material for the production of biochar. This included a wide range of otherwise waste material, such as agricultural waste and the large amounts of household garden and food waste generated by cities.[118]

6.132 Professor Shea proposed an integrated business model for the viable production and use of biochar on a large scale. This would involve multiple regional nodes for the production of biochar and by-product fuels, thereby reducing the transport costs referred to above. In the case of the demonstration project outlined in his submission, biomass would be sourced from harvested mallee, wheat straw and other local sources, which could be a potential source of reforestation if systematically grown and harvested. The by-product fuels from pyrolysis could be used to make renewable electricity or possibly as feed stock for higher value uses such as liquid fuels.[119]

6.133 Professor Shea estimated that biochar technology could potentially mitigate 100 million tonnes of carbon per annum for under $20 per tonne.[120]

Australian Soil Carbon Accreditation Scheme

6.134 Dr Jones, the founder of the Australian Soil Carbon Accreditation Scheme, advised the committee of her system of raising soil carbon, which she believed had significant potential to mitigate CO_2 and so contribute to Australia's greenhouse gas reduction targets

6.135 Dr Jones emphasised the importance of soil carbon as a potential means of sequestering atmospheric CO_2 and, more generally, as a key driver for soil health or quality. Dr Jones advised the committee on a proposed stewardship scheme which had the potential to provide a 'financial incentive for biosequestration of atmospheric carbon in agricultural soils,[121] also improving the productive capacity of farm soils.

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116 Mr Frank Strie, BEST Energies Australia,

117 *Submission 765*, p. 3.

118 Mr Frank Strie, BEST Energies Australia, *Proof Committee Hansard*, 23 April 2009, p. 87.

119 *Submission 765*, pp 4-5.

120 *Proof Committee Hansard*, 30 April 2009, p. 130.

121 *Proof Committee Hansard*, 16 April 2009, p. 73. See also *Submission 765*.

6.136 Dr Jones explained the principles of the scheme:

> In farming, we have pastures or crops with green leaves and they sequester that carbon. They turn the gas into a liquid in the leaves in the form of soluble glucose through the process of photosynthesis. It is using a natural process of photosynthesis to sequester that and then that goes out into the soil through the roots. It is as a liquid. It is dissolved carbon and it is humified in the soil. What we are talking about is using land management methods that ensure that there is living ground cover there year around. The 22 million hectares of crops [in Australia] that you talked about at the moment have plants living there in winter when the wheat and barley is growing, but then over summer they are bare, so that the carbon goes back to the atmosphere from that soil. We have developed methods of planting those crops into perennial ground cover so that in summer it is still alive, living and still sequestering carbon.[122]

Committee comment

6.137 The committee acknowledges the potential for soil carbon to contribute to Australia's reduction of emissions and adaptation to climate change, and was impressed by the potential of some of the various techniques and technologies that were considered in the course of the inquiry.

6.138 The committee notes that there is no silver bullet solution to climate change, and that a successful effort to reduce Australia's emissions, particularly in relation to agriculture and land use, will necessarily rely on an array of complementary approaches. With this in mind the committee believes that the role of government is to provide an environment where innovation is encouraged and supported to provide effective solutions that can prove themselves and compete in national and international spheres.

Recommendation 11

6.139 The committee recommends that the Government promote the testing, development and roll-out of soil carbon technologies and schemes, giving priority to schemes that can make a significant contribution to emissions reductions and soil health.

Carbon accounting

6.140 Carbon accounting refers to the method by which levels of carbon emissions and reductions are measured, such as for assessing compliance for Kyoto Protocol purposes or under the proposed CPRS.

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122 *Proof Committee Hansard*, 16 April 2009, p. 74-75.

6.141 As is clear from the discussion below the particular rules of carbon accounting—to the extent that they do not recognise particular sources of emissions or emission reductions—act as a powerful incentive or disincentive for particular strategies for greenhouse gas mitigation and abatement.

Carbon accounting under the Kyoto Protocol and the CPRS

6.142 The Department of Climate Change advised the committee on the development of Australia National Carbon Accounting System (NCAS):

> …has been driven by the treatment of these emissions under the Kyoto protocol and the significance of land-based emissions to Australia's overall greenhouse emissions profile. In that context Australia over the last decade has built up a world leading and scientifically robust capability in carbon measurement and accounting in land systems.[123]

6.143 The initial priorities for developing the system were on 'meeting the compulsory Kyoto protocol reporting requirements for deforestation and establishment of new forests, including commercial and environmental plantings'.[124]

Need for changes to accounting rules

6.144 The committee found there was a high degree of consensus across submitters and witnesses, representing a broad range of interests, in relation to shortcomings in both the international system of carbon accounting and Australia's carbon accounting system.

6.145 The Department of Climate Change, while noting that Australia followed the international accounting rules, advised that there were a number of 'simplifications and constructions' that were not the preferred approach and which Australia had been seeking to change:

> Those assumptions are things like a presumption that biomass fuels are treated as zero emissions. Harvesting of trees are treated under the Kyoto protocol as an immediate emission when clearly this table here is not an emission; it is a carbon stock and there is a decision to be made at the end of the useful life of this table as to what happens with that carbon stock.[125]

6.146 The West Australian Farmers' Federation noted that in order to change Australia's accounting rules the international rules would need to changed:

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123 Mr Ian Carruthers, Department of Climate Change, *Proof Committee Hansard*, 1 May 2009, p. 2.

124 Mr Ian Carruthers, Department of Climate Change, *Proof Committee Hansard*, 1 May 2009, p. 2.

125 Mr Ian Carruthers, Department of Climate Change, *Proof Committee Hansard*, 1 May 2009, p. 6.

> …the Australian CPRS has to be in agreement with the Kyoto rules or the international accounting rules. That is why I say to you that what we need this government to do is change those international accounting rules...[126]

6.147 Dr Raupach discussed the importance of a globally comprehensive and consistent method of carbon accounting:

> We need a full carbon account. It is very important in constructing that full carbon account, which has to be global because the carbon is globally shared, it is very important to distinguish the processes and the exchanges of carbon between the earth's surface and the atmosphere, which we are managing, as humans, and those which we are not. The reason for that is that if we do not make that distinction, then there is an enormous temptation to, as it were, socialise some of the losses and to count processes which are occurring or would have occurred anyway as mitigation.[127]

6.148 Dr Ajani noted that 'a coherent climate change policy requires comprehensive greenhouse gas accounting systems'.[128] She believed that both the international and Australia's systems of carbon accounting were seriously flawed to the extent that they did not properly recognise the land use sector. This meant that significant opportunities for mitigation were being overlooked:

> Australia uses the Kyoto accounting system to report its greenhouse gas emissions and, whilst its treatment of fossil fuels is good, its treatment…of the land use sector is seriously flawed. As a result, we have significant climate change mitigation actions that make ecological and economic sense that simply do not hit the political radar.[129]

6.149 The Australian Farm Institute emphasised the importance of seeking to change the current carbon accounting rules in light of present shortcomings:

> For Australian agriculture that is more important than any target—a more comprehensive accounting system that recognises both sequestration and emissions from agriculture as opposed to current systems, which only recognise gross emissions…The three rules that are critical are the net-net accounting requirement, the lack of separation of natural and man-made changes in emissions and the 'one in, all in' rule—in other words, you could not put just a paddock or a few areas of agriculture in; you had to put in the whole lot.[130]

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126 Mr Dale Park, Western Australian Farmers Federation, *Proof Committee Hansard*, 20 April 2009, p. 103.

127 Dr Michael Raupach, *Proof Committee Hansard*, 15 April 2009, p. 102.

128 Dr Judith Ajani, *Proof Committee Hansard*, 16 April 2009, p. 90.

129 Dr Judith Ajani, *Proof Committee Hansard*, 16 April 2009, p. 90.

130 Mr Mick Keogh, Executive Director, Australian Farm Institute, *Proof Committee Hansard*, 21 April 2009, pp 112-4.

6.150 The NFF also stressed the need for international rules to account for sequestration of carbon in relation to agricultural land use. He commented:

> So there are some additional elements there [needing recognition]. In terms of the natural disturbance issue, which is really at the heart of the problems with recognising soil carbon and other means of sequestration, our understanding is that there is a lot of traction there because it makes sense. This is about stopping the things that we can control, not the things that we cannot. Clearly, bush fires and drought have emissions profiles, and farmers should not be penalised for those emissions sources.[131]

6.151 The CO2 Group raised an issue in relation to problems with accounting for the effects of fire:

> When people are talking about full carbon accounting it is all true, but there is a nasty part Australia and that is that it is a fire-prone continent. If we are going to go to full carbon accounting we have got to manage the understanding of the emissions associated with fire, and the science of that is pretty thin. We know the accounting rules at the moment are wrong. They assume that when a fire goes through you lose all of the carbon. Anyone who has just inspected what has happened in Victoria knows that is not true, but how much carbon you lose with what sort of fire, over what time frame, and when it goes back is actually not documented in a robust, scientific accounting way.[132]

Current efforts

6.152 The NFF had been seeking to have the international accounting rules changed so that farmers could get credit for carbon sequestration:[133]

> Anthropogenic and non-anthropogenic [emissions] and differentiating those impacts to distinguish between things that farmers can contribute [to] and things they have no bearing on is the essence of the issue.[134]

6.153 Mr Cosier noted that Australia was being proactive in trying to secure changes to international carbon accounting methods:

> …there is a lot of activity at the official level pushing for a whole carbon accounting mechanism in the Copenhagen process. At the international level there is great discussion about what is called REDD and whether or not REDD is simply to incentivise the reduction in clearing of developing

131 Mr Charles McElhone, National Farmers' Federation, *Proof Committee Hansard*, 20 May 2009, p. 81.

132 Dr Chris Mitchell, Executive Director, CO2 Group, *Proof Committee Hansard*, 16 April 2009, p. 85.

133 Mr Ben Fargher, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 15.

134 Mr Charles McElhone, National Farmers' Federation, *Proof Committee Hansard*, 15 April 2009, p. 16.

> country forests or, again, to go to a whole carbon accounting process for tropical forests.[135]

6.154 The Department of Climate Change advised on Australia's position on carbon accounting for the purposes of international negotiations:

> In the negotiations, we have been strongly advocating for and giving considerable priority to the argument that we should have comprehensive accounting of the land systems that reflects the proposition that we measure, report and account the actual emissions that are occurring at the time and place at which they occur. In other words, we do not have spatial and temporal dislocation with things like assumptions about wood products—for instance, harvesting being an immediate emission when clearly in both space and time it is not an immediate emission. In the energy and industrial sectors, we follow a principle of emissions being reported at the time and place at which they occur, and that is the proposition which we think should underpin the accounting for the land systems.[136]

6.155 Dr Graeme Pearman felt that although it was unlikely that methods of biosequestration would be included in the CPRS in the short term, it was nevertheless important to begin to establish more comprehensive forms of carbon accounting as part of Australia's policy response to climate change:

> …in the short term, and that is the term of the CPRS, we are not going to have those capabilities of including those systems immediately. That is why I think the concept of still supporting them in some way within the framework of the overall policy response of government is important so that we can build the capabilities of that sector that eventually should be incorporated into the total trading system when it is ready.[137]

6.156 Mr Andrew Macintosh, Associate Director, ANU Centre for Climate Law and Policy, also noted that it could take 'quite a long time' to achieve full carbon accounting. He therefore urged immediate action on including deforestation in the CPRS, given it was already covered under the present accounting rules:

> Under the existing rules, we have 60 to 70 million tonnes worth of CO_2 and, where that is emitted from deforestation, it is the equivalent of 400,000 hectares a year. We can move on that very quickly and get very cheap abatement in that sector.[138]

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135 Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Proof Committee Hansard*, 16 April 2009, p. 82.

136 Mr Ian Carruthers, Department of Climate Change, *Proof Committee Hansard*, 1 May 2009, p. 6.

137 *Proof Committee Hansard*, 15 April 2009, p. 100.

138 Mr Andrew Macintosh, Associate Director, ANU Centre for Climate Law and Policy, *Proof Committee Hansard*, 15 April 2009, p. 101.

6.157 Mr Cosier expanded on the potential economics of Mr Macintosh's suggestion:

> I will just pick up the point that if we are still emitting 60 million tonnes a year from deforestation of Australia, at a $40 carbon price, if my maths is right, that is around [$2.4] billion to the Australian economy. We might find that if you brought avoided deforestation into the CPRS or into some other government policy framework, immediately you would fundamentally change those economics.[139]

6.158 Witnesses also noted that the question of accounting for the efficiency of plantation and native forests as carbon stores was dependent on the use to which harvested plantation trees were put, such as furniture, paper products and building materials.[140]

6.159 Mr Macintosh pointed to an important distinction between deforestation and forestry management. In the case of the former, most of which occurred for agricultural purposes, there was an immediate release of carbon followed by the fairly rapid release of the remainder through burning or degradation. In relation to forestry, however, it was necessary to consider the use the product was put to in order to properly account for its contribution to atmospheric CO_2.[141] Dr Raupach also addressed this issue:

> I am not familiar with the particular study that you cited on the 30 per cent figure. This just gives me one opportunity to state for the record that I am appearing in a personal capacity for this inquiry, not as a CSIRO scientist. But the implication of that figure is that we are going to be increasing our stock of the various stores of carbon, including timber, paper and whatever else is being produced from the forest into the future…So a good assessment of the residence times of these carbon pools before the inevitable and eventual release of this carbon back to the atmosphere occurs is a critical part of this process.[142]

6.160 Mr Cosier noted that the timber industry stood to benefit:

> Even though the current rules do not provide a credit, if you like, for storing that carbon in, say, houses or furniture, timber products are going to be major, major winners in any carbon price scenario simply because they displace energy intensive products, such as aluminium, steel and brick manufacture and cement, which are all high greenhouse-emitting products. Even with the current Kyoto rules, the forest product sector, or the timber

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139 *Proof Committee Hansard*, 15 April 2009, p. 101.

140 *Proof Committee Hansard*, 15 April 2009, p. 103.

141 Mr Andrew Macintosh, Associate Director, ANU Centre for Climate Law and Policy, *Proof Committee Hansard*, 15 April 2009, p. 103.

142 *Proof Committee Hansard*, 15 April 2009, p. 104.

> plantation sector, would be a major beneficiary from the high price of carbon.[143]

6.161 Professor Steffen offered a cautionary perspective on the importance of full carbon accounting:

> We need to take care not to isolate the climate change carbon issue from other values that forests provide for society and for nature. There is a lot of concern, for example, in the biodiversity conservation community that ill-conceived carbon schemes that involve forests and indeed other ecosystems could give you disbenefits for biodiversity. There is clear feeling that we need to think broadly and carefully with a whole systems approach, not just full carbon accounting…We need to look at the other benefits that natural ecosystems provide.[144]

Committee comment

6.162 The committee notes there was a very significant level of agreement among stakeholders about the need to reform national and international accounting rules to accurately and comprehensively reflect carbon fluxes, emissions and reductions across natural system and all facets of human activity.

6.163 The committee also acknowledges that this task is likely to take a significant period of time to achieve in international negotiations; and the commitments and efforts that Australia has made to date to achieving reform of carbon accounting rules.

Recommendation 12

6.164 The committee recommends that the Government takes steps to ensure that Australia encourages reform of international carbon accounting rules.

Recommendation 13

6.165 The Committee recommends that the Government provide greater funding so that recommendations 8, 9, 10, 11 and 12 can be implemented in a timely manner.

Senator the Hon Richard Colbeck

Chair

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143 *Proof Committee Hansard,* 15 April 2009, p. 104.

144 *Proof Committee Hansard,* 15 April 2009, p. 104.

AUSTRALIAN LABOR PARTY

DISSENTING REPORT

About the inquiry

The Senate Select Committee on Climate Policy has thoroughly examined the *Carbon Pollution Reduction Scheme Bill 2009*, related bills, climate change science and the overall Government response to climate change.

The Committee heard ten days of evidence and 188 witnesses, in Canberra and in five state capitals, with a number of these witnesses appearing multiple times. We heard from witnesses representing Government departments, industry associations, businesses, trade unions and community organisations, and including leading scientists and economists. This included more than 100 witnesses representing mining, industry, farming, energy supply, financial and commercial interests.

The committee received over 8,000 submissions from organisations and individuals (not counting more than 6,000 form letters).

The Economics Committee is also currently concluding an inquiry into the *Carbon Pollution Reduction Scheme Bill 2009* and related Bills as introduced into the Senate and is due to report at the same time as this Select Committee Inquiry.

This is in addition to inquiries examining related issues of energy sustainability and supply including the Government's solar rebates scheme, feed-in tariffs, and fuel and energy issues.

There is no weight to any arguments that there has not been adequate opportunity for the Senate to examine the Carbon Pollution Reduction Scheme (CPRS) bills or for the Australian community to present their views to the Senate

We would like to thank the Committee's Secretariat for their work in ensuring the smooth running of the hearings. We thank all those who appeared before the Committee and made submissions. We believe that the Committee's work has once again highlighted the necessity of taking strong, effective action on climate change.

We are not surprised that the Committee has been unable to make a unanimous report to the Senate. It became evident during the hearings that there is a deep division within the Committee: between the majority of members, who believe that urgent action is needed to combat dangerous climate change in Australia, and the Liberal and National Senators, who do not.

The Liberal and National Senators either do not believe in the reality of the threat posed by dangerous climate change to Australia or they believe that Australia should wait for an international agreement on emissions reduction before taking any action.

The incapacity of the Liberal and National parties to reach agreement on a way forward in tackling climate change has been detrimental to Australia's ability to take action on climate change.

It is unfortunate that the leader of the opposition, Mr Turnbull, has been unable to convince the Coalition parties that it is in the national and global interest to adopt a realistic and progressive approach to the global challenge of climate change. Political leadership is needed from Mr Turnbull to stare down the climate sceptics and deniers within the coalition. So far he has not been up to the task and he has allowed this sceptical attitude towards the well founded theory of anthropogenic climate change, supported by the great majority of the world's respected scientists, to inhibit the coalition from developing a sound policy that takes responsible action to tackle climate change. Climate change is the greatest political, economic, environmental and social challenge facing the world and political leaders must not abdicate their responsibility to future generations for political expediency and personal political gain.

Within the majority of the Committee that supports action, however, there are also differences – between the Labor Senators, who support the CPRS bills as proposed by the Government; the Greens Senator, who supports much higher, and in our view unachievable, targets and opposes some particular aspects of the scheme; and the Independent Senator, who believes we should be pursuing a different scheme and strategy to reduce emissions.

Summary of Government Senators' position

Government senators believe that the urgency of the situation in which Australia finds itself, after a decade of inaction on climate change, requires that a decision must be made by the Parliament, this year. It is in the interests of the environment, the economy, and future generations that we put in place a scheme that will enable Australia to reduce its greenhouse gas emissions before irreversible damage is done to our environment and our economy. We also believe that an emissions trading scheme is the best way to do this, because it is a scheme based on market mechanisms rather than taxation or Government regulation.

We believe that the targets for cutting emissions set out in the CPRS are the most realistic and attainable targets for Australia at this time, and will, if put into legislation, enable Australia to go to the UN Climate Conference in Copenhagen in December in a strong position to argue for an international agreement to cut global emissions to the degree necessary to stabilise the Earth's climate before the warming of the planet becomes irreversible and catastrophic.

The CPRS is the Government's central policy that will drive the economic transition required to tackle climate change, but it is not the only part of the Government's response. The CPRS will be part of a comprehensive strategy to tackle climate change that includes a range of measures. The Parliament will shortly consider an expanded Renewable Energy Target that will take Australia's renewable electricity generation to

20% by 2020. The design of the Renewable Energy Target (RET) was agreed between the Commonwealth and state governments after detailed consultation with industry, including extensive modelling of the costs and benefits of the expanded target. This measure is an important complement to the CPRS and should have been implemented years ago.

Alongside the CPRS, the Government is also proposing a $2.7 billion Climate Change Action Fund to help businesses make the transition to a low-carbon economy. We believe that that the Government should fast-track detailed design of the Climate Change Action Fund once the CPRS legislation has been passed by the Parliament in order to help Australian businesses play their full part in creating the low-pollution jobs of the future.

We are aware that the transition from the New South Wales Greenhouse Gas Reduction Scheme may adversely affect certain electricity generation projects that use waste coal mine methane. The committee affirms its support for the Government to continue to work with the governments of New South Wales and the Australian Capital Territory to clarify transitional arrangements for such projects, noting that a carbon price is essential for the ongoing support of electricity generation from low-emission sources.

Australia's carbon pollution needs to be reduced from as many sources as possible. While agriculture has been excluded from the CPRS until no earlier than 2015, we believe the Government should closely monitor the impact of the CPRS on the agriculture sector, including processing industries, to ensure that any perverse outcomes are addressed. We welcome the Government's establishment of a ministerial roundtable to look at policy options for reducing carbon pollution in the agriculture sector, and believe that the Government should continue to fund research into reducing agricultural carbon pollution and preparing the agriculture sector for the impacts of unavoidable climate change.

Emissions reductions from the land sector will play an important part in reducing Australia's total human-induced carbon pollution. We welcome the Government's efforts to improve international land sector rules in a post-2012 agreement, to provide a stronger, long-term basis for an international climate change response which recognises the full mitigation potential of the land sector.

We also welcome the Government's ongoing commitment to fund research into soil carbon and biochar, and to explore the role that soil carbon might play in the international post-2012 outcome.

In the light of these considerations, we therefore do not support any of the recommendations supported by some or all of the other members of the Committee. We believe that all of these recommendations suffer from one of two deficiencies. Either they deal with matters which the Government is already proactively addressing, or they propose actions which would impose further and unacceptable delays in the implementation of an emissions trading scheme.

We acknowledge that the measures contained in the Government's proposals are far-reaching and will involve substantial changes for many Australian industries, businesses and individuals. We point out, however, that we have now had many years of debate on this issue, particularly since the transparent policy development process undertaken by the Government following on from the Garnaut Review. This process saw the Green Paper, White Paper and Exposure Draft Legislation released for business and community consultation before the legislation was brought into Parliament. We have also had two recent Senate inquiries and the most comprehensive modelling ever undertaken by Treasury on the impacts of both action and inaction.

It is therefore impossible to argue with any credibility for further delay, on the basis of a lack of consideration and consultation on behalf of the Government. It is our firm view that, based on the evidence to this committee and other Senate inquiries, the case for the Government's approach has been well made. We believe that the time for more reports, more modelling, more debate, has passed, and that the time for action in the national interest is upon us.

Australia needs to act on climate change

There is an overwhelming consensus among climate scientists, both in Australia and internationally, that climate change caused by human activity is posing a major and rapidly escalating threat to the Earth's physical environment, to the economies of every country, and ultimately to the sustainability of human life on this planet.

The Committee went to great pains to hear from all points of view among the scientific community. We did not hear or receive one piece of testimony from a scientist with qualifications and experience in the field of climate science which dissented from this view. The "climate sceptics" had a golden opportunity at the Committee's hearings to challenge this consensus, and they were not able to produce one qualified climate scientist to do so.

Instead we heard from a retired geologist and an engineer. With due respect to these witnesses, we do not believe that their testimony presented any effective scientific challenge to the views of the overwhelming majority of qualified climate scientists. The points they made have been refuted many times by climate scientists, and were refuted again at our hearings.

Australia is uniquely vulnerable to the effects of escalating climate change. The Garnaut Review found that, if greenhouse gas emissions continue unchecked during the first half of this century, the resultant rise in temperature will have a severe impact on Australia's environment and economy.

By mid-century, unless action is taken, rising temperatures and declining rainfall will result in major declines in agricultural production across the country, and output from irrigated agricultural output in the Murray-Darling Basin will halve. We will also see the destruction of the Great Barrier Reef by mid-century. Australia's alpine environments will largely cease to exist. Rising sea levels will destroy many beaches and severely affect coastal communities. Australia's tourist industry and the

communities which depend on it would be devastated. Tropical diseases and pests would spread across large areas of Australia, further reducing agricultural production and endangering animal and human health.[1]

At the last election, both major parties promised to introduce an emissions trading scheme to reduce Australia's carbon pollution. Mr Turnbull, when he was Environment Minister in the Howard Government, supported an emissions trading scheme. He told the National Press Club in May 2008: "The emissions trading scheme is the central mechanism to decarbonise our economy." Since then he has steadily retreated from this position, apparently under pressure from climate sceptics in his own party and from the National Party. Nevertheless, the Australian people voted overwhelmingly in 2007 for parties committed to an emissions trading scheme. Every poll shows that the Australian people continue to support strong action against climate change. The Government has a mandate to act on this matter, and should do so without further delay. The Australian people will judge harshly those parties or individual legislators who place our country's economic and environmental future at risk by obstructing action on such a vitally important issue.

The Rudd Government's CPRS sets realistic and attainable targets for reducing Australia's greenhouse gas emissions, targets which will enable Australia to act independently, while providing leadership and working to achieve an international agreement on reducing emissions. The current scheme is in fact similar to the model put forward by the former Government's Prime Ministerial Task Group on Emissions Trading headed by Dr Peter Shergold, and adopted as policy by the Howard Government.

The current scheme, like that proposed, but not acted on, by the previous Government, seeks to reduce greenhouse gas emissions in a way which minimises the impact on employment, investment and the standard of living of the Australian people. It seeks to do so at the lowest cost to the economy.

Treasury modelling demonstrates that it is possible to take strong action to reduce carbon pollution while preserving growth in incomes and employment across the economy. The Government, as part of its consultation processes with business and the community, announced some changes to the scheme, which we welcome. Our view is that the Government's scheme as it now stands will ensure robust growth in the Australian economy and should be passed by the Senate.

Deferral of action and claims of unilateralism

We do not accept the view that Australia should wait until there is an international agreement on climate change before taking action. We also reject the view that Australia will be alone in taking such action. A global agreement to cut greenhouse

1 UN Food and Agriculture Organisation, *Climate Related Transboundary Pests and Diseases*, February 2008, page 2

gas emissions is the most desirable way to proceed. Nevertheless, other countries are acting in advance of such an agreement, and so should we.

When Australia's scheme comes into effect, we will be joining many other countries which are implementing such a scheme. Many countries already have in place domestic policies and measures which seek to reduce their greenhouse gas emissions.

A number of the major economies have set emissions reduction targets and have in place, or are developing emissions trading schemes as their central emissions mitigation policy. Other developed economies are already adapting to a carbon-constrained future. The countries of the European Union have centres of expertise in fuel-switching, using biomass in coal-fired electricity generation, and are working with developing countries through the Clean Development Mechanism under the Kyoto Protocol. Carbon prices feature in all major investment decisions relating to plant and infrastructure in Europe. Europe is adding significant new wind energy capacity each year.

Important research is being undertaken around the world on carbon capture and storage technology, not only for the coal industry but for other high-emission industries where there is limited or no capacity to reduce carbon emissions through changes to the production processes.

We reject the view, frequently expressed by some members of the Committee and also by some witnesses, that because Australia is responsible for only 1.5% of the world's greenhouse gas emissions we can afford to wait until there is an international agreement. Australia is in fact in the top 20% of emitters in absolute terms.[2]

If all the countries which emit less than Australia were to follow this logic and do nothing, that would mean that 20% of the world's greenhouse gas emissions would continue unchecked. As a wealthy country with one of the world's highest *per capita* levels of greenhouse gas emissions, Australia has an obligation to act.

Developing countries such as China and India have made it clear that they are not willing to make the sacrifices necessary to reduce their emissions unless the developed countries do so as well. Ethically, we cannot argue with that view, since the current climate crisis was caused by the unrestrained consumption of fossil fuels by the developed countries – not least Australia. Even if we did not accept the logic of that position, it remains a political fact. The Indian High Commissioner recently said specifically that India will not act if Australia does not.[3]

Evidence from the Department of Climate Change demonstrates that, far from acting unilaterally, Australia is in fact lagging behind many countries in dealing with

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2 United Nations Framework Convention on Climate Change, Greenhouse Gas Inventory Data - Detailed data by Party, http://unfccc.int/di/DetailedByParty.do

3 'Why should we suffer over carbon emissions, asks India', *The Age*, 27 May 2009

greenhouse gas emissions. *(We have presented this information as an appendix to this report.)*

Our targets are realistic and attainable

Many people are calling for higher targets than those contained in the scheme proposed by the Government. We listened carefully to the evidence presented by environmentalist groups and others who hold this view. Our view, however, is that the targets set out in the CPRS are the highest which are realistically attainable in Australia in the current circumstances while maintaining economic growth, job creation, improved standards of living and a reductions in greenhouse gas emissions that meets meaningful environmental goals.

Australia is a heavily carbon-dependent economy, and that cannot be changed overnight, or even in a few years. If there is an international agreement to reduce emissions by 25% by 2020, Australia will be bound by that agreement and will take steps to meet our international commitments.

We point out again that this urgency has been imposed on Australia by the failure to act on climate change over the decade 1997-2007, when the previous Government was in office. Those who were responsible for that inaction are in no position now to criticise the current Government for deciding to take decisive action.

Why we support the Carbon Pollution Reduction Scheme

Some critics of the CPRS assert that Australia should adopt an alternative approach to reducing emissions such a carbon tax, an "emissions intensity" approach or a hybrid model. We listened carefully to arguments on this issue. We are not persuaded that any of them are superior, either in terms of the outcome delivered or in terms of the impact on the Australian economy. To abandon the CPRS now and switch to some other model would entail years of further delay, for no clearly demonstrated benefit. Emissions trading emerging as the dominant policy for reducing carbon pollution around the world. By introducing an emissions trading scheme, Australia is joining a growing group of countries that have developed or are developing similar schemes.

Abandoning the CPRS and adopting some other approach would isolate us from the emerging world consensus about the best way to deal with the challenge of climate change. Australia's international climate change obligations are all framed in terms of quantity reductions in emissions. For that reason, the CPRS involves setting a quantitative target for emissions reductions. Under other approaches such as the McKibbin-Wilcoxen model or a carbon tax, the Government would not be able to control directly the volume of emission reductions or provide support to the community and business.

The most established emissions trading scheme is the 27-member European Union Emissions Trading Scheme, introduced in 2005. The EU-ETS is currently in its second phase (which runs from 2008 to 2012). In the United States, President Obama has confirmed he is committed to the introduction of a cap-and-trade emissions

trading scheme to reduce greenhouse gas emissions by 80% below 1990 levels by 2050. A draft Bill to establish an emissions trading scheme is progressing through the US Congress. The New Zealand parliament passed legislation in September 2008 introducing a mandatory national cap and trade emissions trading scheme. The New Zealand Government is currently reviewing the design of its emissions trading scheme, but has reaffirmed its commitment to emissions trading.

The Opposition has argued that Australia should wait until after the United States has passed emissions trading legislation, because it will be the "benchmark" for emissions trading schemes around the world. We reject this view. The CPRS has been designed to suit Australia's economy and to allow our scheme to link with other schemes internationally. It will form part of a network of linked emissions trading schemes around the world.

Some have asserted that the current US draft bill provides more assistance to emissions-intensive trade-exposed industries than the Australian scheme does. This is incorrect. The Waxman-Markey draft bill has set a hard cap on allocations to these industries at 15% of total permits in 2014. The number of permits that will be allocated to these industries over subsequent years will be directly linked to the decline in the US cap on emissions, with no provision for increased allocations in relation to growth in these industries. The Waxman-Markey bill does not give more certainty to trade-exposed firms than does the Carbon Pollution Reduction Scheme.

The CPRS legislation provides sufficient flexibility to the Minister to set the scheme caps and gateways by regulation after agreement is reached at the UN Climate Conference in Copenhagen. In addition, the Australian scheme – including levels of assistance to trade-exposed industries – will be periodically reviewed in light of international developments.

The scheme will not damage the Australian economy

Opposition members of the Committee argued that the CPRS will cause unacceptable damage to the Australian economy, particularly to export industries and to carbon-intensive industries such as coal-mining, electricity generation and cement manufacturing. We do not share this view. Although we acknowledge that the necessity to reduce greenhouse gas emissions poses serious challenges to these and other industries, we believe that with appropriate assistance all these industries, and the economy as a whole, will adapt to the requirements of a carbon-constrained economy, and that the economy as a whole will continue to have robust growth.

We note that Treasury modelling presented to the Committee showed that the Australian economy will continue to grow strongly as we reduce carbon emissions. It also showed that the earlier Australia acts, the lower the cost of action will be. Conversely, the longer we delay, the more damage we risk to the Australian economy. We know from the Treasury modelling that many of Australia's key industries will become more, not less, competitive, in a carbon-constrained world.

We accept the evidence put before the Committee that when the CPRS is in place, average annual GNP growth will only be one tenth of one percent less than it would be if no action was taken to tackle climate change. In all scenarios modelled by Treasury, total employment in the economy grows strongly over the years to 2020 and 2050 with the CPRS. We also note the CSIRO's modelling, which concluded that achieving a rapid transition to sustainability would have little or no impact on national employment.[4]

Critics of the Government's scheme have been very selective in their use of the economic evidence put before this and other inquiries into the Carbon Pollution Reduction Scheme. While they have been quick to highlight claims made by some industry lobbyists that the scheme will damage some industries, they have ignored testimony from industries which will benefit from the Scheme.

In particular they have ignored the witnesses who noted that the Scheme will stimulate a rapid growth in "green jobs," not only by creating new industries but through the "greening" of traditional industries. Dr Heinz Schandl of the CSIRO told the Senate Economics Committee inquiry:

> The number of jobs will grow, both in business-as-usual and in a scenario which takes into consideration all the things that have been described in the green paper that would happen in the emissions trading scheme. Overall, the number of jobs will increase over the next two decades—2.5 to 3.3 million new jobs, and 230,000 to 340,000 of these new jobs are in those sectors which we have identified as high-impact sectors, with regard to resource use, energy use and emissions.[5]

On 4 May, the Government introduced a range of measures to respond to the global recession, including a global recessional buffer applied to the free permits for emissions-intensive trade-exposed industries, a one-year delay to the start of the scheme, and a one-year fixed price period. We welcome these measures, which provide further transitional support to allow businesses to adjust to a carbon-constrained economy.

Climate policy and employment

On 22 May, the Minerals Council of Australia released a report it had commissioned from Concept Economics; the aim of which was to "address the lack of sub-sector and local community impacts and to provide a realistic picture of the impact of the proposed ETS on economic activity and jobs at a local level in regional Australia –

4 Dr Heinz Schandl, Senior Science Leader, CSIRO Sustainable Ecosystems, *Senate Economics Committee Hansard*, 25 March 2009, pp. 24–25.

5 Dr Heinz Schandl, Senior Science Leader, CSIRO Sustainable Ecosystems, *Senate Economics Committee Hansard*, 25 March 2009, p, 33.

focusing on the employment impact in the minerals sector."[6] The report gained widespread media coverage, much of it alarmist and highly misleading.

The source of much of the inaccurate reporting of the Minerals Council report was a media release issued by the Minerals Council on the evening before the release of the report. According to the media release:

> The Concept Economics modelling shows that 23,510 direct jobs will be lost across Australia's minerals industry by 2020 and 66,480 by 2030. The 2020 figure represents an 11% drop in overall employment in the minerals sector while the 2030 result is a 24% increase.[7]

However the report itself says:

> It is estimated that there will be approximately 23,510 less people employed in the Australian minerals industry due to the imposition of the proposed ETS *than would have otherwise been the case*. This represents a fall in employment of 11% relative to the reference case.[8]

The Chief Executive Officer of the Minerals Council, Mr. Mitchell Hooke was questioned about this apparent definitional confusion during a hearing of the Senate Economics Legislation Committee held in Canberra on 29 May:

> Senator PRATT—Mr Hooke, you have reported on your website a growth of about 86,000 jobs from 2008 to 2020. Is that the business as usual case that Dr Fisher was using?
>
> Dr Fisher—I am unaware of what is on the Minerals Council website. My reference case is the reference case that is generated by our model.
>
> Senator PRATT—What were the numbers in your reference case?
>
> Mr Hooke—Pretty damned close.
>
> Dr Fisher—I do not know what those numbers are now.
>
> Senator PRATT—If I take 86,000 jobs minus 23,000 jobs I have still got a growth of about 63,000 jobs in that period across the sector.
>
> Mr Hooke—Let us go back and do them, since you have directed the question to our work, which is a bit hard for Dr Fisher. We had the National Institute of Labour Studies give us an estimation of what numbers of jobs we would need to create if we were to maintain market share. As a 2020 Vision project analysis we said, 'If we were to meet projected global demand by 2020 and Australia was to increase its supply, what level of supply would we need to increase and what would that mean in terms of

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6 *The Employment Effect on the Australian Minerals Industry from the Proposed Carbon Pollution Reduction Scheme in Australia*; Report prepared for the Minerals Council of Australia by Concept Economics, 21st May 2009; p.4.

7 *23,510 Jobs Lost in the Minerals Industry Under Emissions Scheme*; Minerals Council of Australia media release, 22nd May 2009

8 Minerals Council report; op cit p.13 (emphasis added)

> jobs? ' They came out with a figure of 86,000. Back then it was on about 120,000-plus people we employed. When you put that 86,000 on a projected basis on top of the 142,000, which is an increase over the last five years of some 60,000-odd jobs already, and then you look at what Dr Fisher has done and you say, 'If there's an 11% fall relative to the reference case' and you add the figures together, they are actually not far off being similar.
>
> Senator PRATT—That goes back to the point. What has been reported in the media are massive job losses, but we keep losing the tagline relative to what would otherwise have been the case, which is that 86,000 jobs.
>
> Mr Hooke—That is our work. You asked me how it related to Dr Fisher's work. I am saying it is approximate. You cannot put words into Dr Fisher's work.
>
> Senator PRATT—No, but whatever your relative baseline is we are still looking at growth across the sector.
>
> Mr Hooke—With great respect, we are not suggesting this is scorched earth. We know we are going to continue to grow.[9]

While there remains some uncertainty about just what the Minerals Council's employment reference case is, on the conservative side it appears to be aggregate employment growth of around 80,000 new jobs in the minerals sector to 2020 in a business as usual scenario.

It is clear from the exchange above and from any reasonable reading of the Minerals Council report that, contrary to alarmist predictions of major job losses in the minerals sector relative to today, employment in the minerals sector in the period to 2020 is likely to grow by the order of 55,000 to 60,000 jobs. Applying the multiplier adopted by the Minerals Council in its report, total employment in regions reliant on mining and processing would grow, at a conservative estimate, by a further 110,000 jobs.

It is misleading to present potential future jobs that are not created in one sector of the economy as "jobs lost". To do so not only offers a misleading picture of the effects of an ETS, but fails to take account of the fact that capital and employment moves between industries and regions all the time. Indeed, the available evidence suggests that the recent mining boom resulted in significant movement of labour from all over the country into regions with high levels of mining activity, resulting in skill shortages in other industries and regions.

The capacity of the labour market to adapt to structural change appears to be ignored in much of the debate about the CPRS. In the decade to November 2007, employment in rural industries dropped by almost 100,000; employment in manufacturing dropped by almost 50,000 and employment in the wholesale trade dropped by 35,000. Yet over this period the unemployment rate fell from 8.5% to 4%. These sectoral changes were brought about by a range of factors – public policy, drought, changed capital flows,

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9 *Proof Committee Hansard,* 29 May 2009, pp. 50-51

international competition, to name just a few – all of which bring about structural change in the wider economy and result in the relative share of employment changing from one sector to another.

While not everyone will welcome these changes, there are many actions governments can take to cushion the transitional effects of such changes. The Government is taking such action, providing very substantial assistance to the mining industry, especially coal mining, to adjust to change in the relative price of their products. The Government is providing $100 million to accelerate the deployment of commercial scale carbon capture and storage projects through the Global Carbon Capture and Storage Institute and $2.4 billion in Commonwealth funding for carbon capture and storage that will help leverage $1 billion in industry funding and a further $500 million in state government funding. In addition, the Government has outlined $750 million in transitional assistance targeted at those "gassy" coal mines that will incur higher than normal carbon price liabilities.

Throughout the inquiry, Coalition Senators and others have sought to downplay and ridicule the very significant growth in jobs throughout the economy that will occur as a result of the transition to a low carbon economy. However, many witnesses and submitters to this and other Senate Committee inquiries touching on this subject have spoken of the potential for jobs growth under an ETS regime and a mandatory renewable energy target:

> There are very significant opportunities for enterprise and employment, provided a signal is sent to assure people who might be prepared to make those investments and take people on—that there is a future for them. I do think there is going to be a transition, and I do think there is going to be some time where communities go through some changes, but there have to be huge chances for employment.[10]
>
> I think the Clean Energy Council estimated that around 50,000 jobs were required just for the 20% renewable energy target.[11]
>
> The model actually has rapid growth in green jobs...[12]

A number of witnesses noted that much of the growth in employment would result from a greening of traditional industries, rather than jobs growth in necessarily new low carbon industries:

> In the main we do not see there is a dramatic shift from blue collar skills to "green collar" skills. A tradesperson doing maintenance on a wind turbine

10 Mr Tony Westmore, *Senate Standing Committee on Economics, Proof Committee Hansard*, 23 March 2009, p. 24

11 Dr Ottaviano, Carnegie Corporation, *Senate Standing Committee on Economics, Proof Committee Hansard*, 23 March 2009, p. 33

12 Mr Danny Price, *Proof Fuel and Energy Select Committee Hansard*, 2 April 2009, p. 18

> for a wind generation farm would have the same skill sets to do a gear box on a coal crusher.[13]
>
> The number of jobs will grow, both in business-as-usual and in a scenario which takes into consideration all the things that have been described in the green paper that would happen in the emissions trading scheme. Overall, the number of jobs will increase over the next two decades—2.5 to 3.3 million new jobs, and 230,000 to 340,000 of these new jobs are in those sectors which we have identified as high-impact sectors, with regard to resource use, energy use and emissions.[14]

The committee heard that in the United Kingdom, business is much more positive about the prospect of employment growth:

> It is of no surprise that the CBI [Confederation of British Industry] should be an advocate for economic instruments to reduce greenhouse gas emissions across the UK economy, and it is of no surprise to see them argue for greater clarity and a longer term framework for public policy to reduce emissions, because the CBI wants to see UK business position itself to be a winner from the technological and business innovation associated with coping with climate change.[15]

The Chief Scientist for Australia, Professor Penny Sackett, in a speech to participants in the 2009 Science Meets Parliament on 17 March 2009, outlined the contribution science will make to the creation of new jobs and new technologies, leading to new jobs throughout the economy:

> Thanks to investment made over the last many, many decades in basic and applied research, nearly every area of science and technology can contribute. Mathematicians will continue to refine the algorithms that solve the complex set of equations that describe the Earth system. Marine scientists will collect more data on the impact of climate change on the oceans, in particular the role of our southern oceans in the great circulatory system of the planet that differentially distributes heat to coastlines around the world.
>
> Biologists and ecologists will monitor the effect on plant and animal life, and propose ways for reducing the negative impacts where possible. Astronomers and space scientists will study the natural greenhouse effect on other planets and monitor changes in the earth with remote sensing. Physicists and electrical engineers will improve solar energy solutions already in massive use in the United States, Europe and elsewhere, and no doubt invent some of their own.
>
> Mechanical engineers, aerodynamicists and material scientists will refine the windmills that already provide 20% of Denmark's power. In some

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13 Mr Dave Oliver, *Proof Committee Hansard*, 22 April 2009, p. 7

14 Dr Heinz Schandl, *Senate Standing Committee on Economics, Proof Committee Hansard*, 25 March 2009, p.33

15 Mr James Cameron, *Proof Committee Hansard*, 30 April 2009, p. 5

> countries, the production of nuclear energy will increase. Microbiologists and geneticists will work to develop crop varieties that are more adaptable to the changing climate.
>
> Architects and building engineers, together with individual citizens and businesses, will work on efficiency measures that will decrease the end use of energy, thereby reducing costs, saving CO2 emissions, and increasing comfort. Forestry scientists and agriculturalists will improve land management techniques to increase the ability of the land to absorb carbon.
>
> Chemists and industrial scientists will refine techniques for coal and gas-fired electricity generation to reduce emissions. More efficient and portable fuel cells will be developed and put into routine use. Engineers and technologists will work feverishly to test whether carbon geosequestration can be effectively applied at the massive industrial scales required.
>
> More high voltage DC power lines will be installed to transport large amounts of energy over long distances more efficiently. All of these things can happen and need to happen immediately. For the medium term, soil scientists and agronomists will be examining how carbon can be stored in soils, including the possible use of biochar to act as a carbon sink and improve land productivity. Electrical engineers and software scientists will be developing smart power grids that can put power where it is needed when it is needed.
>
> Second- and third-generation biofuels will be investigated as an alternate fuel source by biochemical engineers. And in the longer term still, geologists and geoengineers will study deep geothermal "hot rock" energy while theoretical and experimental physicists continue to work on nuclear fusion as alternate source of energy. Can this all be done? In fact, much of it is already being done around the world in regions that have realised the social and economic advantages of leading the transition to the new low-carbon world.[16]

We note that a number of reports and forecasts, produced both in Australia and overseas, that present a very positive future for job creation under the Government's climate policy settings, provided that the necessary supporting measures are implemented.

In a June 2008 report to the Dusseldorp Skills Forum[17], the CSIRO examined the skills, innovation and workforce dimensions of the transition to a low carbon economy with a particular focus on labour market effects involved in achieving meaningful cuts in greenhouse emissions. Key results of the research include:

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16 *Science and Parliament: Engaging in Changing Climate;* Comments from the Chief Scientist to participants in the 2009 Science Meets Parliament, Speech at the Great Hall, 17 March 2009.

17 Hatfield-Dodds, S. G. Turner, H. Schandl and T. Doss; *Growing the Green Collar Economy: Skills and labour challenges in reducing our greenhouse emissions and national environmental footprint.* Report to the Dusseldorp Skills Forum, CSIRO Sustainable Ecosystems, Canberra, June 2008

- Well designed policies can substantially decouple economic growth from environmental pressure, so that living standards continue to increase at current rates (avoiding blockages that might otherwise occur), while Australia's national greenhouse emissions are reduced over time.
- Achieving a transition to sustainable greenhouse emissions levels would have little or no impact on national employment, with projected increases in employment of 2.5 to 3.3 million jobs over the next two decades.
- Employment in sectors with high levels of emissions will also grow strongly, with projected increases of more than 10% over ten years. This will add 230,00 to 340,000 new jobs - in addition to normal labour turnover – in the transport, construction, agriculture, manufacturing and mining sectors. Employment in construction and transport services is expected to grow faster than the national average.

The report also concludes that the transition to a low-carbon economy will require a large-scale mobilisation of skills and training, and that attention must be paid to both incentives for environmental performance and the skills required to deliver this performance.

We reject the gloomy and at times deliberately misleading prognoses for employment bandied about by those who are opposed to taking action on climate change or who seek to protect the competitive advantage having no carbon price confers on existing technologies over new, emerging technologies in which a carbon price is effectively embedded.

The economic implications of not passing the CPRS

Delaying action on climate change is economically irresponsible. Delay will have a range of negative effects on the Australian economy, including deterring investment decisions and delaying business planning decisions, where the price of carbon is a feature of those decisions.

In 2007, the Shergold Report expressed the fear that "waiting until a truly global response emerges before imposing an emissions cap will place costs on Australia by increasing business uncertainty and delaying or losing investment." Evidence before the Committee indicates this fear was fully warranted.

Business is fully cognisant of these difficulties, understands that they affect a wide range of both low-carbon and emission intensive industries, and expects the Australian Parliament to take action to resolve them this year:

> The issue that we face is that there is a strong political will and popular will to have Australia act on climate change. In view of that we assess that business needs to know for investment certainty reasons and business planning reasons—it needs to get a better picture of what that policy direction will be in order to make investments. This applies in for example the renewable area; it applies in the electricity generation area; it applies in

> a whole lot of area... Our position is that we ought to have legislation this year.[18]

Emission intensive industries need the benefit of a framework within which they can acknowledge their carbon liabilities. In particular, the business community is concerned that a failure to act could have adverse implications for the security of Australia's electricity supply:

> We think that in order to secure ongoing electricity supply in Australia we need to make investments very soon. That has been quite apparent for some time.[19]

Those with an interest in the development of low carbon industries are also concerned that business opportunities will be missed if the Australian Parliament fails to provide a framework to guide investment decisions in those industries:

> In many ways, if Australia does not get on board this train soon, we will be left behind. Our tragic history is one of coming up with the good ideas, but allowing that to go overseas for jobs and profit. We have seen that in solar technology and other technologies.[20]

The dangers of uncertainty for business were clearly identified by the submission of the Australian Bankers Association (ABA) to the committee:

> Climate change has considerable economic, social, environmental and business risks. Continuing uncertainty is disrupting the efficiency of existing markets as well as creating difficulties with regards to financing terms and investment decisions. Australia needs leadership and early action to provide business, investment, operational and market certainty. It is important for Australia to take action now and minimise the impacts of uncertainty.

The ABA also clearly identified business opportunities that will be lost if action is not taken now:

> Climate change also presents considerable opportunities. Trading, product creation and ancillary services (including risk consulting, funds management, legal and accounting) should be developed as export services regionally and globally. … It is important for Australia to take action now and take advantage of the opportunity to position itself as a 'carbon hub' within the Asia-Pacific region.[21]

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18 Peter Burn, *Senate Standing Committee on Economics, Proof Committee Hansard* 29 May 2009, 15

19 Peter Burn, *Senate Standing Committee on Economics, Proof Committee Hansard* 29 May 2009, 17

20 John Connor, *Senate Standing Committee on Economics, Proof Committee Hansard*, 29 May 2009, 53

21 Australian Bankers Association, submission 411 to the Senate Select Committee on Climate Change, page 4

Australian businesses know that climate regulation is inevitable. But ongoing uncertainty about what form that regulation will take is imposing real costs today. Uncertainty is the enemy of investment, and therefore of job creation. Electricity generation investments are not being made because the future price of carbon cannot be factored in. Low pollution jobs are not being created today because businesses can't be certain about the climate policy framework. We are holding back the inevitable transformation of the economy – and that means it will be more costly later.

Ongoing uncertainty about how carbon will be priced will have a deadening effect on our industrial innovation and competitiveness. Australia will lack a coherent framework to guide the economy through the transition to a low carbon economy. Rewards could be distorted – industries of the future will struggle to get off the ground while those that must adapt will put off essential changes.

Australia will take on binding commitments at Copenhagen and will need a policy that is tailored to our economy to fulfil those commitments. The alternatives to introducing emissions trading are a distant second-best and much more costly. Once again, business is fully cognisant of this:

> Our position is that, if we do not see a carbon price signal emerge fairly quickly, we will be inundated with other forms of regulation that will cost the economy more than if we had a market based approach.[22]

Without the CPRS in place, Australia would need to adopt other measures to meet the targets that Australia will agree to at Copenhagen. Business-unfriendly measures like complex additional project approval processes or regulating emissions levels industry-by-industry will raise the cost of reducing Australia's emissions – and those costs will be borne by all Australians through higher prices and a lower standard of living.

The solution is to give Australian industry every opportunity to adapt swiftly and seamlessly to the reality of a carbon-constrained future. Passage of the CPRS legislation will encourage industry to continue to improve its performance in relation to emissions and to take advantage of emerging opportunities in a carbon-constrained environment, while supporting emissions-intensive trade-exposed (EITE) industries to enable them to maintain their competitiveness through the transition.

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22 Peter Burn, *Senate Select Committee on Climate Policy, Proof Committee Hansard* 20 May 2009, 74

Recommendations

Recommendation 1

1.1 That the Senate pass the CPRS bills without delay and without amendment.

Recommendation 2

1.2 That the Government fast-track detailed design and roll-out of the Government's proposed Climate Change Action Fund once the CPRS legislation has been passed by the Parliament, in order to help Australian businesses play their full part in creating the low-pollution jobs of the future.

Recommendation 3

1.3 That the Government continue to work with the NSW and ACT 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.

Senator Doug Cameron
ALP, New South Wales

Senator Mark Furner
ALP, Queensland

Senator David Feeney
ALP, Victoria

Senator Louise Pratt
ALP, Western Australia

Appendix: Domestic Climate Change Policies of Major Economies[23]

Note on interpreting greenhouse gas emissions data

Analysis of global emission trends is hampered by the lack of comprehensive high-quality data. Reliable annual national figures are available for carbon dioxide (CO_2) emissions from fossil fuel use. Data for other sources of CO_2 (particularly deforestation) and for other greenhouse gases (such as methane and nitrous oxide) are much more limited. 2000 is the most recent year for which a complete set of emissions data is available, so it serves as the baseline for comparing national emissions in this document.

Brazil

In 2000 Brazil's total greenhouse gas emissions totalled 2,313.8 Mt CO2-equivalent (CO2-e), comprising 5.7% of global emissions, making it the 5th largest emitter. Fifty-nine% of Brazil's greenhouse gas emissions in 2000 were from deforestation. Brazil's CO2 emissions (not including land use, land use change and forestry) grew by around 70% between 1990 and 2005.[24]

Brazil ranks relatively low in energy-related carbon emissions as it derives the majority of its energy from hydropower and biomass.[25] Brazil's high usage of biofuels stems from its concerns about energy security after the first oil crisis.

Brazil's domestic mitigation policies include a tax incentive for buyers of cars with low-powered engines, production and use of ethanol and sugar-cane bagasse (the fibrous residue remaining after sugarcane stalks are crushed to extract their juice), development of a natural gas industrial market, and use of alternative energy sources for power generation. Mandatory efficiency standards for household appliances, lighting products and motors; appliance and lighting standards were enacted in 2001.[26]

On 1 December 2008, Brazil announced targets to reduce annual deforestation rates with an ultimate goal of limiting the annual deforestation rate to around 5,500 square kilometres by the end of 2017.

On 13 April 2009, the Brazilian Environment Ministry announced measures that will make operational licenses for new fossil fuel power stations contingent upon

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[23] Background document prepared by the Department of Climate Change, updated 2 June 2009

[24] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 and 27 May 2009

[25] Pew Centre, Climate Change Mitigation in Developing Countries, 2003. Available online at: http://www.pnl.gov/aisu/pubs/CCMitDevCo.pdf. Accessed on 7 July 2008

[26] IEA Climate Change Policies and Measures Database. Available at: http://www.iea.org/textbase/pm/index_clim.html. Accessed on 7 July 2008.

commitments to offset a portion of the stations' emissions by planting trees. This follows wide-spread criticism from environmental groups of Brazil's 10-year energy plan, published in January 2009. The plan aims to increase domestic generation capacity by building 68 fossil fuel power stations, mainly run on coal and oil, to prevent future power shortages. This expansion would reportedly cause a near tripling of Brazil's emissions from the energy sector by 2017.

Canada

In 2000 Canada's greenhouse gas emissions totalled 765.5 Mt CO2-e, comprising 1.9% of global emissions, making it the 11th largest emitter. Canada's CO2 emissions (not including land use, land use change and forestry) grew by around 27% between 1990 and 2005.[27]

Canada is projected to exceed its Kyoto Protocol target of 94% of 1990 emissions levels (2007 emissions were 126% of 1990 levels).[28] Canada has publicly stated that it is unlikely to meet its target through domestic measures, but it will not purchase international credits through the Protocol's flexibility mechanisms to do so.[29]

The Government has set a long-term domestic target of reducing emissions by 20% from 2006 levels by 2020, and by 60 to 70% of 2006 levels by 2050.

In October 2006, Canada announced its intention to introduce a domestic emissions trading scheme by January 2010, based on reducing the emission-intensity of major industrial sectors including electricity, oil and gas, iron and steel, cement, and chemicals and fertilizer.[30] Development of the proposed scheme has now been halted, and Canada is now working with the United States to develop a co-ordinated approach. At the G8 Environment Ministers Meeting in Siracusa, Italy, in April 2009, Canada's Environment Minister Jim Prentice announced that Canada will have a suite of emissions reduction policies in place in time for the Copenhagen round of negotiations.[31]

Several Canadian provinces have also joined North American regional emissions trading schemes (see United States section) and one province, Alberta, has its own

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[27] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 and 27 May 2009

[28] Canada' 2007 Greenhouse Gas Inventory, http://www.ec.gc.ca/pdb/ghg/inventory_report/2007/som-sum_eng.cfm. Accessed on 2 June 2009

[29] Former Canadian Environment Minister, under the current Harper Government noted Canada "would not send tax payers money overseas to buy credits." Source: Rona Ambrose speech to Canadian Parliament 11 May 2006

[30] Environment Canada web site "Turning the Corner: Regulatory Framework for Greenhouse Gas Emissions" (March 2008). Available at: http://www.ec.gc.ca/doc/virage-corner/2008-03/541_eng.htm. Accessed on 7 July 2008

[31] Calgary Herald (May 7, 2009) "Prentice promises details of emissions policy." Available online at: http://www.calgaryherald.com/Business/Prentice+promises+details+emissions+policy/1529011/story.html. Accessed 12 May 2009

scheme. Starting in July 2007, Albertan facilities that emit more than 100,000 tonnes of greenhouse gases a year are required to reduce their emissions intensity by 12% under the Climate Change and Emissions Management Amendment Act. Companies have three ways to meet their reductions: they can make operating improvements; buy Alberta-based credits; or contribute to the Climate Change and Emissions Management Fund.[32]

China

In 2000 China was the 3nd largest greenhouse gas emitter in the world behind the United States and the EU (27), accounting for 4,771 Mt CO2-e or 12% of global emissions. Since then, China has overtaken the US as the world's largest emitter: the European Environment Agency estimated China's emissions were 14% higher than those of the United States in 2007.[33]

China's National Climate Change Program released in 2007 outlines steps China would take to address climate change. Strategies include increasing research and development; improving energy efficiency and building construction; developing renewable and nuclear energy; increasing forest cover, improving industrial policy and agriculture; and, improving institutions and policies. The current 11th Five-year Plan focuses on reducing energy intensity (energy per unit of GDP), with a target of 20% reduction within 5 years. China's renewable energy law which came into effect on 1 January 2006 aims to increase the share of renewable energy in the energy mix from one% (currently) to 15% by 2020. These measures are not equivalent to a Kyoto Protocol-style target .

Of China's 4 trillion yuan November 2008 economic stimulus package responding to the global financial crisis, approximately 1.5 trillion yuan targets green themes, including rail, water infrastructure, low emissions vehicles, and environmental improvement. However, the bulk of the package is devoted to infrastructure projects which will boost cement, steel and glass production, all major sources of China's emissions.

European Union

In 2000, the EU contributed approximately 12% to global emissions, or 4,894.7 Mt CO2-e, with Germany, the UK and France the largest emitting member states.[34] Under the Kyoto Protocol, the EU (comprising its then 15 member states) signed up to an eight% reduction target (i.e. 92% of 1990 level emissions) and with the use of flexibility mechanisms is likely to meet this target.

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[32] Alberta Government, "Climate Change and Emissions Management Act (2007)." Available online at: http://www.qp.gov.ab.ca/documents/Acts/C16P7.cfm?frm_isbn=9780779723386. Accessed on 7 July 2008.

[33] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 May 2009.

[34] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 May 2009

The EU considers that global warming must be limited to no more than 2oC from pre-industrial levels, and supports a global goal of 50% reductions from 1990 emissions by 2050, with developed countries contributing by reducing their emissions 60 to 80%.

The EU is committed to cutting EU emissions by 20% on 1990 levels by 2020 or 30% if comparable efforts are made by other developed countries. The Climate Action and Renewable Energy Package, agreed in December 2008, sets out the contribution expected from each Member State to meeting the EU target and proposes a series of measures to help achieve them: revising the European Union Greenhouse Gas Emission Trading Scheme (EU ETS), establishing emission reduction targets for non-ETS sectors (agriculture, building and transport), adopting an EU-wide renewable energy target (20% of energy to come from renewable energy sources by 2020), and increased demonstration of CCS projects.

On January 28 2009, the European Commission proposed 3.5 billion Euros for investment in CCS with 1.25 billion Euros assigned to the direct funding of eleven projects across the Union. The direct funding will focus on the coal fired power plants located in Germany, Poland, The Netherlands, Spain and the United Kingdom.

The EU Emissions Trading Scheme (EU ETS)

The EU ETS is a mandatory cap and trade emissions trading scheme covering 27 nations in the EU and around half of all EU emissions (approximately 10,000 installations in the energy and industrial sectors). The scheme commenced in 2005 and is now in second phase (2008-2012).

Revisions to the design of the scheme were agreed as part of the climate and energy package and will take effect in Phase III (2013-2020), including: expanded coverage to additional industrial sectors and aviation; phase out of free allocations to electricity generators; a higher level of permit auctioning; and increased limits on the use of Kyoto Protocol flexibility mechanisms.

France

In 2000 France's greenhouse gas emissions totalled 535.4 Mt CO2-e, comprising 1.3% of global emissions, making it the 14th largest emitter. France's CO2 emissions (not including land use, land use change and forestry) grew by around 8% between 1990 and 2005.[35]

France has one of the lowest CO_2 rates of any OECD nation, with up to seventy-eight% of its electricity coming from nuclear power.[36] France's target under the EU

[35] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 and 27 May 2009

[36] European Commission web site, "Renewable Energy Fact Sheet" (January 2008), EC Directorate-General for Energy and Transport. Available at: http://ec.europa.eu/energy/energy_policy/doc/factsheets/renewables/renewables_fr_en.pdf. Accessed on 7 July 2008.

'bubble agreement' is to limit emissions to 1990 levels over the 2008-2012 period. Based on latest projections, France's domestic emissions will be one percentage point over 1990 levels, so France is likely to purchase international credits to meet its target.

France has not announced a specific 2020 target as its contribution to the EU's collective 2020 target.

In addition to participating in the EU ETS, France's climate change policies include a target for an average reduction in energy intensity of its economy by 2% per year between 2005 and 2015 and 2.5% thereafter up to 2030. France has also set a long term target to reduce emissions by 75% on 1990 levels by 2050.[37]

In addition, France has a target to source 10% of its energy from renewable sources by 2010. This renewable energy policy is supported by a feed-in tariff mechanism for photovoltaic, hydro, biomass, sewage and landfill gas, municipal solid waste, geothermal and offshore and onshore wind, and by a tender system for large renewable projects.[38]

Germany

In 2000 Germany's emissions totalled 1006.4 Mt CO2-e and accounted for 2.5% of global emissions, making it the 9th largest emitter.[39] Between 1990 and 2005 Germany's CO2 emissions (not including LULUCF) decreased by 14.5%.[40] This drop in emissions is almost solely due to the collapse of East German industry after 1996.[41]

Under the EU's 'bubble arrangement' to meet its collective Kyoto Protocol target, Germany's target is to reduce its greenhouse gas emissions to 79% of 1990 levels by 2012. It is projected to achieve a further 2% below this target.

Germany has domestic targets to reduce its emissions (in addition to its role in the EU ETS) from 1990 levels by 40% by 2020 and 80% by 2050.[42]

On 13 February 2009, Germany's Ministry for the Environment, Nature Conservation and Nuclear Safety released 'New thinking – new energy', outlining the initiatives it needs to take to cut emissions by 40% below 1990 levels by 2020. These initiatives

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[37] French Law: Planning Act N° 2005-781 (13 July 2005).

[38] European Commission web site, "Renewable Energy Fact Sheet" (January 2008), EC Directorate-General for Energy and Transport. Available at: http://ec.europa.eu/energy/energy_policy/doc/factsheets/renewables/renewables_fr_en.pdf. Accessed on 7 July 2008.

[39] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 April and 27 May 2009

[40] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 and 27 May 2009

[41] German Watch. Available at: www.volker-quaschning.de. Accessed on 7 July 2008

[42] German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2008) Available at: http://www.bmu.de/english/climate/general_information/doc/4311.php. Accessed on 7 July 2008

focus on energy efficiency and increased renewable energy uptake. The document also outlines the conditions under which Germany expects it could meet its emissions targets beyond 2020, including: a global emissions trading scheme linked to the EU ETS; half of all coal-fired power plants fitted with CCS; a 30% cut in transport emissions against a 2005 baseline; a 21% cut in power consumption against a 2005 baseline; and a 50% share of renewable power in electricity production.

On 1 April 2009, the German Federal Cabinet adopted a draft act on CCS. The act is designed to grant operators of CCS plants the "necessary planning and investment security for pilot and demonstration plants."[43]

Germany was the key proponent of the International Renewable Energy Agency (IRENA), officially established in Bonn on 26 January 2009. To date, 78 countries have signed the IRENA Statute, including 28 African, 27 European, 16 Asian and 7 Latin-American countries. The Prime Minister announced Australia's intention to join IRENA on 17 May 2009.

India

In 2000 India's greenhouse gas emissions totalled 1,551.9 Mt CO2-e, comprising 3.8% of global emissions, making it the seventh largest emitter. India's CO2 emissions almost doubled between 1990 and 2005.[44]

As the second largest beneficiary of CDM projects, India considers hosting such projects to be the key role for developing countries in global mitigation efforts. However India has also implemented a range of policies focused on energy efficiency and increasing renewable energy including removing subsidies and promoting technology upgrades and fuel-efficiency.

India has set a renewable energy goal of 10% of new power generation capacity by 2010 and commenced a national hydropower initiative aimed at producing an additional 50,000 MW of hydropower by 2012. India has also introduced an afforestation policy which aims to increase forest and tree cover across the country from the existing 23% to 33% by 2012.[45]

India is a key member of the G77 and the 'G5' major developing countries (with China, Brazil, South Africa and Mexico) and is adamantly opposed to developing countries taking on binding international climate change mitigation obligations. India is prepared to make a commitment that its per capita emissions (currently under one

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[43] German Ministry for the Environment, Nature Conservation and Nuclear Safety, "Federal Cabinet Adopts CCS Act". Available online at: http://www.bmu.de/english/current_press_releases/pm/43681.php . Accessed on 15 May 2009

[44] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 and 27 May 2008.

[45] Institute of Global Environment and Society. "Asian Perspectives on Climate Regime Beyond 2012, Institute of Global Environment and Society" (2007). Available at: http://www.iges.or.jp/en/cp/report13.html. Accessed on 7 July 2008.

tonne CO2) would never rise above those of the developed world (approximately 11 tonnes CO2).

Indonesia

In 2000 Indonesia's emissions totalled 3066.3 Mt CO2-e and accounted for 7.5% of global emissions, making it the 4th largest emitter.[46] Deforestation is the largest source of emissions in Indonesia: excluding land use, land use change and forestry reduces Indonesia's total emissions to around 502 Mt CO2-e, representing 1.4% of global emissions. In 2000, Indonesia was the world's largest emitter from the land use change and forestry sectors (2,563 Mt CO2, 34% of global emissions from land use change and forestry). Indonesia's CO2 emissions (not including land use, land use change and forestry) grew by 133% between 1990 and 2005.[47]

On 29 May 2008 Indonesia announced a target to reduce energy sector emissions 17% below 2006. However the target is dependent on separate moves to shift the energy mix away from oil and on access to clean technologies.

Indonesia is a leader amongst developing countries on international efforts on reducing emissions from deforestation and forest degradation (REDD). Indonesia is working towards the development of a national regulation framework for activities on REDD, which will underpin how REDD activities in Indonesia are undertaken and financed. A growing number of REDD activities are already being funded in Indonesia by a range of donor organisations including countries, non government organisations and the private sector.

In June 2008 Prime Minister Rudd signed the Indonesia – Australia Forest Carbon Partnership, with President Yudhoyono, formalising Australia's cooperation with Indonesia on REDD. The Partnership includes development of the world's first large-scale REDD demonstration activity, the Kalimantan Forests and Climate Partnership.

At the Poznan Climate Change Conference in December 2008, Australia and Indonesia made a joint submission on REDD which was well received as a leading example of developing-developed country cooperation in UNFCCC negotiations.

Italy

In 2000, Italy's emissions totalled 531 Mt CO2-e and accounted for 1.3% of global emissions, making it the 15th largest emitter.[48] Italy's CO2 emissions (not including land use, land use change and forestry) grew by around 14% between 1990 and 2005.[49]

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[46] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 April and 27 May 2009

[47] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 April and 27 May 2009

[48] WRI CAIT. Available online at: http://cait.wri.org/cait.php. . Accessed on 7 April and 27 May 2009.

[49] WRI CAIT. Available online at: http://cait.wri.org/cait.php. . Accessed on 27 May 2009

Italy's target under the EU 'bubble agreement' is to reduce emissions by 6.5% on 1990 levels over the 2008-2012 period. Based on latest projections, Italy's domestic emissions will exceed its target by 14 percentage points, so Italy is likely to purchase international credits to meet its target.

Italy has not announced a specific 2020 target as its contribution to the EU's collective 2020 target. Within internal EU negotiations on its climate change and energy package Italy advocated strongly for a number of provisions to be weakened as a result of the global financial crisis.

As current G8 President, Italy chaired the G8 Environment Ministers Meeting in Sicily in April 2009, at which Australia was represented by the Minister for Agriculture, Fisheries and Forestry, Tony Burke. Italy will also host a Major Economies Forum meeting at leaders level in conjunction with the G8 Summit in L'Aquila, Italy, from 8-10 July.

Japan

In 2000, Japan was the world's 8th largest emitter of greenhouse gases, with emissions of 1,317 Mt CO2-e, approximately 3.2% of global emissions.[50]

Japan's emissions are currently 7.7 percent above 1990 levels. To meet its Kyoto target of a 6% reduction, Japan will need to reduce emissions by 14 percentage points over the next four years. Japan has introduced additional measures (see below) to reduce emissions to 0.8 1.8% below 1990 levels. The remaining 4.2 5.2 percentage points would be made up through carbon sinks and international credits.[51]

Examples of additional measures are the promotion of voluntary emissions reduction measures, improvement of energy-efficiency in homes, complete energy efficiency in factories and offices, improvement of fuel-efficiency in cars, promotion of emissions reduction measures in small-to-medium sized enterprises, and promotion of measures for alternative energy.

On 9 June 2008 former Prime Minister Fukuda announced a domestic emissions reduction target of between 60 and 80% on current levels by 2050. Current Prime Minister Taro Aso affirmed Japan's commitment to be a leader on climate change at a forum convened by the United Nations Secretary General in September 2008.[52] Japan is expected to announce mid-term emission reduction targets in mid 2009.

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[50] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 July 2008

[51] Point Carbon web site: "Japan cabinet formalises strengthened Kyoto programme". Available at: http://int.pointcarbon.com/Home/News/All%20news/Kyoto%20International/article27449-471.html. Accessed on 7 July 2008

[52] Japan Ministry of Foreign Affairs website, www.mofa.go.jp/POLICY/un/assembly2008/PM0925-2.html . Accessed on 27 March 2009

The Japanese Government continues to face domestic criticism that its climate change policies only cater to companies worried about additional costs.[53] With elections to take place in September 2009, pressure is mounting on the current Government to announce stronger targets after the main opposition party, the Democratic Party of Japan (DPJ) recently tabled a bill calling for cuts of 25% from 1990 levels by 2020 .

Former Prime Minister Fukuda announced in June 2008 the experimental introduction of an ETS with the inclusion of 'as many sectors and companies as possible'.

Japan has trialled emissions trading through a number of schemes, including J-VETS (introduced in 2005) and more recently a voluntary emissions trading scheme which began in October 2008 covering around 500 businesses. A number of regional schemes are also proposed, including by the Saitama Prefecture.

Republic of Korea

In 2000 the Republic of Korea's (ROK) greenhouse gas emissions totalled 511.2 Mt CO2-e, comprising 1.25% of global emissions, making it the 17th largest emitter. ROK's CO2 emissions have almost doubled between 1990 and 2005.[54] While ROK is not included in the UNFCCC's Annex I (developed country) grouping, as an OECD member, it is expected to take on more ambitious climate policies than most developing countries.

The ROK is showing an increased willingness to play a more prominent role in international climate change action, mostly as a result of the enthusiasm of President Lee Myung-bak. In September 2008, the ROK Government tabled a framework legislation package on climate change that includes provisions for an emissions trading scheme, greenhouse gas measurement and reporting, and foundations for boosting clean technology and renewable energy.[55] At that time, President Lee announced plans to invest approximately AUD94 billion over the next five years towards initiatives including clean coal, solar, fuel cell development and nuclear power. In January 2009, ROK announced a plan to increase the share of renewable energy to a projected 11% share of the energy mix by 2030. The ROK projects that energy-related emissions will peak in 2016.

In February 2009, President Lee established a Green Growth Commission to implement his national vision for "low carbon, green growth" and to advise on the potential introduction of a cap and trade scheme in 2013.

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[53] Reuters, 24 March 2009, "Japan election may bring tougher climate policies". Available online at: http://www.reuters.com/article/GCA-BusinessofGreen/idUSTRE52N24T20090324 . Accessed on 27 March 2009

[54] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 April and 27 May 2009

[55] Point Carbon (2 September 2008), "Korea Issues Emissions Trading Bill" http://www.pointcarbon.com/news/1.965517. Accessed on 2 September 2008

Korea signed up as a founding member of the Global Carbon Capture and Storage Institute (GCCSI) earlier this year.

Mexico

In 2000 Mexico's greenhouse gas emissions totalled 670.8 Mt CO2-e, comprising 1.6% of global emissions, making it the 12th largest emitter. Mexico's CO2 emissions grew by around 35% between 1990 and 2005.[56] While Mexico is not included in the UNFCCC's Annex I (developed country) grouping, as an OECD member it is expected to take on more ambitious climate policies than most developing countries.

Mexico has recently taken a number of notable steps forward on climate change. Mexico has committed to implementing specific activities under its National Climate Change Strategy and Special Climate Change Program, including an Inter-American Development Bank financed national study on the economic impact of climate change (based on the Stern Review methodology), measures to mitigate that impact, and climate change action plans in more than 10 states in Mexico.

In December 2008, Mexico announced it aims to cut emissions by 50% on 2002 levels by 2050, making it one of the first developing countries to commit to a long-term target. Mexico's 2009 'Special Program on Climate Change' also includes a goal of reducing its emissions by 99 Mt CO2-e by 2012.

Recent media reports indicate that Mexico is also considering implementing a domestic cap-and-trade system.

Russia

In 2000 Russia's greenhouse gas emissions totalled 1959.7 Mt CO2-e: 4.8% of global emissions, making it the 6th largest emitter. Russia's CO2 emissions (not including land use, land use change and forestry) decreased by around 30% between 1990 and 2005.[57] Russia's emissions fell dramatically with the economic collapse of the early 1990s, however emissions have been on an upward trend since 2000. Russia has a strong interest in the Kyoto Protocol's 'Joint Implementation' mechanism, under which it can sell its excess Kyoto credits to other developed countries which will fall short of their Kyoto targets.

Russia's domestic climate change policy is largely centred on the energy efficiency elements of its National Energy Strategy which was approved in August 2003. The Energy Strategy document outlines several main priorities: an increase in energy efficiency and in renewable energy, reduced impact on the environment, technological development, as well as an improved effectiveness and competitiveness.[58]

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[56] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 27 May 2009

[57] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 April and 27 May 2009

[58] IEA Climate Change Policies and Measures Database. Available online at: http://www.iea.org/textbase/pm/index_clim.html. Accessed on 7 July 2008

In June 2008, Russian President Dmitry Medvedev announced the Government had approved funding for energy efficiency projects and renewable energy and raised the possibility of regulations from 2010 aiming at reducing consumption of natural gas in household heating. Medvedev indicated efforts to boost energy efficiency could cut energy intensity in households and industry by 40-50% but without specifying a time period.[59] Russia is also reportedly considering tax incentives for the development of low-emission fossil fuel technology, and the removal of barriers to the development of renewable energy.[60]

Although Russia has not announced a 2020 target, it is likely to argue strongly for conditions in a post-2012 outcome that would ensure it continues to benefit from the emissions reductions that resulted following its economic collapse in the 1990s – for example, continuation of 1990 or a similarly advantageous (ie – early) base year, and 'banking' of credits for use in future commitment periods.

South Africa

In 2000 South Africa's greenhouse gas emissions were 385.3 Mt CO2-e, accounting for 0.94% of global emissions and making South Africa the world's 23rd largest emitter.[61]

As a developing country, South Africa has emphasised that sustainable development (including the creation of employment, alleviation of poverty and provision of housing) sets the context for its climate change policy response. It argues that mitigation efforts of developing countries will depend on international funding and technology support.[62]

In June 2008 South Africa released Long-Term Mitigation Scenarios (LTMS) identifying scenarios for mitigation of climate change in South Africa. This document recognises that South Africa is a high per-capita emitter with relatively high emissions intensity figures. On a "business as usual scenario", South Africa's emissions grow from 440 Mt CO2-e in 2003 to around 1600 Mt CO2-e by 2050.

The LTMS is considered as laying the foundation for the development of a comprehensive national climate change policy. The policy is expected to be finalised

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[59] Point Carbon (5 June 2008), "Russia should play full role in post-2012 talks: senior MP." Available online at: http://www.pointcarbon.com/news/1.932057 (subscription required). Accessed on 7 July 2008

[60] Point Carbon (5 June 2008), "Russia should play full role in post-2012 talks: senior MP." Available online at: http://www.pointcarbon.com/news/1.932057 (subscription required). Accessed on 7 July 2008

[61] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 April 2009

[62] South African Department of Environmental Affairs and Tourism (DEAT) "A National Climate Change Response Strategy for South Africa", September 2004. Available at: www.environment.gov.za/Documents/Documents/2004Oct7/Climate%20change%20response%20strategy%2010Sept04.doc. Last accessed 27 March 2009

in late 2010 and would reflect any post 2012 commitments adopted by South Africa resulting from COP15 in December 2009.

In July 2008 the South African Cabinet announced a "peak, plateau and decline" policy where greenhouse gas emissions stop growing by 2020-2025, stabilise for up to ten years and then decline in absolute terms. To achieve these mitigation objectives, the Government plans to implement a number of measures including:

- accelerated energy efficiency (including mandatory targets) and conservation measures across all sectors of the economy;
- research and development funding focusing on carbon-friendly technologies;
- increasing the price of carbon through an escalating CO2 tax or an alternative market mechanism;
- diversifying the energy mix away from coal and at the same time shifting to cleaner coal;
- setting targets for electricity generated from both renewable and nuclear energy sources; and
- exploring and developing carbon capture and storage (CCS) for coal fired power stations and coal-to-liquid plants.[63]

The next step in South Africa's policy development process is the publication of a draft policy document in the form of a green paper in April 2010.

United Kingdom

In 2000 the UK's greenhouse gas emissions were 632.2 Mt CO2-e. This comprised 1.6% of global emissions, making the UK the world's 13th largest emitter. The UK has reduced its greenhouse gas emissions since 1990, with CO2 emissions (not including LULUCF) falling by 5% between 1990 and 2005.[64] This reduction has mainly been driven by restructuring, especially in the energy supply industry (national coal production virtually ceased and was predominantly replaced by energy produced from gas); energy efficiency; pollution control measures in the industrial sector and other policies that reduced emissions of non-CO2 greenhouse gases.

On latest projections, UK emissions will be 7 percentage points below its Kyoto Protocol "EU bubble" target of 87.5% of 1990 levels.

In October 2008 the UK announced a domestic commitment to reduce emissions by 80% on 1990 levels by 2050. Further to this, on 20 April 2009 the UK released a mid-

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[63] South African Department of Environmental Affairs and Tourism (DEAT), "2009 Climate Change Summit Statement". Available at: http://www.ccsummit2009.co.za/Downloads/Media/2009.03.06_Climate_Change_Summit_2009_Statement.pdf Accessed on 9 March 2009

[64] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 July 2008

term emissions reduction target of 34% below 1990 levels by 2020. The UK has indicated that reductions are to be made at home and has also suggested that it will toughen targets once a global agreement is in place.

The key piece of UK legislation on climate change is the UK Climate Change Act 2008. The Act mandates the emissions reduction targets listed above through a carbon budgeting system, which caps emissions over five year periods all the way until 2050.[65] The UK intends to publish an energy and climate strategy by September 2009 which will set out policies on how the limits will be met for each of the five-year carbon budget periods.

The Climate Change Act allows the UK to meet its carbon budgets through the purchase of carbon credits corresponding to overseas emissions reductions. The UK aims to meet the first three carbon budgets without purchase of overseas credits outside of the EU ETS, reserving possible credit purchase as a fallback option. In the 2009 Budget,[66] the UK announced over £1.4bn additional support for low-carbon sectors. Key elements are:

- £375 million to support energy and resource efficiency in businesses, public buildings and households over the next two years, and £70 million for decentralised small-scale and community low-carbon energy
- £405 million to support low-carbon industries and advanced green manufacturing
- £525 million support to offshore wind through reform of the Renewables Obligation. This is expected to support £9 billion of investment and power up to 2.8 million homes
- extending support for combined heat and power through climate change levy exemptions, helping bring forward £2.5 billion of investment, and 3 GW of capacity by 2015
- a new funding mechanism to support up to four carbon capture and storage demonstration projects, and £90 million to fund detailed preparatory studies.

On 23 April 2009, the UK announced that future coal-fired power stations would only be built if fitted with CCS demonstration technology. Within five years of CCS technology being independently judged as technically and commercially feasible, all coal- fired power stations are to be retrofitted with the technology.[67]

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[65] DECC web site: http://www.decc.gov.uk/en/content/cms/legislation/en/content/cms/legislation/cc_act_08/cc_act_08.aspx. Accessed on 15 May 2009

[66] HM Treasury website: http://www.hm-treasury.gov.uk/d/Budget2009/bud09_completereport_2520.pdf . Last accessed on 18 May 2009

[67] DECC web site: http://www.decc.gov.uk/en/content/cms/news/pn050/pn050.aspx . Accessed on 15 May 2009

The UK has a range of climate change initiatives implemented over the last decade to contribute to achieving their emissions reduction targets. Key measures include the climate change levy, emissions trading (as part of the EU), and a carbon reduction commitment.

The Climate Change Levy is a tax on the use of non-renewable energy in industry, commerce and the public sector. Climate Change Agreements have been made with energy intensive industries (such as aluminium and paper manufacturing) allowing them an 80% discount from the levy in exchange for adopting targets for improving their energy efficiency or reducing carbon emissions.[68]

The UK Emissions Trading Scheme, which commenced in 2002, was the world's first economy wide greenhouse gas emissions trading scheme. This scheme ended in December 2006 and the UK now participates in the EU ETS.[69]

The Carbon Reduction Commitment aims to create incentives for significant carbon abatement in non energy intensive sectors, such as large commercial and public sector organisations, that are not covered by the EU ETS or Climate Change Agreements. An introductory phase is due to start in January 2010.[70]

UK power transmission network operator, National Grid, recently pledged an emissions reductions target of 45% by 2020, with carbon budgets implemented across all National Grid operations from 1 April 2009. National Grid's efforts are designed to help the UK reach its 80% reduction target by 2050 and 15% renewable energy target by 2020.

United States

The US is officially the world's largest emitter of greenhouse gases, though recent reports (see above) indicate that China has now overtaken the US. US greenhouse gas emissions in 2000 were 6,442.8 Mt CO2-e, comprising approximately 16% of global emissions. Between 1990 and 2005 US CO2 emissions (not including land use, land use change and forestry) grew by 20%.[71]

President Obama has made climate change a priority for his Administration - the President's 'New Energy for America' plan includes the following elements:

- implement an economy wide cap and trade system;

[68] DEFRA web site: http://www.defra.gov.uk/environment/climatechange/uk/business/cca/levy.htm . Accessed on 15 May 2009

[69] DEFRA web site: http://www.defra.gov.uk/environment/climatechange/trading/index.htm. Accessed on 15 May 2009

[70] DECC web site: http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/crc/crc.aspx. Accessed on 15 May 2009

[71] WRI CAIT. Available online at: http://cait.wri.org/cait.php. Accessed on 7 April and 27 May 2008

- fund the development and demonstration of a smart grid (energy transmission) technologies;
- create 5 million new jobs by investing USD150 billion over the next 10 years on clean energy research, development and demonstration, including promoting energy efficiency, home insulation for 1 million homes annually, and clean coal technologies;
- USD3.4 billion for low-carbon emission coal power and industrial processes;
- establish a National Low Carbon Fuel Standard, and a new USD7,000 tax credit for purchasing advanced vehicles; and
- put 1 million plug-in hybrid cars on the road by 2015.

The cap-and-trade system outlined in the plan is to reduce carbon emissions by about 14% below 2005 levels by 2020 and 83% below 2005 levels by 2050 (equivalent to returning emissions to 1990 levels by 2020 and 80% below 1990 levels by 2050).

On 31 March 2009, the draft American Clean Energy and Security Act of 2009 (the Waxman-Markey Bill) was released for discussion by Henry Waxman, Chairman of the House Energy and Commerce Committee and Edward Markey, Chairman of the Subcommittee on Energy and the Environment. On 21 May 2009 the House Energy and Commerce Committee voted 33-25 to approve a revised version of the Waxman-Markey Bill (HR2454, the American Clean Energy and Security Act of 2009).

The Waxman-Markey Bill proposes a suite of measures to promote clean energy, improve energy efficiency, reduce greenhouse gas pollution (including through the introduction of 'cap and trade' emissions trading scheme) and support the transition to a clean energy economy.

The headline target for the draft Bill is US economy-wide emission reductions of 20% on 2005 levels by 2020 (equivalent to a 8% reduction on 1990 levels). In addition, the draft Bill proposes supplemental reductions of 10% of 2005 emissions through reducing deforestation and preventing illegal logging in developing countries. This is funded from revenue from auctioning permits. With these supplemental reductions, the economy-wide goal is equivalent to a 19% cut on 1990 levels.

On 19 May President Obama announced a new national policy aimed at both increasing fuel economy and reducing greenhouse gas pollution for all new cars and trucks sold in the US in 2012-2016 (requiring a 35.5 mpg average in 2016).

State-based ETS

There are three multi-state emissions trading schemes currently under development in the US, which cover approximately 155 million citizens or just over half of the US population. California also has a well-developed ETS plan.

The Western Climate Initiative (WCI) includes seven US states: Arizona, California, Montana, New Mexico, Oregon, Utah, and Washington (approximately 59 million

citizens); and four Canadian provinces (British Columbia, Manitoba, Quebec and Ontario), with a goal of reducing emissions by 15% on 2005 levels by 2020 (approximately 33% below business as usual levels). The WCI's design for a cap and trade program was released on 23 September 2008. The design recommends a base program covering all six greenhouse gasses emitted from the electricity sector, large stationary combustion sources, industrial process and waste management emissions, and fossil fuel production and processing.[72]

The Regional Greenhouse Gas Initiative (RGGI) includes ten US states: Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, Vermont, Massachusetts, Rhode Island and Maryland (approximately 57 million citizens).[73] Under the RGGI, an emission cap is set at current levels in 2009, and then reduced 10% by 2019. The emission trading scheme is initially restricted to CO2 emitted from power stations. The scheme commenced in January 2009 and three permit auctions have been held (1 September 2008, 17 December 2008 and 18 March 2009). The next auction is scheduled for 17 June 2009. RGGI participants will be allowed to use international offsets once a threshold price has been reached.

The Midwestern Greenhouse Gas Accord includes six US states: Illinois, Iowa, Kansas, Michigan, Minnesota and Wisconsin (approximately 39 million citizens); and the Canadian province of Manitoba. The Accord was agreed in November 2007 and will establish reduction targets and a multi-sector cap and trade system, although no specific targets or design elements have been released.[74] Work is continuing on finalising targets for reducing emissions, and the design of the scheme.

California is committed to bringing down emissions to 1990 levels by 2020 (at least a 25% reduction below BAU) and to 80% of 1990 levels in 2050. Plans for an ETS were released on 27 June 2008, and the scheme is due to commence in 2012. It will cover all six Kyoto Protocol greenhouse gases and initially include power generators and oil refineries.[75]

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[72] Western Climate Initiative web site, "Design Recommendations on Elements of the Cap and Trade Program" (September 2008). Available at: http://www.westernclimateinitiative.org/ewebeditpro/items/O104F21253.PDF. Accessed on 27 March 2009

[73] Regional Greenhouse Gas Imitative web site, "Design Elements for Regional Allowance Auctions under the Regional Greenhouse Gas Initiative" (March 2008). Available at: http://www.rggi.org/docs/20080317auction_design.pdf. Accessed on 7 July 2008

[74] Midwestern Greenhouse Gas Accord web site, "Governors Sign Energy Security and Climate Stewardship Platform" (November 2007). Available at: http://www.midwesterngovernors.org/govenergynov.htm. Accessed on 7 July 2008

[75] California Environmental Protection Agency web site, "Climate Change Draft Scoping Plan" (June 2008). Available at: http://www.arb.ca.gov/cc/scopingplan/document/draftscopingplan.pdf. Accessed on 7 July 2008

ADDITIONAL COMMENTS AND QUALIFICATIONS

SENATOR MICHAELIA CASH

Introduction

The evidence presented to the Committee during this Inquiry, both in written and oral form, confirms that there is significant conflicting scientific evidence about the cause and extent of climate change. Despite this conflict, I subscribe to the position articulated by Rupert Murdoch that when it comes to carbon dioxide emissions "the planet deserves the benefit of the doubt".

However, the only action that should be taken by a Government to reduce carbon emissions is responsible action. Action taken at the expense or detriment of the Australian people should not be supported.

The Government's current Carbon Pollution Reduction Scheme (CPRS) if agreed to in its present form, will result in action being taken at the expense of the Australian people. But worse than that, its implementation in its present form is likely to achieve the perverse outcome of Australia contributing to an increase in global emissions.

The CPRS manifestly fails to achieve the Government's stated objectives of reducing emissions while protecting jobs.

As the Governments central policy to reduce Australia's carbon pollution, the CPRS patently fails to:

1. reduce carbon pollution at the lowest economic cost;

2. put in place long-term incentives for investment in clean energy and low emission technology, and

3. contribute to a global solution to climate change.

With the recent unemployment statistics confirming an increase in unemployment in Australia, the fact that there has been an increase of nearly 200,000 Australians out of work since August 2008 and the Government's continued predictions that unemployment will continue to rise, it is imperative that every element of Government policy should be focussed on effective measures which will ensure that employment in Australia remains consistently high – not measures that will result in job losses.

The evidence given to this Inquiry confirms that the CPRS is both a badly designed scheme and seriously flawed. It should not be supported.

I support Committee Recommendation 2 which states:

> The Committee recommends that the CPRS legislation not be passed in its current form.

1. Qualification—Chapter 2—Analysis of scientific views

I reject the analysis of, and the conclusions drawn in relation to, the climate science as set out in Chapter 2 of the Majority Report paragraphs 2.1 to 2.32 and paragraph 2.36.

There was a considerably wide diversity of views on the subject of climate science - in particular the cause and extent of climate change and the extent, if any, to which climate change is a consequence of anthropogenic behaviour.

This diversity of views was reflected in the evidence given by witnesses both in submissions to the inquiry and in evidence at the hearings.

In the analysis of evidence in Chapter 2 of the Majority Report, significant analysis is given to scientists who provided evidence endorsing the findings of the IPCC 2007 Report, that warming of the climate system is unequivocal and that the increase in global average temperature since the mid 20th century is due to anthropogenic greenhouse gas concentrations.

I do not believe that the same depth of analysis was given to those scientists and other experts who do not agree with this view and gave evidence that climate change was due to natural causes and was not the result of anthropogenic behaviour.

In terms of the comment expressed at Chapter 2, paragraph 2.20 of the Report that:

> The bulk of the thousands of submissions which the committee received from the public accept that climate change is happening and urge action.

What the report fails to mention is that the majority of these submissions were in the nature of a 'pro forma' submission generated from the websites of environmental groups and should be considered in that context.

I disagree with the conclusion expressed on behalf of the Committee at paragraph 2.37 that:

> The balance of the evidence discussed above suggests that climate change is occurring, is driven by anthropogenic factors and is a grave threat to accustomed ways of life and natural systems. If this view is right, the calculations above make a virtually unarguable case for taking global action.

I do not believe that this properly reflects the balance of evidence in terms of the science of climate change.

I affirm my view that whilst the planet should be given the benefit of the doubt, the only action that should be taken by a Government to reduce carbon emissions is responsible action. Action taken at the expense or detriment of the Australian people should not be supported.

2. Treasury Modelling

2.1 Failure to model effect of current CPRS on jobs and the environment

Climate change is best tackled from a position of economic strength. To effectively meet the huge cost of tackling greenhouse gas abatement requires:

- Australians in jobs;
- business performing strongly; and
- a robust economy.

The Committee received extensive evidence raising serious concerns about the modelling undertaken by the Treasury. This evidence also identified significant flaws in Treasury's modelling as set out in Chapter 2 of the Majority Report.

Despite the significant concerns expressed by witnesses, Treasury failed to produce any economic modelling justifying its claims on the likely effect of the CPRS upon jobs and the environment.

I have formed the view, based on evidence provided to the Committee that the modelling undertaken by the Treasury is both deficient and inadequate and Treasury must undertake further modelling as articulated in the Majority Report.

2.2 Lack of peer review and transparency

Accountability and openness in government require that those who exercise power while performing the functions of government, demonstrate in an open and practical sense that they are doing so with honesty, integrity, appropriate skill and judgment, and have discharged their duty in a proper manner for the common good and in the public interest.

Those who are entrusted with public power are required, when called upon, to justify the use of that power.

The use of commercial-in-confidence claims as a shield to avoid proper scrutiny of Government actions has the potential to seriously threaten accountability and openness in government.

I refer to Recommendation 7 of the Senate Select Committee on Fuel and Energy's Interim Report tabled in the Senate in May 2009 which notes the failure of the Government to provide this information and its failure to comply with the Order of the Senate of 11 March 2009 to release all of the information currently being kept secret.

I am concerned at the Government's continued refusal to provide access to all of the model codes and databases used in the Treasury modelling.

3. Impact on Western Australia

3.1 Loss of jobs

Western Australia is a major contributor to the Australian economy and in 2007–08 contributed approximately $8.2 billion to the Commonwealth in net terms.

As a Senator for Western Australia I am concerned about the potential disastrous impact of the CPRS on the Western Australian economy.

An Access Economics Report commissioned by the State Premiers and published in June 2009, confirms that the Government's Emissions Trading Scheme would cost 13,000 jobs in WA alone.

These 13,000 jobs will in the main come from the following industries, black coal, oil and gas, petroleum and coal products, chemical rubber and plastics, iron steel and metals, electricity and the gas distribution sector.

3.2 Flaws in Treasury Modelling

I am concerned at claims that the Treasury modelling in respect of the assessment of the need for Electricity Sector Adjustment Scheme (ESAS) assistance uses the same competitive spot market assumptions made for the Eastern States Electricity Market in its assessment of this need in Western Australia.

In other words Treasury failed to recognise the differences in the Western Australian electricity market. This failure to distinguish between the respective models results in a detrimental impact on Western Australia.

As noted in the Coalition Senators Dissenting Report of the Senate Economic Committee Inquiry into the Exposure Drafts of the Legislation to Implement the Carbon Pollution Reduction Scheme tabled in the Senate in April 2009:

> Griffin Energy, in their submission to the inquiry into the exposure draft of the CPRS, made the point that the Western Australian Electricity Market, in which gas power generation is dominant, suffers discrimination because the Treasury modelling uses the same competitive spot market assumptions made for the Eastern States Electricity Market in its assessment of the need for ESAS assistance.
>
> In fact however the WA Electricity Market is very different to that of the Eastern States Electricity Market in that WA has a high dependency for electricity generation on gas from the North West Shelf being carried to the South West in the Dampier to Bunbury pipeline, and this will continue to be the case even if renewable replace coal.
>
> Griffin Energy point out that there is a historic price competition between gas and black coal in the Western Electricity Market and state that WA's long term security of supply will likely be compromised by the current CPRS settings.

> Griffin points out that the so call National (i.e. Eastern States) Electricity Market is based on a competitive spot market into which all generators supply electricity whereas the Western Electricity Market is based on bilateral contracts.
>
> In the selling model the price of electricity is locked in for the length of contracts and there is no capacity in the Western Electricity Market to pass through to consumers the increasing price of carbon which the generators will bear over 15 years. By contrast in the National Electricity Market Model, based on competitive spot prices, the additional cost of carbon over 15 years will be passed through via the market clearing price.
>
> Griffin states that the Western Australian Electricity Market requires a separate ESAS formula with an emissions intensity cut off limit of 0.75tCO2e.

The flaws in the Treasury assessment of ESAS assistance was further confirmed in evidence to this Inquiry as noted at paragraphs 4.157 of the Majority Report as follows:

> The CPRS is also fundamentally flawed in that it fails to take into account the special circumstances of Western Australia. The rest of the country is part of an integrated national electricity market (NEM) whereas Western Australia is isolated and reliant on a small number of gas suppliers. This means much of the Treasury analysis assuming pass-through of higher costs is inapplicable to the WA market.

This failure of Treasury to distinguish between the respective models needs to be rectified in any future modelling.

4. Renewable Energy Target

I note the announcement of the Government on Tuesday 9 June 2009, coupling the renewable energy target with the emissions trading scheme.

The vision of solar, geothermal, tidal, wind and wave power is an exciting prospect for Australia and should be encouraged by government. It is disappointing that the Government appears to be deliberately sabotaging its own legislation at the expense of these emerging Australian industries and the jobs that would go with them.

This is yet another example of how the Rudd Government is intent on 'going it alone' on climate policy in this country, despite the impact it will have on Australian jobs and the real economy.

5. Agriculture and Land use

I note paragraphs 6.9 to 6.11 of the Majority Report.

> A common theme from all submitters and witnesses who discussed agriculture and land use issues was the historical adaptability of Australian farmers, and many called for policies that will harness and foster the independence and ingenuity of the agricultural sector. This confidence in

> the capacity of the agricultural sector to embrace and drive change is shared by all members of the committee.
>
> A consistent view from agriculture-related organisations, as well as environmental and other stakeholders, was that under the current and proposed policy settings in Australia the agricultural sector could not access the opportunities offered by climate change abatement and mitigation activities, such as the new income streams that could be opened up by renewable energy, soil carbon and avoiding deforestation.
>
> The potentially negative impact of climate change policies on agricultural sector production and incomes was also explored in some detail throughout the hearings.

The Government should provide adequate incentives for the adaptation and innovation needed for farmers to actively undertake and promote changes to farming practices that encourage emission reduction. The failure of the Government to provide such incentive may put unacceptable pressure on costs of food production and jeopardise Australia's global competitiveness.

6. Conclusion

The evidence indicates that it is apparent to all serious policy makers that there is no unilateral Australian solution to climate change, only a global solution.

The Institute of Public Affairs gave the following evidence to the Senate Standing Committee on Economics during its Inquiry into the Exposure Draft of the Legislation to implement the Carbon Pollution Reduction Scheme:

> …With only 1% of world GDP, we are neither prominent among world nations nor particularly influential within world councils. And while Australia has many well qualified scientists, few of these are considered to be world authorities on climate change. Accordingly, it is pure hubris for Australia to attempt to take the lead in abatement activity.

In light of the fact that the Copenhagen conference is only six months away, and the Obama Administration and the US Congress are well advanced in finalising US legislation for an emissions trading scheme, it would be premature to lock Australia into an ETS that is out of step with the rest of the world.

The CPRS is a flawed scheme. The scheme puts Australian industries and the jobs that go with them, at great risk for little or no environmental gain.

Senator Michaelia Cash
LP, Western Australia

Minority report by the Australian Greens

1.1 This important committee was established as a result of collaboration between the Coalition and the Greens with a view to receiving evidence about climate science for the first time. It also received evidence pertaining to measures complementary to the CPRS and on the CPRS itself. There was an overwhelming public response to the inquiry with over 8,000 submissions received. The great majority supported far stronger action on climate action than the Government is proposing with the CPRS.

1.2 Given that the Coalition and the Greens have diametrically opposed views about the urgency of addressing climate change and the extent of the greenhouse gas emissions cuts required to address this imperative it is not surprising that there is not a consensus report from this Committee.

1.3 Nonetheless, there were some areas of agreement, for sometimes very different reasons, including the most fundamental recommendation, which is that the CPRS not be supported in its current form.

1.4 The Greens had hoped that this inquiry would persuade government and non-government Senators about the scale and urgency of the climate change emergency. After describing the evidence (albeit downplayed) about the significant likelihood that the global emission reduction goals will be too weak to prevent dangerous climate change and that, without urgent political leadership, agreement to achieve those weak goals won't be achieved, the sole recommendation from the Committee is that the Government should once again review the cost of reducing emissions. This is, frankly, an extraordinary failure of comprehension and leadership. Therefore the Greens make this key recommendation:

Recommendation 1

1.5 Australia must enter the climate treaty negotiations at the end of 2009 with an unconditional commitment to reduce emissions by at least 25 per cent below 1990 levels by 2020 and a willingness to reduce emissions by 40 per cent in the context of a global treaty.

1.6 The main areas where the position of the Greens differs from the views expressed in the Chair's Committee Report are as follows:

Climate Science and Emission Targets

1.7 The Report's representation of scientific evidence presented to the Committee downplays the extent of the evidence suggesting that stabilising greenhouse gas concentrations at 450 ppm (the most ambitious objective being considered by the Government) would leave a high risk of dangerous climate change.

1.8 For example, Dr James Risbey (from Research and CSIRO Marine and Atmospheric Research but giving evidence in a private capacity) said:

> ...you will find that many of us feel that 450 parts per million is too high, that that does expose us to dangerous climate change. Essentially, it sets us up for a different climate system well outside the climate system that we adapted to as a civilisation. ..there is really no such thing as a safe target, but a safer target would be something that would be closer to 350 parts per million, because that would reduce the risk of exceeding two degrees Celsius to more moderate levels, so back down to the 10 or 20 per cent levels rather than the 50 to 90 per cent levels.. That is technically possible, but it would require targets much more stringent than those in the CPRS. The targets for 2020, instead of being in the five to 15 mark, would be nearer the 40 per cent mark, and for 2050 it means essentially 100 per cent reductions, so we need to be more or less carbon neutral in order to attain these targets with more moderate risks.[1]

1.9 In addition to the scientific evidence, the Report does acknowledge that the Committee also heard that the ethical and moral imperative to respond to the risk of climate change was overwhelming. Further, the Report acknowledges analysis from both the *Stern Review* and the *Garnaut Review* highlight that the cost of taking action to reduce greenhouse gas emissions far exceeds the cost of inaction. Despite this, however, the Committee failed to make the logical and consequential recommendation about the need for more ambitious global greenhouse gas abatement targets.

1.10 The question of what would be a fair and equitable contribution by Australia to the global greenhouse gas abatement challenge also received inadequate discussion in the Report. The Government's Carbon Pollution Reduction Scheme is premised on a burden sharing proposition that is both inequitable and unfair and as such will not be acceptable to other nations.

1.11 There are a range of 'metrics' that could be used to determine fair burden sharing between nations. The Australian Government, owing to its policies to expand the economy by promoting population growth (including through high levels of skilled migration), favours metrics such as comparable per capita emission reductions. Other nations, particularly those with stable populations, are likely to argue for burden sharing to recognise other metrics such as historical responsibility, comparable effort in terms of cost of emission abatement cost and/or abatement effort since 1990. If the case for these metrics is successfully argued during the climate treaty negotiations at the end of this year Australia will be obliged to accept more ambitious emission targets. By pre-empting the climate treaty negotiations by locking in a weak heavily conditional upper target into legislation the Australian Government undermines the treaty process.

1.12 The government has declined to specify the metrics that it used to arrive at the 25 per cent conditional upper limit and it is apparent that the target has been derived from a political decision rather than a calculation based on a principled combination of metrics. This means that in Copenhagen the Government will only agree to burden-sharing metrics which, when applied, result in Australia committing to its pre-determined position.

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1 Dr James Risbey, *Proof Committee Hansard*, 23 April 2009, pp 58-9.

Compensation for Emission Intensive Trade Exposed Industries

1.13 While many companies argued for generous compensation alleging that the CPRS would unfairly impact their competitiveness, no evidence was presented to undermine the assessment of the *Garnaut Review* that the industry assistance package should only compensate the emission intensive trade exposed industries for costs resulting from the fact that some trading partners have not yet introduced carbon pricing policies and that it should not seek to compensate merely to maintain profitability. The Government's proposed EITE compensation package fails this test and is little more than an attempt to buy-off dissenting large polluters.

Green jobs

1.14 The Report gives just two paragraphs to the question of Green Jobs (ie jobs created as a result of the transition to a low carbon economy). This demonstrates a studied ignorance of the number of jobs that will need to be created in an economy wide restructure.

1.15 Critics of the CPRS like to add up claimed job losses at individual firms (which can be easily identified) and ignore those jobs (harder to identify) generated in green industries, by households spending the additional assistance payments and by firms made more competitive by the likely exchange rate depreciation.

1.16 The capacity of the labour market to handle structural change appears to be underappreciated by these critics. In the decade to November 2007, employment in rural industries dropped by almost 100,000; employment in manufacturing dropped by almost 50,000 and employment in wholesale trade dropped by 35,000. Yet over this period the unemployment rate fell from 8½ per cent to 4 per cent.

1.17 The amount of natural turnover in labour markets is also often underappreciated. It is very high even in years when the economy is booming. For example, over a million workers employed in February 2005 were no longer with the same employer a year later, and over half of these changed industry. This illustrates that the process of shifting employment from contracting to growing industries can occur with far fewer additional layoffs than might be imagined from a simple comparison of employment levels in a subsidised industry before and after the removal of a subsidy. (For example, if 1,000 jobs are lost in an industry, it does not necessarily mean that 1,000 workers are dismissed. It may just mean that of 3,000 who choose to leave, only 2,000 are replaced.)

1.18 Many witnesses without ties to existing companies spoke of the potential for growth in green jobs:

> …there are very significant opportunities for enterprise and employment, provided a signal is sent to assure people who might be prepared to make those investments and take people on—that there is a future for them. I do think there is going to be a transition, and I do think there is going to be

> some time where communities go through some changes, but there have to be huge chances for employment.[2]
>
> I think the Clean Energy Council estimated that around 50,000 jobs were required just for the 20 per cent renewable energy target.[3]
>
> The model actually has rapid growth in green jobs…[4]

Complementary measures

1.19 The Greens welcome the fact that the Committee agreed that policy measures complementary to the CPRS were important to address a range of market failures, but disagree with the view that further consideration of such measures should be delayed until after the start of the CPRS. While it is true that there are a number of existing ad-hoc programs at Commonwealth and State and Territory level, there is clearly an imperative for the Commonwealth to introduce stronger policies to drive the rapid uptake of existing renewable energy, energy efficiency, upgrades to the electricity grid, the roll-out of public transport, and to support the research, development and commercialisation of emerging technologies.

1.20 Evidence was given to the committee that if the Commonwealth introduced a national 'gross' feed-in tariff for a range of renewable energy technologies, this would automatically supersede several existing ad-hoc and weak State based feed-in laws, as well as a number of weak Commonwealth programs. Contrary to the Committee view, given the urgency with which we must reduce emissions, there is no case to delay introducing complementary measures. The Commonwealth needs to take a leadership role – indeed the State Governments would welcome it.

Carbon capture and storage

1.21 The Greens do not agree with the view expressed as the 'Committee View' 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."

1.22 The Greens disagree that many of these technologies are promising. Rather, evidence presented to the Committee indicated that the prospects of carbon capture and storage technology ever competing with alternative low or zero emission energy generation options is low. For this reason we believe that the private sector should take on the risk of "further research and development in this area". In addition, we do

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2 Mr Tony Westmore, *Senate Standing Committee on Economics, Proof Committee Hansard*, 23 March 2009, p. 24.

3 Dr Ottaviano, Carnegie Corporation, *Senate Standing Committee on Economics, Proof Committee Hansard*, 23 March 2009, p. 33.

4 Mr Danny Price, *Proof Fuel and Energy Select Committee Hansard*, 2 April 2009, p. 18.

not support liability for leakage from carbon dioxide storage sites being transferred to the tax-payer.

Agriculture and land use

1.23 The Greens disagree with the Committee view that tree plantations should be able to generate emission credits under the CPRS, and are instead persuaded by the evidence presented by witnesses such as the Dr Judith Ajani and the Tasmanian Farmers and Graziers Association that this would distort land-use decisions. The Greens support a more regulated approach to funding bio-sequestration to take into account issues such as competition for water and food producing land and biodiversity conservation.

1.24 It should also be emphasised that the trees versus food/water and biodiversity distortion is aggravated by the fact that the carbon accounting rules under the Kyoto Protocol ignore emissions from native forest harvesting, but count emissions from harvesting forests established after 1990 – thus creating a perverse incentive to harvest native forests rather than plantations for wood production. Comprehensive carbon accounting is essential and we agree with the Committee's recommendation that the Government must promote the reform of international carbon accounting rules.

1.25 Given that the harvesting of native forests generate huge volumes of greenhouse gas emissions there is no reason to wait for global accounting systems to be reformed before taking action to ensure that carbon-rich native forests are preserved and to ensure that forest products come from plantations.

Conclusion

1.26 History may well show that the international treaty about to be negotiated was the last opportunity to avoid catastrophic climate change. If this treaty is weak or negotiations end in failure the opportunity to protect the climate may have passed.

1.27 Australia, together with all industrialised nations, has the wealth and resources required to achieve much deeper emission cuts; all that is lacking is political will. Never in the history of human civilisation has more urgent and determined Government leadership been required.

Senator Christine Milne

Spokesperson on Climate Change and Energy

Minority Report by Senator Nick Xenophon

Background: nature of the problem that we are trying to solve

1.1 Anthropogenic climate change presents us with the most pressing and complex policy problem that we have faced. It is pressing because the window of opportunity in which we have to take the sort of abatement action needed to avoid irreversible, dangerous and potentially catastrophic climate change is small; and, on the basis of the findings from the March 2009 conference in Copenhagen, is getting smaller. It is complex because it has all the features that policy, whether at a global or national level, usually struggles to deal with. These include the fact that abatement has large upfront costs, with benefits that accrue in a relatively distant future and with some degree of uncertainty; the need to provide for the development aspirations of poorer countries and the emissions trajectories entailed by these; the uneven spread across the globe of net benefits from abatement; and the potential for 'free rider' issues created by the fact that no one country stands to gain from abatement efforts in the absence of concerted action. These last two issues create what Professor Garnaut has accurately characterised as a diabolical prisoner's dilemma problem.[1]

1.2 This overall context must inform the design of an emission trading scheme in a country like Australia with its small, open economy. There is a sensible policy case, as well as a strong ethical one, for Australia to take early emissions reduction action in order to break the potential deadlock created by the prisoner's dilemma and uphold the sort of global co-operative agreement required to address global climate change. We need to be clear that the brutally honest position is this: in the short to medium term the success of our domestic policy (indeed, of all advanced countries) will be a function of the ability to get all countries (notably the large emitting developing countries) on board, without which there will be no prospect of addressing climate change. [2]

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[1] Garnaut, R., *The Garnaut Climate Change Review: Final Report,* (2008) Commonwealth of Australia, pp 287-290

[2] The imperative of global action, particularly for poorer countries, is underlined by David Wheeler in *"Another Inconvenient Truth: A Carbon-Intensive South Faces Environmental Disaster, No Matter What the North Does",* Center for Global Development, Working Paper Number 134, December

1.3 In taking such action, Australia needs to adopt a scheme that is credible internationally and sustainable domestically. International credibility will be to a large extent a function of the abatement targets Australia sets for itself. Domestic policy sustainability is to a large extent a function of adjustment costs, particularly in the short to medium term when there are likely to be significant gaps in emission reductions efforts globally. Policy sustainability has an economic dimension – imposing large adjustment costs on the economy with no prospect of incremental global abatement gain is simply not an efficient economic proposition. And this impacts on the political dimension of policy sustainability by eroding support for emissions reduction, particularly in a time of economic uncertainty.

What are the policy issues that should govern the design of a carbon pollution reduction programme?

1.4 Given this particular background, what are the particular issues to consider as important in designing a carbon reduction programme?

1.5 Clearly the overarching goal is **environmental** – the abatement of greenhouse gas emissions. This is largely contingent on establishing the appropriate incentives to bring about substitution in production and consumption from emissions intensive goods and services to ones that are less so, and to prompt behavioural changes in consumers and producers. Abatement will, fundamentally, be investment driven. Firms will need to invest in a variety of activities – whether in R&D, in implementing new process or selling different goods and services – as they respond to changes in input costs, relative prices and changes in consumer demand.

1.6 The second set of issues consists of **adjustment issues**, which impact directly on the issue of domestic policy sustainability discussed previously. Adjustment issues range from the income effects on households stemming from the introduction of a price on carbon, to the impact on asset values of what the Government has called 'strongly affected' firms. Issues related to carbon leakage and the loss of

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2007. Wheeler's modelling suggests that even if rich countries emissions were reduced to zero, current emissions trends in poor countries would still place the world on course for serious climate change impacts.

competitiveness are adjustment issues that relate directly to the global nature of the abatement task and the prospect that, in the short to medium term, countries like Australia will be implementing emission reductions ahead of others.

1.7 **Carbon leakage and competitiveness** cut to the heart of both the economic and political dimensions of sustainability. While the political is often emphasised, it is important to underscore the economic efficiency aspects of both these issues too. Carbon leakage is a net cost to the global economy – it imposes adjustment costs with little or no return in terms of global abatement. Competitiveness losses can also be a global cost (and not just specific to Australia) as well. This will arise if carbon reduction schemes cause the relocation of activity away from Australia, when that activity would have been located in Australia had there been a concerted global effort to reduce emissions. The implication is that the introduction of a price of carbon in some countries but not in others will cause a distortion to the global allocation of production along lines of comparative advantage.

1.8 The third set of issues consists of **governance issues**. These include the potential for policy capture. Capture could manifest itself in a number of ways including: manipulation of the scheme parameters and its implementation; or manipulation of some other area of government policy (such as trade policy) in response to the effects (or supposed effects) of the carbon pollution reduction scheme.

1.9 Given these policy issues, a carbon pollution reduction scheme will be judged on the grounds of whether it is:

- effective in managing these different concerns, and any trade- offs between them;
- efficient in managing these concerns at least cost;
- ethical in terms of managing various equity and distributional issues that are raised by these concerns.

Critique of the CPRS and government approach

A weak target

1.10 Against this backdrop is a critique of the Government's approach as set out in the CPRS. Perhaps the most commonly heard criticism of the scheme is the overall target range of 5-25% that has been set. That target range is largely a reflection of the adjustment costs that may be expected, but also of the peculiarly high cost nature of the scheme that has been chosen. In respect of the former, it is likely that the Government's own modelling has understated the costs, in the short to medium term, of adjusting to a carbon price. This in turn is a reflection of the fact that the type of Computable General Equilibrium (CGE) model uses a full employment rule as its closure rule - that is, the economy is always at or near full employment levels, and responds to a shock almost immediately. In other words, for example, retrenched workers in the Pilbarra or in Newcastle become insurance agents in Melbourne or Sydney overnight. Clearly, this is unrealistic, and while the full employment rule and its consequent results can be a useful guide to what happens in the long term, it simply assumes away some of the most pressing policy problems in the short term. Indeed, it is quite likely that the Government is aware of the limitations of its modelling and has thus chosen a cautious approach as a consequence.

1.11 Setting aside issues of modelling, concerns regarding adjustments costs are also warranted on account of the high cost nature of the cap and trade mechanism within the CPRS, as compared to alternatives. This point is explained in further detail below when intensity-based approaches are discussed. The main issue is that the cap and trade approach essentially acts as a penalty-only mechanism: it penalises all emitters as a function of their emissions intensity, but offers no direct reward to firms that cut emissions.

1.12 If we marry the high cost aspect of the scheme design to concerns about adjustment that may not be captured in the modelling, then a relatively modest target range is a predictable outcome. It does, however, raise the question as to whether a more ambitious target could be adopted if an alternative scheme design were available that would be more attractive in managing adjustment concerns because the scheme has lower cost properties. This would be desirable from an environmental perspective, and in terms of sending a more credible signal internationally (recalling

here that the overarching objective sought through the early implementation of a carbon reduction scheme is to sustain a co-operative international agreement).

Not one but many schemes

1.13 The CPRS is a combination of several mechanisms and initiatives. Ostensibly, its central feature is a cap and trade mechanism, though it would be more appropriate to refer to it as a "quasi-cap and trade" mechanism. Under a standard cap and trade scheme, the quantity of emissions is fixed and the cost of emissions (i.e. the price of permits) is allowed to vary. In the case of the CPRS, this fixed quantitative restriction is relaxed. If the permit price reaches a certain level ($40 per tonne), the Government will issue an unlimited number of permits – as Richard Denniss put it in a recent presentation, the Government will start printing permits as if it were the central bank of Zimbabwe printing cash.[3] The price cap, as well as banking and borrowing provisions and gateway provisions that provide flexibility for the Government to adjust the overall targets in the light of prevailing circumstances reflect a concern on the part of the Government both to cap the overall costs of the scheme, and to limit volatility in prices. This in turn is motivated by a concern regarding the adjustment impact of permit price rising to higher than expected levels, and an acknowledgement that untrammelled volatility in permit prices is undesirable because of the investment uncertainty this generates.

1.14 **Mitigating the transitional adjustment impact** of emissions trading also provides a central motivation for revenue recycling, which under the CPRS would be undertaken through transfers to households and through tax offsets on transport. The transfers are mainly motivated on equity grounds, and specifically to offset the regressive income effect that the introduction of emissions trading can have through various channels (such as higher electricity prices).

1.15 **The proposals for emission-intensive, trade exposed (EITE) industries** differ significantly from other approaches to managing transitional issues. The method of permit allocation, which is tied to production and linked to an emissions intensity benchmark has strong affinities with the intensity-based approach discussed below. The main difference, as we shall see, is that while with normal intensity-based

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[3] Parliamentary Library Vital Issues Seminar, "*Carbon tax and emissions trading"*, 17 March 2009, audio available at: http://www.aph.gov.au/library/pubs/vis/index.htm

approaches, activities receive a net subsidy to the extent that they emit lower than a specified benchmark, under the EITES proposals activities will receive shielding (i.e. an implicit production subsidy) to the extent that their emissions intensity exceeds a certain benchmark. It is important to emphasise that under a cap and trade scheme, attempts to address competitiveness issues and carbon leakage by shielding firms from the cost of emissions must necessarily take the form of either a cash subsidy tied to production or a free permit allocation tied to production. An approach based on the former was recommended by Professor Garnaut, while the CPRS chose the latter route. Some of the drawbacks with the particular approach chosen by the CPRS are discussed below, but at this juncture the important point to note is that the proposals for the EITES involve a scheme that runs along qualitatively different lines to the central cap and trade mechanism.

1.16 The CPRS also includes as yet undeveloped proposals regarding **energy efficiency.** This is almost certainly likely to mirror "white certificate" schemes elsewhere and follow a baseline and credit approach, which again is substantially different to the cap and trade mechanism contemplated for the emissions trading proper.

1.17 Though not part of the CPRS itself, the proposed **MRET** will also follow a baseline and credit approach, in keeping with green certificate schemes found in other jurisdictions.

Commentary on the complexity of the CPRS

1.18 The CPRS is therefore a complex assemblage of different mechanisms. To some extent, all proposals for carbon reduction in a small open economy like Australia will have a degree of complexity. This simply stems from the wider, global context in which such schemes are implemented. Inevitably, reconciling the imperative for credible early action and domestic policy sustainability – through the management of adjustment issues – leads to multiple policy concerns and hence the need for multiple objectives. This is all the more true if the core of the reduction scheme is a particularly high cost proposal, as embodied by the CPRS. The critique that may be offered of the CPRS is that it selects instruments that are ill suited to the

wider policy context in which they are implemented, and to managing the policy concerns that stem from this.

Drawbacks of the CPRS vis a vis objectives sought

Environmental objectives

1.19 The CPRS does not perform well even on the one issue where it is often touted as having a clear advantage over other approaches – namely in providing certainty in the quantity of emissions reduction. For reasons already explained, the various safety valves included in the scheme preclude it from offering such certainty; or at least, what certainty there is exists only up to a certain point in circumstances when the demand for abatement exceeds projections. In this respect, the cap and trade proposal is not substantially different to an intensity-based approach or a tax, both of which allow for flexibility in emissions if the demand for abatement exceeds projections.

1.20 Moreover, the flexibility in the quantity of abatement under the CPRS is asymmetric – the cap loosens after a certain point on the upside when demand for abatement exceeds projections, but does not tighten if the demand for abatement undershoots projections (due to lower than expected emissions growth resulting, for instance, from economic growth that is lower than trend levels or because of unanticipated abatement having taken place e.g. through household initiatives). This is the much publicised issue of "additionality" that has been given a considerable degree of attention, and which means that under the current CPRS, the billions of dollars injected into funding insulation would lead to no additional abatement, but would rather shift the overall contribution made to abatement from large emitters to households (the Government's approach to remedy this is cumbersome and ineffective). The issue of additionality is not unique to the CPRS, but arises in all cap and trade schemes where targets are weak Indeed, this has led to calls for governments to intervene by putting a floor on carbon prices through periodic revisions of the overall cap – a form of intervention that is tantamount to converting the scheme into an intensity-based approach.

1.21 In contrast to the CPRS proposal, intensity-based measures and carbon taxes lead to a tightening of the cap when emissions undershoot expectations. This allows

for a greater degree of smoothness in the carbon price which in turn will provide a better basis for investment decisions including green industries and cleaner energy production. Indeed, the CPRS seems to have captured the worst of all worlds: it is a high costs scheme that, in attempting to contain those costs does away with the feature (certainty in reductions) touted as its greatest asset. Moreover, the asymmetrical nature of this modification removes any possibility of additionality abatement, a feature that has prompted calls for governments to intervene through target revisions.

EITES

1.22 There are several drawbacks to the approach used to handle EITES. Generally speaking, the Government is correct to avoid using border measures such as tariffs and border tax adjustments, as these would be complex to administer, inefficient, and almost certainly in contravention of global trade rules. The use of production subsidies would also be litigious from a WTO perspective to the extent that they are specific to certain firms and contingent on export performance and/or on the use of domestic inputs. The CPRS has got around that problem, on paper at least, by making its system of subsidies ("shielding") contingent on emissions intensity but this in turn raises other problems.

1.23 For a start, the granting of subsidies subject to whether an activity is in excess of a certain emissions threshold is perverse from an abatement viewpoint. Granted, the CPRS legislation does away with the problem that might have existed under the Green Paper proposals, namely that firms might be penalised if they cut emissions because they would drop below the threshold at which shielding was triggered. However, the proposals still mean that those firms that have been relatively efficient prior to the cut off date for measuring the emissions intensity thresholds are not rewarded for their efforts, which can have adverse dynamic efficiency consequences going forward.

1.24 A second issue is that the decision to selectively shield more emissions intensive firms or activities increases pressure on those less intensive trade exposed ones that are not shielded. This is not simply because they do not receive the financial benefit subsidies. A more fundamental issue is that for these firms, the shielding approach acts very much like a real exchange rate appreciation that is imposed specifically on them.

1.25 To see this, consider that the introduction of a price on carbon will inevitably increase the price of non-tradables relative to tradables (that is, the real exchange rate will appreciate). This is because tradable sectors are able to pass on the costs of the carbon price to a much greater extent than non-tradables given that the latter are essentially price takers. The introduction of shielding essentially carves out a sector of the tradables sector – the more emissions intensive – and protects them from the effects of this appreciation. But this simply means that the competitive impact of the price of carbon will fall more heavily on less emissions intensive activities. In particular, there will tend to be a shift in resources and factors of production away from these sectors to shielded sectors and to non-tradables. In this manner, the shielding approach is as much a tax on less emissions intensive activities as it is a subsidy to the more emissions intensive ones.

1.26 In effect, this creates disincentives for resource allocation towards activities that should on balance be promoted. Moreover, it is entirely possible that the disadvantaged sectors will seek relief through other avenues of policy, such as trade policy. This in turn can create further distortions that accentuate economic costs, and create trade tensions that pose an obstacle to securing the type of co-operation required to sustain a global agreement on climate change mitigation.

Governance issues

1.27 The administration of adjustment assistance through transfers, and more generally, the administration of permit revenues, raise a number of governance issues. For a start, the fact that revenues are required to mitigate the regressive impacts of the scheme on income distribution means that at least some of the double dividend (which could have been reaped through the use of permit revenue to cut distortionary taxes on labour and investment) will be foregone. Secondly, the administration of such transfers in a manner that does not affect consumption decisions is likely to be, at the least, problematic. A more general issue is that the large amounts of cash that will transit through government coffers raise all manner of possibilities for wasteful recycling. The modelling of scheme effects implicitly assumed that all recycling is done perfectly efficiently, and without creating any costs through distortions. This is unlikely to be the case. Indeed, experiences with government spending over the last few years suggest that governments are particularly bad at identifying socially optimal forms of spending.

Summary observations on the CPRS

1.28 In sum, the CPRS as it stands is ill equipped to initiate sustainable domestic reform in the realm of climate change policy. In particular, it presents a high cost approach to reform that creates various transitional adjustment issues. These have not been fully addressed in the economic modelling, and to the extent that they have been countenanced, have led to a variety of adjunct measures that (i) undermine the scheme's own aspirations to provide certainty in emissions reductions (ii) add various layers of complexity, notably through approaches to EITES and the recycling of auction revenues, that are conducive to serious economic distortions and problematic governance issues.

1.29 There is significant scope to build on the work done to date and improve the current design of the scheme.

Alternative approaches – an intensity-based approach

1.30 There are various types of scheme architecture that could be proposed as an alternative to the CPRS. While it is tempting to suggest that work on the design of a carbon reduction programme should recommence from scratch, pragmatism suggests that alternatives should build on work that has been done to date, and adapt existing proposals as far as possible.

Mechanics of an intensity-based approach

1.31 The approach proposed is termed an intensity-based approach, as it involves determining, for a particular activity or sector, an emission intensity baseline. Baselines across sector and activities in an economy are set at the level that achieves the desired emissions level. Any producer emitting more than the baseline has to acquire permits in excess of the baseline. Any producer emitting below the baseline is allowed to create and sell permits to those who need to buy permits. The revenue that low emitters earn can help pay for investing in low emission technology. The scheme works by simultaneously penalising higher emitters (just as occurs under a cap and trade) and rewarding lower emitters. In simple terms the scheme is a 'carrots' and 'sticks' approach.

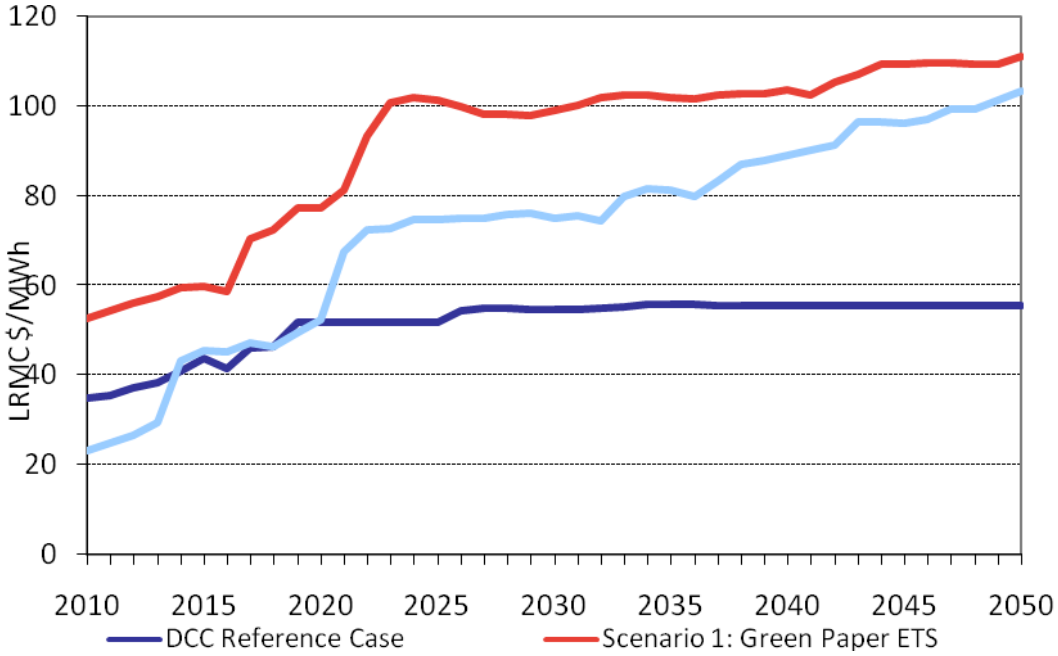
1.32 Conceptually, the scheme has similarities and differences with the cap and trade approach proposed by the CPRS. A cap and trade approach is in effect an intensity approach with an emissions baseline set at zero. This effectively entails an impost on all emissions. A higher baseline raises the threshold at which the cost impost sets in. Changing the threshold does not affect the extent to which high emitters are taxed relative to low emitters – rather, it simply means that the latter receive a net subsidy while the former face a net tax. What has changed is that the absolute level of cost impost is confined to the portion of emissions above the baseline. This in turn means that the absolute price effects of the intensity-based scheme are lower than under cap and trade. A cap and trade scheme could in theory achieve the same result by auctioning permits and then recycling revenue as a flat subsidy to producers. But this would involve the governance complexities of hauling revenue into the Treasury and out again, and the potential for capture that could arise as a consequence.

1.33 As already noted, the CPRS does indeed employ a variant of an intensity-based approach in its proposals for EITIs and shielding. Permits are allocated on the basis of output and subject to an emissions baseline. The main difference, however, is that subsidies kick in once the baseline is *exceeded*. Under the alternative intensity-based approach, the idea would be to create incentives to reduce emissions below the baseline.

Outcomes of this approach

1.34 One of the consequences of confining the cost impost to the proportion of emissions above the baseline is that it reduces the overall price impact of the scheme. Figure 1 (below) provides an overview of the relative price effects of this approach as compared to a cap and trade approach when applied to the electricity sector.

Figure 1:



1.35 The lower price effect is an important result as it deals with the principal adjustment concerns associated with the implementation of emissions trading: competitiveness effects, carbon leakage and regressive income effects. It also deals with these issues in a better and more systematic way than the proposals contained in the CPRS since:

- whereas the CPRS relies on developing a particular type of scheme for EITES to run in parallel with the cap and trade mechanism, the intensity approach would apply across the board to the economy;
- the intensity approach couples lower price impacts with incentives for producers to reduce emissions;
- whereas the CPRS proposals involve a large degree of revenue recycling to address adjustment issues, this approach internalises such transfers within the scheme.

1.36 One question that frequently arises concerns the impact of lower prices on impacts for abatement. In this context, it is important to distinguish between incentives on the supply side versus those on the demand side. On the supply side, incentives for substitution from high to low emissions technologies are preserved since what matters for substitution is the extent to which high emissions activities are taxed relative to low emissions ones. While the absolute value of the impost has decreased, in relative terms high emissions activities are still taxed relative to low emissions ones in the same manner as under cap and trade. The lower level of the absolute impost on producers is what mitigates adjustment issues – particularly for trade exposed activities where firms are price takers. The relativities in net taxation between high and low emissions activities is what sustains incentives to abate.

1.37 Concerns on the demand side are largely related to the effects of lower prices on energy consumption, and hence emissions. In response to this, it should be noted that for a start, demand response may well be muted under existing compensation arrangements for households, in which case the impact of the intensity-based approach would not be materially different to the CPRS proposals (though, as emphasised before, the revenue recycling associated with the CPRS would be avoided). Secondly, existing evidence suggests that demand side abatement is not particularly responsive to price signals.

1.38 There are a large number of abatement options that households could currently adopt on a "no-regrets" basis but that are not taken up, suggesting that other market failures are at work rather than the absence of a carbon cost in the price of energy. If so, a better approach to demand side abatement would be to rely less on the price signals dropping out of emissions trading, and more on a specific demand side abatement scheme, which would address underlying causes of market failure such as split incentives. Indeed, the CPRS proposals allude to the development of such approaches in respect of energy efficiency.

1.39 Demand side abatement schemes typically function as intensity-based approaches, and would therefore be a much more logical and natural extension of the intensity-based approach proposed here than it would be of the CPRS (to which it would be yet another adjunct mechanism).

Attaining abatement objectives

1.40 We already observed that the sum of the emissions baselines across the economy yields the overall reduction target that could be achieved. One issue that is frequently raised is that an intensity-based approach does not guarantee a fixed level of abatement – the worry is that if emissions grow faster than expected (say, because economic growth exceeds projections) then there is no quantitative mechanism that will force emissions back to the absolute target level as would happen under a cap. In theory, this is a valid criticism that could also be levelled at a tax. In practice, it is of little value since it presupposes that the alternative to the intensity-based scheme is an absolute cap. However, as observed earlier, this is not what is contemplated in the CPRS. There will be a variety of safety valve mechanisms that ensure that the cap is not a hard and fast one. The existence of these safety valves is in part a recognition of the higher cost impact of the cap and trade scheme.

1.41 Moreover, this criticism is turned on its head if we consider the opposite case in which emissions grow less fast than expected. Here, the cap implied by the intensity-based approach tightens. One implication of this is that the concerns regarding additionality raised in connection with the CPRS do not apply to an intensity-based approach. Another is that if there is a slump in economic growth, permit prices will not collapse as they would under cap and trade.

1.42 More generally, an intensity-based approach makes for less volatility in permit prices than the cap and trade approach, a point emphasised by Dr Frank Jotzo in his evidence before the Senate Standing Committee on Economics.[4] Smoothing volatility is desirable from an investment point of view.

1.43 To sum up, there is no reason to believe that the proposed intensity-based approach would fare any worse than the CPRS in confining emissions growth to a set target. Clearly, if the CPRS were to be amended to get rid of its safety valves then it would perform better in terms of abatement certainty, but this is unlikely to be adopted given the need for such safety valves to manage the adjustment issues created by the high cost nature of the CPRS. Moreover, the intensity-based approach fares better in managing these adjustment issues (on account of its lower price impacts), in

[4] Dr Frank Jotzo, *Proof Committee Hansard*,Exposure drafts of the legislation to implement the Carbon Pollution Reduction Scheme, 19 March 2009, p 36.

addressing additionality issues, and in managing carbon cost volatility. Because it is better at managing adjustment issue, it also offers the prospect of setting stronger targets than the ones proposed to date.

Implementing the intensity-based approach

1.44 Clearly, the central challenge in implementing an intensity-based approach lies in setting the different baselines. One option would be a linear reduction from historical levels. Under this approach, a sector or particular sub-sector would be subject to the same percentage reduction per year. This is the approach that is essentially adopted by the CPRS in respect of EITIs, though under the new approach this would be implemented across the board and not as part of a shielding package for activities that exceed an emissions intensity benchmark. The advantage of doing this is that it draws on information (carbon accounting) that will need to be collected as part of any scheme and applies a straightforward rule for abatement.

1.45 Another option is to set initial baselines according to world's best practice, and then specify a schedule of cuts thereafter either on a linear basis or on a view of expected abatement opportunities. The advantage of this is that it recognizes the scope for abatement. The disadvantage is that governments will typically be limited in their knowledge of expected abatement opportunities, and firms can take advantage of this asymmetry for rent seeking purposes.

1.46 There is also an option of setting a zero baseline for some sectors, which in effect means a reversion to a cap and trade scheme. Indeed, over time, as cuts are implemented to the baseline, the intensity-based approach will converge to the cap and trade approach. One way of looking at this is to suggest that the intensity-based approach will be used to manage the transitional adjustment issues associated with the introduction of emissions trading and, as these issues diminish (for example, as the participation of other countries in a cooperative solution is secured) the baselines can be phased down so that the intensity-based approach converges on a cap and trade approach. In effect, the intensity-based approach can be characterised as a "transition and convergence" approach.

Governance concerns

1.47 Intensity-based approaches are sometimes criticised on the grounds that they pose various governance challenges in terms of administrative requirements and

dangers from rent seeking. In response, it is important to note that all schemes are exposed to these, and that the CPRS proposals are particularly exposed to such concerns because of the plethora of adjunct instruments that are required to manage the adjustment costs associated with the scheme (to which must also be added the risk that the adjustment costs could spill over into governance challenges for other areas of policy such as trade policy).

1.48 Specifically in relation to the intensity-based scheme, it should be noted that the informational base required to run it is similar to the one required for the CPRS. Both require and draw on information drawn from firms' carbon accounting. Under the intensity-based approach, it would be necessary to guard against efforts to secure baselines that are too generous and that allow unwarranted gains for producers that perform better than baselines. One can address this challenge by drawing on a range of objective measures such as existing emissions levels, and agreed indicators of world's best practice.

1.49 In setting the baselines, it would also be necessary to take into account not only how resources are allocated within particular activities, but also how the baselines across the economy affect resource allocation across sectors and activities. This would require some form of modelling. While this is a demanding exercise, it is no more demanding than (properly) modelling the impacts of any other type of scheme.

Responses to critiques of the baseline and credit and intensity-based schemes

1.50 This note sets out the main criticisms that have been made of the intensity-based approach, and the responses to them.

1.51 The intensity-based approach creates a misallocation of resources by diverting a country's resources from high polluters in a low-emissions industry to low-emitters in a high pollution industry.

1.52 The underlying argument is that the CPRS sends a price signal to consumers: this encourages both supply side abatement (i.e. switching production from high to low emitters within a sector) and demand side abatement (i.e. switching consumption from high emitting *sectors* to low emitting *sectors*, where the end products are substitutes). It is argued the intensity-based allocation targets the former but not the

latter: it mutes price effects and therefore discourages substitution away from high emissions activities to low emissions activities.

1.53 The above is an academic criticism that is of little practical consequence.

- Opportunities for demand side abatement (or substitution of goods) are very limited, are generally not very responsive to price signals, and (where applicable) are more feasible in the long run;
- The (limited) examples of sectors that may be substitutes are trade exposed, hence a price signal is not feasible anyway (i.e. Australia is a price taker in global markets);
- The muting of the price signal is only transitional: over time the baselines for each sector fall and the effects of the scheme becomes more like cap and trade in the long run.

1.54 In practice, the criticism that intensity-based approaches lead to a serious misallocation of resources is overblown because it overstates the importance attached to abatement through demand side responses, and understates the problems that arise from trade exposure.

1.55 On the demand side front, the empirical evidence suggests that the most significant abatement opportunities for Australia are not primarily a function of demand side responses to product market prices. The McKinsey research into abatement cost curves shows a significant number of negative cost abatement options; the fact that these are not exercised at present suggests that there are market failures at work that are unlikely to be addressed by price signals, but would be more likely addressed by specific demand side programs. Moreover, the Government's own estimates of demand side abatement are based on a flawed calculus. Its modelling attributes approximately 120Mt of abatement to demand side response in the electricity sector in 2050. This result overstates the benefits of demand side reduction since they incorrectly use current emissions intensity of electricity of around 1tCO2/MWh to calculate emissions avoided from a reduction in MWh consumed. This is inconsistent with their own modelling results, since the emissions intensity of the market is around 0.1tCO2/MWh by 2050. This means that emissions avoided through demand side abatement would be 1/10 of what they suggest.

1.56 The issue of trade exposure is important since that has a material impact on how carbon pricing affects product market pricing. To see this, consider the case where you have one trade exposed sector such as a smelter and another manufacturer that is not trade exposed and less emissions intensive. Assume that the smelter is trade exposed and is a price taker in the world market, but that the other manufacturer is not, then any carbon price effects on the smelter would translate into an increase in imports and a substitution away from the goods produced by the other manufacturing industry. The higher the price the stronger the effect. This simply points to the risks associated with carbon leakage and the potential distortions that could arise by implementing a cap and trade scheme in a world where not everyone undertakes reduction commitments.

1.57 To sum up, while the price effects of the intensity-based approach have the potential to cause some distortions, they are unlikely to be severe. This could be tested through modelling. Moreover, the costs of those distortions that do arise need to be set against the costs of managing carbon leakage and the distortions this creates; the critique of intensity-based approaches set out above is essentially one-sided since it neglects the benefits side of the ledger. Moreover, because the intensity-based approach converges over time to a cap and trade outcome as baselines are cut, the initial distortions will diminish over time.

Intensity-based approaches are difficult to administer because the baselines are difficult to establish

1.58 There are a variety of ways of setting the relevant baseline. One would be to adopt some best practice base. The other would be to introduce linear cuts to emissions intensity over time. The latter approach has been suggested, for example, in New Zealand in regard to its proposed allocation for agriculture (which follows an intensity-based approach). If one were to adopt a linear cut approach, then the essential requirements are historical – actual emissions intensity and production data. This is not fundamentally different as a requirement from what is needed to run a cap and trade scheme, particularly a cap and trade scheme that also has an emissions intensity-based scheme appended to it (as is the case with CPRS, given that the approach followed in regard to trade exposed sectors is an output based allocation system).

1.59 More generally, this criticism reveals a fundamental misunderstanding of the complexities involved in running a cap and trade scheme in a context where competitiveness effects, carbon leakage effects and adjustment effects need to be managed. If these issues are to be addressed, complexities will inevitably arise in developing mechanisms that determine which producers are eligible for assistance on account of trade exposure and how much, or in developing mechanisms that address household adjustment effects.

1.60 This is abundantly illustrated by the CPRS, which has had to introduce a number of additional mechanisms (such as specific scheme for EITE sectors) to manage these adverse economic effects. These additional mechanisms are a direct function of the high cost impacts of the CPRS on a small open economy – one that is avoided under the intensity-based approach.

1.61 The appropriate comparison is therefore to compare the complexities of administering an intensity-based approach with the complexities involved in running a cap and trade scheme and all the add ons that are necessary to make such a scheme workable. It is somewhat disingenuous to dismiss the intensity-based approach as complex when the scheme currently on the table is one of Byzantine complexity.

Intensity-based approaches are susceptible to rent seeking

1.62 There is no principled reason as to why the intensity-based approach should be more susceptible to rent seeking and manipulation that any other scheme. Indeed, under a cap and trade scheme, such pressures are likely to emerge as a consequence of the impact such a scheme has on competitiveness and carbon leakage. For example, if the Government (as it has done) attempts to limit assistance to a certain subset of EITES that is likely to lead to those who are excluded to lobby in favour of inclusion. This has been the Government's experience ever since the Green Paper came out. More fundamentally, attempts to manage the trade impacts of the CPRS through approaches that arbitrarily cut off assistance are likely to be costly since they (i) run the risk of resource misallocation and (ii) increase the incentives for lobbying.

1.63 More insidiously, the price effects of a cap and trade scheme are likely to increase pressure on other areas of policy – notably trade policy. Pressures for protectionist trade policies are always on the increase globally in times of recession, and adding the cost impacts of a cap and trade scheme will only make matters worse.

Intensity-based delivers less certain abatement

1.64 While intensity-based approaches allow for more flex in the target if actual emissions diverge from projected ones, deviations would be expected to balance out over time as the emissions intensity of the economy falls (hence the link between emissions and growth becomes marginal).

1.65 Moreover, unlike to CPRS, the intensity-based approach can accommodate additional and unexpected abatement by tightening the implied cap. For example, voluntary abatement would be effective under this scheme (as opposed to simply easing the burden on other sectors under the CPRS).

1.66 A more fundamental issue is that this critique implies that the CPRS will deliver certainty in abatement. It will not. As they stand, the CPRS proposes an administered price for the first year, followed by the introduction of a price ceiling in subsequent years. This effectively says that the government is prepared to deliver abatement, but only up to a particular cost threshold. Even then, there is a heavy reliance on permit imports to meet Australia's target, so there is no certainty over domestic emissions in any case. The notion that the CPRS would deliver greater certainty in abatement is repeatedly propounded furphy.

Intensity-based approaches are not viable in an international context

1.67 The idea that a cap and trade scheme is viable in an international context but an intensity approach is not is largely predicated on the notion that the former will deliver certainty in abatement. As already indicated, this is largely an illusion, given the inclination to use safety mechanisms such as price caps in the CPRS. Secondly, even if that issue were to be set aside, the fact is that worries about the competitiveness effects of emissions trading (which are aggravated under a cap and trade scheme) have led major developed emitters to water down their targeted reductions. Thus, even if a cap and trade were to deliver more certainty, this has come at the expense of environmental outcomes. Low targets have become the antidote to poor emissions scheme design. These low targets have, and will continue to, make it difficult to secure international agreement on emission reduction schemes.

1.68 Fundamentally, the choice under a cap and trade scheme is between targets that are high but cannot be sustained, or between targets that can be sustained but are not meaningful. Consequently, there is no intrinsic value or requirement in pursuing a

cap and trade scheme from an international perspective. On the other hand, because the intensity-based approach handles the main adjustment issues related to leakage and competitiveness more efficiently, it offers the scope for pursuing tougher targets, which enhances the chances of securing international agreement. Moreover, given that the scheme has attractive properties for economies like China and India, successfully modelling its implementation can be beneficial to drawing these countries on board.

Canada's decision to abandon the scheme means it has no relevance to Australia

1.69 Canada's decision to harmonise its scheme with that of the US is logical given that Canada's trade is dominated by the US, and so there are gains to it from close integration with the US. If anything, the decision illustrates the importance of choosing a scheme that is appropriate for a particular context.

1.70 The notion that the intensity-based approach is consigned to the "dustbin of history" is fanciful and not supported by the facts. As a matter of practice, if one looks at countries considering emissions trading, many have incorporated intensity-based proposals to some extent in their approach. The CPRS proposes an intensity-based approach in addressing the issue of EITES; New Zealand has proposed an intensity-based approach in respect of agriculture; the EU proposes an intensity-based approach to deal with sector such as aluminium and cement, both in its own scheme and in the context of international sector agreements; Switzerland and Japan have proposed intensity-based approaches.

1.71 The issue is not that intensity-based approaches have lost their relevance. The issue is more that countries such as Australia have proposed a piecemeal approach that combines cap and trade with intensity-based measures, which is costly and distortive. What proponents of intensity-based approaches suggest is to adopt an intensity-based approach on a systematic basis, on the grounds that it can better handle the transitional adjustment issues, and progress over time toward a cap and trade scheme.

Reduction, Adaptation & Mitigation

1.72 Much of the policy discussion surrounding climate change has focused on reducing greenhouse gas emissions, which is understandable given the imperative of

stabilizing atmospheric concentrations of CO2. However, policies that help societies to adapt to the effects of climate change are also a vital part of the story. Both the Stern Review and Professor Garnaut's review devote important chapters to the issue of adaptation. By contrast, the topic has generally been neglected by the Federal Government – there is no mention of it in either the Green or White Papers.

1.73 The adaptation story is vital for two reasons. One is that a lot of climate change is already locked in through the accumulation of GHGs in the atmosphere. We are already seeing some evidence globally of changed weather patterns. Consequently, even under the most optimistic assumptions about reduction, we will experience climate change impacts over the coming years and decades. We thus have an adaptation issue in the short to medium term.

1.74 Secondly, even assuming a global agreement on reduction that makes significant cuts to GHGs, there will still be some residual climate change, given that it is almost inevitable that sea temperatures will rise by 2 degrees. This creates an adaptation issue in the longer run.

1.75 Climate change impacts have the potential to affect a wide range of activities and assets, from ecosystems to agriculture, to housing and human health. Australia is particularly vulnerable to climate change given, amongst other things, the fragility of a number of its ecosystems, its comparative advantage in international trade in agriculture, and the proportion of its population that live in low lying coastal areas. Absent adaptation, climate change is likely to cause severe stress to Australian society, its economy and the environment.

1.76 One of the important aspects of adaptation policy is that people and businesses are quite capable of developing adaptive responses. Farmers, for example, have a long track record of adapting to changing conditions. But that is not a justification for policy neglect. Individuals and businesses need information to make decisions, and consequently there is a need for research and development, as well as the dissemination of information. Sometimes individuals and businesses do not make decisions that are the most beneficial for society as a whole since they do not see the rewards from making those decisions (or the costs of not doing so). And some individuals, notably the aged, the sick and the poor, have a diminished capacity to adapt. So there is a role for government to step in. Finally, government itself can be the main culprit through badly designed policies. For example, if water resources are

not properly allocated or priced, then the damages from climate change will be greater. There is likely to be considerable scope for government policy action that delivers a win on adaptation as well as other environmental and resource management grounds.

1.77 So there is no question that a reasoned approach to adaptation is required. Thus far, whatever thinking there has been on adaptation has largely been undertaken at the state level. While that is not wrong in and of itself – since climate change will have particular localized effects – it would also be wrong not to address that challenge at a federal level. An approach where reduction is tackled federally but adaptation is left to the states can easily perpetuate what Professor Garnaut calls a false dichotomy between the two. Secondly, many adaptation issues cross state boundaries – water management being an obvious example – and consequently will demand a broader approach.

1.78 Further, adaptation won't happen immediately – a lengthy and expensive transition will be required, even if it is pursued with urgency. This will also require the effects of climate change to be managed, or ***mitigated.***

1.79 Since climate change will be accompanied by more extreme weather events such as more severe storms, floods, droughts and coastal erosion, there needs to be a public policy response to mitigate the effects of these inevitable events.

1.80 As this is a national problem it needs to be coordinated at a federal level with adequate resources to ensure a coordinated national approach.

1.81 In summary, there are three essential elements to an effective climate change policy. It must involve an effective reduction target based on a well designed emissions trading scheme that promotes investment certainty on low and zero emissions technologies, taking into account Australia's international competitiveness.

1.82 Further, there must be an integrated adaptation and mitigation policy that best prepares Australia for the inevitable aspects of climate change.

Concluding observations

1.83 One again, it is important to recall what the overarching objective is: to initiate sustainable domestic policy reforms with a view to securing a global co-operative outcome without which domestic efforts will largely be in vain. Meeting this objective requires implementing credible targets and managing adjustment costs effectively. The CPRS does neither. Its approach to managing adjustment issues raises all sorts of governance and policy problems, and the Government tacitly acknowledges the high cost nature of its proposals through the weakness of its target and measures that do away with the oft-touted abatement certainty offered by a cap and trade scheme.

1.84 The intensity-based approach affords a more efficient management of adjustment costs, while preserving abatement incentives. Its implementation can build upon efforts undertaken to date; indeed, over time, it could transition and converge to a cap and trade model as adjustment issues are managed and global cooperation is firmer.

Recommendations

Recommendation 1

1.85 That the Bills not be passed in their current form.

Recommendation 2

1.86 That there be a comprehensive adaptation policy with adequate resources to ensure a coordinated national approach for managing the effects of climate change.

Recommendation 3

1.87 Revising abatement targets upwards to a level that is more likely to secure an effective global agreement on emissions reductions, in order to stabilize atmospheric concentrations of Greenhouse gases at not more than 450 ppm.

Recommendation 4

1.88 That Treasury produce modelling on other types of schemes that have been proposed as alternatives to CPRS, including:

- **a conventional baseline-and-credit scheme;**
- **an intensity model;**
- **a carbon tax;**
- **a consumption-based carbon tax;**
- **the McKibbin hybrid.**

NICK XENOPHON
Independent Senator for South Australia

APPENDIX 1

Submissions Received

Submission Number	Submission
1	MBD Biodiesel Ltd
2	Mr Robert Stringer
3	Mr Loris Erik Kent Hemlof
4	Mr David Archibald
5	Unallocated
6	Nature.Net Pty Ltd
7	Mr Ian McClintock
8	Cement Industry Federation
9	Institute of Public Affairs (IPA)
10	Professor Joshua Gans
11	Mr Stephen Mooney
12	Ford Motor Company of Australia Limited
13	Mr Kevin Cox
14	Mr Ian T. Dunlop
15	Mr Bruce Ferabend
16	Renewable Fuels Australia (RFA - Biofuels Research & Industry Development)
17	CONFIDENTIAL
18	Mr Eriks Velins
19	Dr. A. Barrie Pittock, PSM
20	Mr Keith Alder & Mr John Reynolds
21	Ms Acacia Rose
22	Jennifer and Neville Crew
23	Mr Geoffrey F. Davies, Australian National University
24	Productivity Commission
25	Mr Mark Snodgrass
26	Dr Michael Leach
27	Nic Denshire
28	Ian McGregor
29	Tegan Mossop
30	Anne Hodgson
31	Michael Beasley
32	Mark Byrne
33	Jo Errey
34	Emily Baker
35	James Pillsbury
36	George Butrumlis
37	Dorothy Waterfield
38	Max Phillips
39	John Patrick
40	Rosemary Young
41	David Nash
42	Jim Darley
43	David Blair
44	Joan Landy
45	Hans Groenewegen
46	Adam Watson
47	Christian, Mitchell, Muin & Keith Tym
48	Ian Rudd
49	Robin Eadha
50	Mark Beyers
51	Maureen Pearl
52	Marie Fisher
53	Simon Mathis
54	Warwick Smith
55	Ed Adamthwaite
56	Ann Johns
57	Unallocated
58	Neil Robinson
59	Robert Burke
60	Hugh Wilson
61	Sheila McInnes
62	Brett Hedger
63	Andrew Laing
64	Martin Oakley
65	Fiona Bradley
66	Caitlin McGee
67	Katie Hannan
68	Robert Blanco
69	Lionel Irwin
70	John Engelmann
71	Robert Burke
72	Bernard Terry
73	Lyle Passfield
74	Mark Byrne
75	Liz Hodge
76	Paul Cuttler
77	Michelle Lougoon
78	Sonia Paterson
79	Clare Averill
80	Rosemary Walters
81	Annalisa Koeman
82	Penelle Cameron
83	Fiona Semple

84 Shawn Buchan
85 Robert Macleod
86 Ed Sulway
87 Elaine Godden & John Wong
88 Jo Mead
89 Lindy McMahon
90 Melissa Risely
91 Virginia Greasley
92 Ben Aspinall
93 Peter Chubb
94 Michelle Cox
95 John McClinton
96 Greg Berry
97 Helen Wilson
98 Steve Posselt
99 Basil Smith
100 Julie Thomas
101 Owen Bailey
102 Rachael Chick
103 Brian Stevens
104 Margaret Keath
105 Michelle Wentworth
106 Anne Pettit
107 Paul Stretton
108 Aileen Vening
109 Jan Muir
110 Karl Grimm
111 Lindsay Peters
112 Craig Smith
113 Peter Stirling
114 Mary Stammers
115 Martin Williams
116 James Tedder
117 Michael Hassett
118 David Spicer
119 Jan Mitchell
120 Georgia Blomberg
121 Richard Hole
122 Ian Colley
123 John Harris
124 Barry Naughten
125 Jonathan Silberg
126 Corinne Coombs
127 Corbin Stack
128 Robert & Catherine Money
129 Gillian Collins
130 Alan Glover
131 John Biggs
132 Thomas Fouracre
133 Sandy Pimm
134 Lynette Chamas
135 Margaret Deans
136 Angela McGowan
137 Noel Grivas
138 Andrea Kaszick
139 Peter Williams
140 Greg Barry
141 Matt Crosby
142 Susan Pedersen
143 Janet Armstrong
144 David Wood
145 Ian Bragg
146 Peter de Ruyter
147 Warren Blore
148 Marjorie Johnson
149 David Thomas
150 Erst Carmichael
151 Nicholas Goode
152 David Turnbull
153 Katie Savage
154 Dave Kermode
155 Anthony van den Bergh
156 Janette Lansdowne
157 Karen Schmidt
158 Joe Benshemesh
159 Alistair Nairn
160 Annie Hopkins
161 Sharyn Munro
162 Betty Haywood
163 Geoff Quick
164 Carol Sparks
165 Benjamin Miller
166 Adam, Denise & Amber-Rose Woodhams
167 Hilary Cadman
168 Scott Collins
169 Elizabeth Grace
170 James & Clare Rourke
171 Lyn Kellett
172 Aviva Sheb'a
173 David Gothard
174 Stafford Ray
175 KT Jones
176 Karuna Maxwell Family
177 John McKeon
178 Kevin Cox
179 Daniel Kaan
180 Margaret Kerr
181 Linden Salter-Duke
182 Shaun Gorman
183 Sarah Davies
184 Diane Sanna
185 Miguel Pez
186 Steven Weathers
187 Giordano Nanni
188 Peter Ferris

189 Michael Burston
190 Julie
191 Mieke Elzer
192 Richard Okill
193 Andrew Bagnara
194 Janet Rice
195 Kristan Baker
196 Paul van den Bergen
197 Tom Gosling
198 John Passant
199 Angela Lindstad
200 Ian Gardiner
201 Juliet Savin
202 Mos Day
203 Tess McCabe
204 Peter Markus
205 Ame Christiansen
206 Jan Molloy
207 Edward Kent
208 India Ollerenshaw
209 Meryn C
210 Matthew Frawley
211 Kerry Tait
212 Peter Heffernan
213 David Schultz
214 Malcolm Coulter
215 Erica Jolly
216 John C. Massam
217 Allan Jeffreys
218 Elaine Valton
219 Alan Greenhalgh
220 Tracey Larkin
221 Julius & Felicity Timmerman
222 John Reay
223 Malcolm Cliff
224 Shaun Taliana
225 Philip Machanick
226 Russell Kelly
227 Romel
228 John T D Wood
229 Michael Gordon
230 Lucian Weyland
231 Natasha
232 Lisa Thurston
233 Darren Lewin-Hill
234 Phillip Otake
235 Mark Winter
236 Michael Clanchy
237 Kevin Taylor
238 David Turnbull
239 The Clark Family
240 Jess Abrahams
241 Rob Ryan
242 Michael S Cox
243 Guido Cifali
244 Ben Henley
245 Margaret RoadKnight
246 Christine & Keith Cordwell
247 Dianne Powell
248 Martin Hogan
249 Aaron Jacobs
250 Emma Brindal
251 Jan O'Leary
252 Myles O'Keeffe
253 John Owen
254 Stephen Armstrong
255 Agnes Adorjan
256 Carol Neist
257 Lynn Wood
258 Leonie Stubbs
259 Helen Tuckey
260 Matt Mushalik
261 Hatch
262 Mr Chris Mills
263 Climate Change Balmain-Rozelle (CCBR)
264 Locals Into Victoria's Environment (LIVE)
265 Ms Estelle Ross
266 Associate Professor Colin Butler, Australian National University
267 Ms Jane Gilchrist
268 Ms Lola Jones
269 Ms Carly Cornish
270 Mr Keith Cordwell
271 Professor Andrew Blakers, Australian National University
272 Sam Keenan
273 Dr Gideon Polya
274 CarbonShift Pty Ltd
275 Mr Alistair Todd
276 Mount Alexander Sustainability Group
277 CHIPSTOP
278 Dr Martin Gellender
279 COALPAC PTY LTD
280 Mr Siarn James
281 Mr Robert Humphreys
282 Mr Paul Pollard
283 Malcolm Teggins
284 Wheatley Global Pty Ltd
285 Mr Steven Lade
286 Mr Klaus Weber
287 Mr Brett Montgomery
288 Dr Barney Foran, Independent Scientist

289 Dr John Quiggin
290 DomGas Alliance
291 Mr Larry Lohmann
292 Australian Council of Super Investors (ACSI)
293 Degree Celsius
294 Dr David Mills
295 J McRae
296 Jacqueline Christensen
297 David Westmore
298 Martin Naylor
299 Peter von Betouch
300 Dawn Jecks
301 Maggie Poole-Johnson
302 Paul Atkins
303 Colin Smith
304 Airconditioning and Refrigeration Equipment Manufacturers Association (AREMA)
305 Refrigerants Australia
306 Ms Katherine McDermott
307 Energy Networks Association (ENA)
308 Rio Tinto
309 Envirogen Pty Limited
310 CIVIL CONTRACTORS FEDERATION (CFF)
311 Uniting Justice Australia
312 CO2 Australia Limited
313 Sustainable Living Fabrics P/L
314 Quintessence Pty. Ltd.
315 Mr Scott N. George
316 CSR Limited
317 WWF Australia
318 Australian Sustainable Built Environment Council (ASBEC)
319 Mr John McDonald
320 Climate Emergency Network
321 Families Fighting Climate Change
322 NewAustralia
323 Mr George Stavrias
324 Mr David T. Bath
325 Peter Campbell
326 Visy
327 Lloyd Energy Systems Pty Ltd
328 Cool nrg
329 Supreme Master Ching Hai International Association: Australia
330 Australian Food and Grocery Council (AFGC)
331 Transpacific Industries Group Ltd
332 Alcoa of Australia
333 Ballarat Renewable Energy and Zero Emissions Inc. (BREAZE)
334 Leighton Holdings Limited
335 Australian Rail Track Corporation Ltd
336 Mr Brian Bahnisch
337 Hydro Aluminium Kurri Kurri Pty Ltd
338 The Carbon Sense Coalition
339 Tourism & Transport Forum
340 Dr Judith Ajani, The Australian National University
341 Water Services Association of Australia
342 Climate Action Network Australia
343 Humane Society International - Australia
344 Alcoa Australia Rolled Products (AAPR)
345 The Shell Company of Australia Limited
346 Australian Pipeline Industry Association (APIA)
347 Hydro Tasmania
348 Rebekah Christensen, Deanna Howland, Iain Murchland, Rachel Murchland and Rowan Steele
349 Australian Plantation Products and Paper Industry Council (A3P)
350 Jessie Wells, UQ Climate for Change
351 Engineers Australia
352 Australian Aluminium Council
353 TEAR Australia
354 Brisbane City Council
355 Grain Growers Association Limited
356 Green Institute
357 Schlumberger Carbon Services Australia
358 Nature Conservation Council of New South Wales
359 City of Port Phillip
360 Prof Ian Enting, The University of Melbourne
361 Perdaman Industries
362 BlueScope Steel and OneSteel
363 Mr Keith Burrows
364 Australian Industry Greenhouse Network (AIGN)
365 Australasian Railway Association
366 Mr Matthew Trigg
367 Lms Generation Pty Ltd
368 ASCIANO LIMITED
369 Association of Consulting Engineers Australia (ACEA)

370 PricewaterhouseCoopers Australia
371 Dr Peter Wood, The Australian National University
372 Queensland Farmers' Federation
373 GRIFFIN ENERGY
374 Pacific Hydro
375 Woodside Energy Ltd.
376 ConocoPhillips
377 Voluntary Carbon Markets Association (VCMA)
378 Clean Energy Council
379 Chamber of Commerce and Industry WA
380 CONFIDENTIAL
381 Sustainable Living Tasmania (Tasmanian Environment Centre Inc.)
382 Australian Retailers Association
383 BP Australia
384 ACCIONA
385 Chevron Australia Pty Ltd
386 Westpac
387 The Western Australian Farmers Federation (Inc.) (WAFarmers)
388 ERM Power
389 Climate Action Newtown
390 Mr Michael Oliver
391 Mr Brett Robertson
392 Australian Conservation Foundation
393 Mr Mark Andrews
394 Vestas Wind Systems A/S
395 Australian Petroleum Production & Exploration Association Limited (APPEA)
396 Rising Tide Newcastle
397 Ms Nichola Donovan
398 Mr Ian Lee
399 Ms Kathryn Healey
400 Ms Jo Maiden
401 Doctors for the Environment Australia, Inc.
402 Grant Thornton
403 InterGen
404 Environment Business Australia
405 Queensland Resources Council
406 The Climate Institute
407 Engineered Wood Products Association of Australasia
408 Solarquip
409 Environment Victoria
410 AUSTRALIAN INSTITUTE OF COMPANY DIRECTORS
411 Australian Bankers' Association Inc.
412 Wentworth Group of Concerned Scientists
413 AUSTRALIAN RAIL TRACK CORPORATION (ARTC)
414 Dr Frank Jotzo, The Australian National University
415 Public Interest Advocacy Centre
416 Environment Centre of the NT
417 J. PIERS WARNER
418 Climate Action Hobart
419 Australian Chamber of Commerce and Industry (ACCI)
420 Australian Institute of Architects
421 Lend Lease, Lincolne Scott and Advanced Environmental
422 Lawyers for Forests
423 Australian Academy of Science
424 Energy Supply Association of Australia
425 Minerals Council of Australia
426 Mr Yasir Assam
427 Global Sustainability at RMIT University
428 Eternal Source
429 Dr Graham Hughes, The Australian National University
430 Michael Van Boeckel
431 Professor Jerry Vanclay, Southern Cross University
432 Conservation Council of Western Australia
433 Mr Kevin Haskew
434 Darwin Climate Action Group
435 Ms Debbie Hudson
436 Mr Reg Brownell M Ec
437 Mr Peter G Morris
438 Ms Karinda Stone
439 Mr Bruce Leitch
440 Govind Maksay
441 Mr Bruce Milne
442 Mr Frank Campbell
443 Nature.Net Pty Ltd
444 Mr Michael Lewin
445 Mr Wil Blackburn
446 Ms Andrea Pape
447 Ms Claire Hudson
448 Mr Ian MacDougall
449 Ms Genevieve Searle
450 Ms Dirima Cuthbert
451 Mr Frederick C. Bell
452 Ms Janet Barlow
453 Dr Melanie Fitzpatrick
454 Mr Geoff Holman

455 Dr James Risbey
456 CHOICE
457 Think Brick Australia
458 Waste Contractors & Recyclers Association of NSW
459 Santos Ltd.
460 Cement Australia Pty Ltd
461 Piper Alderman
462 Minister Simon Corbell MLA, ACT Government
463 Australian Meat Industry Council
464 Australian Forest Growers
465 The Oil Mallee Association Inc
466 Energy Users Association of Australia (EUAA)
467 Australian Landfill Owners Association (ALOA)
468 National Lime Association of Australia
469 Australian Dairy Industry Council (ADIC)
470 Ms Andrea Wilson
471 Mr Don Owers
472 Ms Jackie Yowell
473 Mr Craig Foster
474 Ms Ada Castle
475 Ms Kim Barrett
476 Mr Michael Gray
477 MrJohn Crawford
478 Ms Kay Elsden
479 Rev. Brian Woodhouse
480 Mr Peter Lanius
481 Jamberoo FutureCare
482 Dr Gavin M Wright
483 Mr Mac Wilson
484 R.I.Buchan-Hepburn
485 The Biodiesel Station
486 West Hobart Environment Network
487 Ms Lyndall McCormack
488 Mr Timothy Curtin
489 Mr Andrew Greenhill
490 Mr Michael Clark
491 Ms Karen Alexander
492 Mr Daniel McDonald
493 Bus Industry Confederation of Australia
494 Dr Paul Taylor
495 Ms Amanda Lehman
496 Ms Estelle Ross
497 Mr Robert Williams
498 Carbon Coaliton Against Global Warming
499 Investor Group on Climate Change
500 SA Water
501 Business Council of Australia
502 City of Charles Sturt
503 City of Sydney Council
504 Australian Financial Markets Association
505 Council of Manningham (VIC)
506 Burrup Fertilisers Pty Ltd
507 National Farmers' Federation
508 Dr Ted Christie
509 Oxfam Australia
510 Australian Academy of Technological Sciences and Engineering
511 CONFIDENTIAL
512 Roaring 40s
513 KPMG
514 Greenpeace Australia Pacific
515 Carbon Markets and Investors Association, Australian Working Group (CMIA AWG)
516 Origin Energy
517 Conservation Council of South Australia
518 Ms Janet Barlow
519 ExxonMobil Australia Group
520 Australian Coal Association
521 SA Government
522 Australian Services Union
523 Australian Farm Institute
524 ICLEI Oceania
525 Ms Erin Lindwall
526 Ms Vicki Kyriakakis
527 Ms Gillian Castellino
528 Mr John Patterson
529 Dandenong Ranges Community Bushfire Group
530 Mr Oliver Coleman
531 Professor Matthew England
532 Ms Sherida McKean
533 Mr Bill Grove
534 Global Environmental Industries Pty Ltd
535 Arid Lands Environment Centre (ALEC)
536 Ms Yvette Vardy
537 Professor Brian Andrew
538 Mr Cornelis J F Smit
539 Mr Joel Dignam
540 Central Victorian Greenhouse Alliance (CVGA)
541 Mr Graeme Parsons
542 Mr Mike Tsilfidis

543 Ms Linda Rewbridge
544 Mr Peter Langlands
545 Mr Nicholas MACLELLAN
546 Dr Louise Crossley
547 Mr Richard Cassels, Principal of Climate Leadership
548 Mr Nigel Waters
549 Wodonga Albury Towards Climate Health (WATCH)
550 Ms Susanne Scobie
551 Mr Douglas McIver
552 Mr Tim Kelly and Professor Barry Brook
553 Ms Wendy Miller
554 Mr Simon & Ms Deb Chinner
555 Ms Vicki Brooke
556 Mr John Lloyd
557 Mr Ronald Rodenbaugh
558 Locals into Victoria Environment (LIVE)
559 Carbon Trade Watch, Transnational Institute
560 Mr Michael Nolan
561 Ms Zoe Rogers
562 Mr James H. Hawes & Mr Anthony J. Hawes
563 ZeroCarbon Network
564 Mr David Kirby
565 Emeritus ProfessorDavid C.B. Teather
566 Ms Gillian and Mr John Wells
567 Ms Naomi Beacham
568 Ms Gemma Tillack
569 Mr Ian Bowie
570 Ms Clare Whyte
571 ShadowLands website
572 Mr John Davidson
573 Mr Bob Foster
574 Australian Bureau of Statistics (ABS)
575 Climate Action Newcastle (CAN)
576 Ms Sarah Trethowan
577 Professor Ian White, Australian National University
578 Mums Kids & Climate
579 Dr Michael Raupach
580 Ms Gayle Adams
581 Australian ITER Forum
582 Ms Ann McGregor
583 Lighter Footprints Climate Action Group
584 Climate Change Our Future
585 South West Environment Centre
586 Ms Lisa Hodgson
587 Ms Rose Dow
588 Nancy & Tom Bevan
589 Building Designers Association of Australia
590 Ms Mitchell Porter
591 Mr Ben Rose
592 Mr Ross Miller
593 Professor Lee Godden, The University of Melbourne
594 Ms Marie Jamieson
595 Dr Mike Brisco
596 Grant Thornton
597 COOLmob
598 Ms Prue Acton
599 Australian Youth Climate Coalition
600 AGL
601 Consumer Utilities Advocacy Centre Ltd (CUAC)
602 Mr Rory Haymont
603 Mr David Tranter
604 Mr Ben Ewald
605 Ai Group
606 Mr Miles H Rider
607 Mr James Tonson
608 Mr Richard Corin
609 Mr Richard Bennett
610 Dr David Gill
611 Teys Group of Companies
612 Clean Energy for Eternity
613 Energy and Climate Services
614 Australian red meat industry
615 National Generators Forum
616 Dr Jack Pezzey, Australian National University
617 Foundation for Effective Markets and Governance
618 Mr Guy Abrahams
619 Local Government Association of SA
620 Ms Roslyn Woodward
621 Wesfarmers Limited
622 Greening Australia
623 Dr Desmond Griffin
624 EcoPerspectives
625 Energy Efficiency Council
626 Qenos Pty Ltd
627 Australian Property Institute, NSW Division
628 World Vision Australia
629 Energetics
630 CONFIDENTIAL
631 CONFIDENTIAL

632 NOWASTEVENTS
633 Xstrata Coal
634 Mr Brad Everson
635 Terri Van Wezel, Paul Van Wezel, Suzanne Piovesan, John Piovesan, Heidi Rurade, Penny Kleemann, Mike Penberthy, Jess Stanley
636 Ms Jill Greenwell
637 Live and Learn
638 Ms Rebecca Forbes
639 Mr Kieran Perkins
640 Mr Neil Fonseca
641 Mr Michael Loftus
642 Ms Kylie Riha-Jones
643 Mr John Evans
644 Mr Patrick Brownlee
645 Ms Noni Walker
646 Ms Sarah Neal
647 Ms Kathleen Wood
648 Ms Stefanie Butler
649 Ms Anne Ross
650 Ms Jessica Cameron
651 Ms Julie Stephen
652 Mr Mick Harewood
653 Dr Keith Armstrong
654 Shift Foundation
655 Mr Emmanuelle Emile- Blake
656 Ms Carolyn Ingvarson
657 Ms Tammy Driessen
658 Mr Paul Flood
659 Ms Helen Hill
660 Dr Bruce Robins
661 Ms Marie-Anne Lees
662 Ms Fiona Jury
663 Ms Amy Stebbing
664 D Faddoul
665 Ms Linda Shewan
666 Mr Paul Minty
667 Ms Alana Parrott Jolly
668 Mr Jim Heys
669 Ms Lissa Villeneuve
670 Mr Matthew Phillips
671 Mr Sebastian Welsh
672 Mr Stuart McConville
673 Kelsey Boreham
674 Ms Kim Grierson
675 Ms Fiona Crosskill
676 Ms Cassandra Rogers
677 Mr John Cribbes
678 Ms Miriam Strickland
679 Mr John Harvey
680 Ms Karen South
681 Ms Nicole Rodger
682 Mr Jim Norris
683 Mr Peter Dart
684 Mr John Carpenter
685 Mr Murray and Ms Joy Scott
686 Dr Valerie Yule
687 Mr Matthew Buckels
688 Ms Alison Leitch
689 Mr Sam Taylor
690 Ms Alison Clarke
691 Mr Charles Balnaves
692 Ms Sharon Hetzel
693 Dr Conor Jones
694 Ms Nikki Brown
695 Mr Peter Fell
696 Mr James Ray
697 Ms Emma Brooks Maher
698 Ms Jacqueline Hine
699 Ms Louise Jennison
700 Ms Patricia Phair
701 Mr Lucas Carter
702 Dr Alistair Sproul
703 Mr Grant Keady
704 Mr David Shearer
705 Mr Sanna Andrew
706 Ms Elise Jones
707 Ms Judy Whistler
708 Mr Robert Lengyel
709 Robin Bartrum & Carolyn Traill
710 Mr Philip Kidner
711 Mr Simon Hukin
712 Mr Alan Greenhalgh
713 Dr Martin Maguire
714 Ms Anne Platt
715 Dr Susan Britton
716 Mr Charlie Pascoe
717 Mr Jim Allen
718 Mr Alan Barron
719 Mr Bryan Clark
720 Mr Bob Baxt, Freehills
721 Mr Gary Ellett
722 Mr Darryl Hawke
723 Mr Alan Smith
724 Clean Energy for Eternity
725 Federal Chamber of Automotive Industries
726 Mr Tom Moore
727 Mr R V Barbero
728 Chamber of Commerce and Industry Queensland
729 Plastics and Chemicals Industries Association (PACIA)
730 Caltex Australia Limited
731 Mr Nishan Disanayake

732	Szencorp	754	Mr Harry Johnson
733	Mr Allen Horrell	755	National Association of Forest Industries
734	Mineral Holdings Australia Pty Ltd	756	Infrastructure Partnerships Australia (IPA)
735	Mr Warwick Povey	757	Australian Local Government Association (ALGA)
736	South Australian Government	758	Mr Philip Clark
737	CONFIDENTIAL	759	Dr Andrew McIntosh, Australian National University
738	Mrs V D Burnett	760	Sustainable Energy Policy Qld group
739	M Campbell	761	Green Building Council Australia
740	Mr Bruce Loder	762	Mr John Martin, Docklands Science Park
741	Ms Samantha Pearson	763	Mr Kelvin T Jones
742	Mr Bill Probst	764	Dr Graeme Pearman
743	Mr Gianni Frigo	765	Dr. Syd Shea, University of Notre Dame
744	WITHHELD	766	Mr Ray Soper
745	ECF Engineering	767	Penrice Soda Products Pty Ltd
746	Stacey & Rick Taylor	768	Sarah Spurrett
747	Mr Julian Wearne	769	Terry Croft
748	Mr W. Hermann Gfeller	770	Terrence Dwyer
749	Ms Margaret Maguire	771	Harry Elliffe
750	Ms Magaret Blakers		
751	Professor Glenn Albrecht, Murdoch University		
752	Associate Professor Brad Pettit, Murdoch University		
753	Mr Nick Pastalatzis		

Form letters

Correspondence received as a form letter with additional submitter comments: 951 submitters

Correspondence received as a form letter: 219 submitters

Correspondence received as a form letter: 109 submitters

Correspondence received as a form letter: 3475 submitters

Correspondence received as a form letter: 25 submitters

Correspondence received as a form letter: 63 submitters

Approximately 2400 additional submissions were received from individuals after the submission closing date. They are published on the Committee's website but have not been individually listed.

Additional Information Received

- Received on 30 April 2009, from Mr Greg Evans, Australian Chamber of Commerce and Industry. Clarification of response to question answered on 30 April 2009;
- Received on 1 May 2009, from Ms Ros DeGaris, National Lime Association of Australia. Answers to questions taken on notice on 21 April 2009;
- Received on 1 May 2009, from Mr Peter Morris, Australian Coal Association. Powerpoint presentation presented on 30 April 2009;
- Received on 7 May 2009, from Mr Chris Mitchell, Executive Director Corporate Development, CO2 Group. Answers to questions taken on notice on 16 April 2009;
- Received on 7 May 2009, from Ms Marghanita Johnson, Manager Climate Climate, Rio Tinto Alcan. Answers to questions taken on notice on 28 April 2009;
- Received on 12 May 2009, from the Department of the Treasury. Answers to questions taken on notice on 30 April 2009;
- Received on 13 May 2009, from Mr Peter Stark, ERM Power Pty Ltd. Answers to questions taken on notice on 28 April 2009;
- Received on 13 May 2009, from Mr Rob Cole, Woodside Energy Ltd. Answers to questions taken on notice on 28 April 2009 (including attachments);
- Received on 13 May 2009, from World Wildlife Fund. Documents provided after appearing at a public hearing on 1 May 2009;
- Received on 15 May 2009, from the Department of Climate Change. Answers to questions taken on notice on 1 May 2009;
- Received on 18 May 2009, from the Griffin Group. Answers to questions taken on notice on 20 April 2009;
- Received on 18 May 2009. from Perdaman Chemicals and Fertilisers. Confidential answers to questions taken on notice on 1 May 2009;
- Received on 18 May 2009, from Minerals Coucil of Australia. Answers to questions taken on notice on 28 April 2009;
- Received on 18 May 2009, from Anglo Coal Australia. Answers to questions taken on notice on 28 April 2009;
- Received on 19 May 2009, from National Generators Forum. Answers to questions taken on notice on 30 April 2009;
- Received on 21 May 2009, from Teys Bros. Answers to questions taken on notice on 28 April 2009;
- Received on 21 May 2009, from Elaine Prior, Citi Investment. Answers taken to questions on notice on 20 May 2009;
- Received on 22 May 2009, from Bega Cheese. Answers to questions taken on notice on 20 May 2009;
- Received on 26 May 2009, from Dr Regina Betz, Additional Action Reserve. Additional information provided after appearing at a public hearing on 1 May 2009;

- Received on 26 May 2009, from Bega Cheese. Answers to questions taken on notice on 20 May 2009;
- Received on 27 May 2009, from Pacific Hydro. Answers to questions taken on notice on 30 April 2009;
- Received on 29 May 2009, from Mr John Connor, the Climate Institute. Answers to questions taken on notice on 1 May 2009 (including attachments);
- Received on 29 May 2009, from Mr Brian Fisher. Answers to questions taken on notice on 20 May 2009;
- Received on 29 May 2009, from Ms Maria Atkinson, Lend Lease Corporation. Answers to questions taken on notice on 30 April 2009;
- Received on 29 May 2009, from ConocoPhilips Australia. Answers to questions taken on notice on 28 April 2009;
- Received on 30 May 2009, from Dr James Risbey. Answers to questions taken on notice on 23 April 2009;
- Received on 12 June 2009, from the Australian Conservation Foundation. Answers to questions taken on notice on 22 April 2009;
- Received on 12 June 2009, from the Australian Conservation Foundation. Answers to questions taken on notice on 20 May 2009;
- Received on 12 June 2009, from the Energy Supply Association of Australia. Answers to questions taken on notice on 28 April 2009.

TABLED DOCUMENTS

15 April 2009, CANBERRA ACT:

- Professor Robert Carter, James Cook University, '*Some recent estimates of the costs associated with green power and emissions trading legislation*', and attached graphs;
- Mr Geoff Carmody, Geoff Carmody and Associates, '*Why are we shuffling the deck chairs, not steering the ship?*', April 2009.

16 April 2009, CANBERRA ACT:

- Fenner School of Environment and Society, Australian National University, '*Green Carbon: The role of natural forests in carbon storage – Part 1*', 2008;
- Dr John Pezzey, Fenner School of Environment and Society, Australian National University, '*Structure of Australian economy, employment and greenhouse emissions in 2006*';
- Australian Bureau of Agriculture and Resource Economics, '*Agriculture and the CPRS: 2010*';
- Australian Bureau of Agriculture and Resource Economics, '*Key ABARE climate change publications, by broad theme/issue*';

- Australian Bureau of Agriculture and Resource Economics, '*ABARE climate change publications, by year of publication*';
- Australian Bureau of Agriculture and Resource Economics, '*Agriculture and the Carbon Pollution Reduction Scheme (CPRS): economic issues and implications*', March 2009;
- Australian Bureau of Agriculture and Resource Economics, '*Opportunities for forestry under the Carbon Pollution Reduction Scheme (CPRS): An examination of some key factors*', March 2009;
- Professor Ross Garnaut, University of Melbourne, '*Climate change and the great crash of 2008 - paper presented at the CSIRO Greenhouse 2009 Conference*', March 2009;
- Professor Ross Garnaut, University of Melbourne, '*Climate change and the Australian Agricultural and Resource Industries*', February 2009;
- Professor Ross Garnaut, University of Melbourne, opening statement for evidence given at the public hearing;
- Mr Peter Cosier, Wentworth Group of Concerned Scientists, '*Australian Economic Growth 1800AD to 2100AD*'.

21 April 2009, SYDNEY NSW:

- Centre of Full Employment and Equity, '*Policy Report – A Just Transition to a Renewable Energy Economy in the Hunter Region, Australia*', June 2008;
- Greenpeace Australia Pacific, '*Energy Revolution – A sustainable Australia energy outlook*', June 2008;
- Greenpeace Australia Pacific, '*Preserving Paradise: The value of protecting Papua New Guinea's forests for climate*', 2008.

22 April 2009, MELBOURNE VIC:

- Mr Max Spedding, Australian Landfill Owners Association, interpretation of White paper, February 2009;
- Australian Manufacturing Workers' Union, '*Making our future: Just transitions for climate change mitigation*'.

23 April 2009, HOBART TAS:

- Forestry Tasmania, '*Forest Management Plan 2008 – sustainability charter*', 2008;
- Forestry Tasmania, '*Sustainable forest management – 2008 report*', 2008;
- Forestry Tasmania, FT Carbon Management Policy summary;
- Forestry Tasmania, Forest, Product and Substitution Pools graph;
- Forest and Forest Industry Council, '*Global Climate Change and the Tasmanian Forest Products Sector – Final Report*', March 2009.

28 April 2009, BRISBANE QLD:

- Woodside Energy Ltd, questions and answers on climate change;
- Macquarie Research Equities, '*Energy Developments: Future in the hands of the government*', February 2009;
- Energy Developments Ltd, '*Energy for a Changing World – Annual Report 2008*', 2008;
- Energy Developments LTD, '*Commercial Opinion on Clean Energy Investments 2005 to 2007*', 2009;
- Gladstone Regional Council, notes taken by Mayor Cr. George Creed for information, April 2009;
- Mr Trevor St Baker, ERM Power, '*Electricity price rises by country/region*', 2009.

30 April 2009, CANBERRA ACT:

- Australian Coal Association, '*Emissions Trading – risks to jobs, regional economies and investment in the Australian Coal Industry*' (Power Point presentation), April 2009.

1 May 2009, CANBERRA ACT:

- Dr Martin Parkinson, Department of Climate Change, correspondence from Australian Energy Regulator, Australian Energy Markey Commission and National Electricity Market Management Company Ltd;
- Green Institute, '*Australia's 2006 UNFCCC greenhouse accounts*', April 2009;
- Green Institute, UNEP SBCI Climate Change Think Tank: Merged Draft '*Call for Action on Buildings and Climate Change*', 2009.

APPENDIX 2

Public Hearings and Witnesses

CANBERRA, WEDNEDAY 15 APRIL 2009

- CARMODY, Mr Geoff,
  Private capacity
- CARTER, Professor Robert Merlin,
  Private capacity
- COSIER, Mr Peter, Director,
  Wentworth Group of Concerned Scientists
- DENNISS, Dr Richard, Executive Director,
  Australia Institute
- FARGHER, Mr Ben, Chief Executive Officer,
  National Farmers Federation
- FRANKS, Professor Stewart William,
  Private capacity
- HITCHENS, Mr Michael, Chief Executive Officer,
  Australian Industry Greenhouse Network
- KAROLY, Professor David,
  Wentworth Group of Concerned Scientists
- MACINTOSH, Mr Andrew Kerr, Associate Director,
  ANU Centre for Climate Law and Policy
- MAZOUZ, Mr Salim, Private capacity
- McELHONE, Mr Charles, Manager,
  Trade Policy and Economics, National Farmers Federation
- PEARCE, Mr David, Executive Director,
  Centre for International Economics
- PEARMAN, Dr Graeme,
  Private capacity
- RAUPACH, Dr Michael,
  Private capacity
- STEFFEN, Professor Will,
  Private capacity
- WAIN, Ms Fiona, Chief Executive Officer,
  Environment Business Australia

CANBERRA, THURSDAY 16 APRIL 2009

- AHAMMAD, Dr Helal, Branch Manager, Climate Change,
  Department of Agriculture, Fisheries and Forestry
- AJANI, Dr Judith Ingrouille, Economist,
  Fenner School of Environment and Society, Australian National University
- BRECKENRIDGE, Mr Amar, consultant,
  Frontier Economics
- BROCKWAY, Dr David John, Chief, Division of Energy Technology,
  CSIRO
- CLARK, Mr Bryan, Industry Development Manager,
  Grain Growers Association
- COSIER, Mr Peter, Director,
  Wentworth Group of Concerned Scientists
- GARNAUT, Prof. Ross Gregory,
  Private capacity
- GIBBS, Mr Mark, General Manager, Climate Change,
  Department of Agriculture, Fisheries and Forestry
- GLYDE, Mr Phillip, Executive Director,
  Australian Bureau of Agricultural and Resource Economics
- GRANT, Mr Andrew, Chief Executive Officer,
  C02 Group Ltd
- HARRIS, Mr Matt, consultant,
  Frontier Economics
- HEYHOE, Ms Edwina, Section Manager, Climate Change,
  Australian Bureau of Agricultural and Resource Economies
- JONES, Dr Christine Ellen, Founder,
  Australian Soil Carbon Accreditation Scheme
- KEITH, Dr Heather,
  Private capacity
- McKIBBIN, Prof. Warwick James,
  Private capacity
- MITCHELL, Dr Christopher David, Executive Director, Corporate
  Development, CO2 Group Ltd
- PEARCE, Mr David, Executive Director,
  Centre for International Economics
- PEZZEY, Dr John (Jack),
  Private capacity
- TAUBENSCHLAG, Ms Tara, Communications Advisor,
  Grains Council of Australia Ltd

PERTH, MONDAY 20 APRIL 2009

- ALBRECHT, Professor Glenn, Director, Institute for Sustainability and Technology Policy, Murdoch University
- BOYCE, Ms Karen, Chair, Climate Change Committee, Chamber of Commerce and Industry of Western Australia
- CANION, Mr Andrew, Senior Adviser, Industry Policy, Chamber of Commerce and Industry of Western Australia
- CREMIN, Mr Shane, General Manager, Policy and Strategy, Griffin Energy
- HANLIN, Mr Timothy John, Managing Director, Australian Climate Exchange Limited
- HILL, Mr Alan, Director of Policy, Western Australian Farmers Federation Inc
- HOFMEESTER, Ms Carolyn Marie, Climate Change Policy Officer, Conservation Council of Western Australia
- KIRCZENOW, Dr Irene, Doctors for the Environment Australia
- McMILLAN, Mr Andy, Chief Executive Officer, Western Australian Farmers Federation Inc
- NORTON, Mr Mike, President, Western Australian Farmers Federation Inc
- PARK, Mr Dale, Land Management and Climate Change Spokesperson, Western Australian Farmers Federation Inc
- PETTITT, Associate Professor Bradley, Dean, School of Sustainability, Murdoch University
- TRUMBLE, Mr Wayne, Executive General Manager, Griffin Energy
- VERSTEGEN, Mr Piers, Director, Conservation Council of Western Australia
- WILLS, Dr Raymond Thomas, Chief Executive, Western Australian Sustainable Energy Association Inc

SYDNEY, TUESDAY 21 APRIL 2009

- BENNETT, Ms Polly, Manager, Government Affairs,
  Caltex Australia Ltd
- DeGARIS, Mrs Ros, Chief Executive Officer,
  National Lime Association of Australia
- DENT, Ms Kelly Eliza, Economic Justice Team Lead,
  Oxfam Australia
- HAMILL, Dr David John, Chairman of the Board,
  Envirogen Pty Ltd
- HARRUP, Ms Trish, Senior Climate Campaigner,
  Greenpeace Australia Pacific
- HEPBURN, Mr John, Climate Change Campaign Coordinator,
  Greenpeace Australia Pacific
- KEOGH, Mr Michael John, Executive Director,
  Australian Farm Institute
- NELSON, Mr Tim, Head, Carbon Origination and Government Affairs,
  AGL
- RICE, Mr Jeffrey William, Chief Executive Officer,
  Envirogen Pty Ltd
- RICHARDS, Ms Julie-Anne, Climate Change Advocacy Coordinator,
  Oxfam Australia
- ROWLEY, Mr Nicholas Hugo, Director,
  Kinesis
- SIMSHAUSER, Dr Paul, Chief Economist and Group Head,
  Corporate Affairs, AGL
- TAPER, Mr Bruce Stewart, Director,
  Kinesis
- TOPHAM, Mr Frank, Manager, Government Affairs and Media,
  Caltex Australia Ltd
- van ROOYEN, Mr Jonathan, Director,
  Envirogen Pty Ltd
- WESTMORE, Mr Anthony Ian (Tony), Senior Policy Officer - Electricity,
  Australian Council of Social Service
- WINN, Mr Paul, Forest Climate Policy Expert,
  Greenpeace Australia Pacific

HOBART, THURSDAY 23 APRIL 2009

- ALLISON, Dr Ian, Program Leader, Ice, Ocean, Atmosphere and Climate, Australian Antarctic Division, Department of the Environment, Water, Heritage and the Arts
- CAULEY, Mr Ivan Dudley, Global Manager, Business Improvement, Nyrstar
- DICKENSON, Mr Ian, Chairman, Private Forests Tasmania
- DRIELSMA, Dr Johannes (Hans), Executive General Manager, Forestry Tasmania
- FLITTNER, Mr Nick, Drought and Climate Change, Tasmanian Farmers and Graziers Association
- GUNN, Mr John, Chief Scientist, Australian Antarctic Division, Department of the Environment, Water, Heritage and the Arts
- HICKS, Mr David William, Performance Manager, Norske Skog Paper Mills (Australia) Ltd
- HUNTER, Dr John Robert, Sea-Level Oceanographer, Antarctic Climate and Ecosystems Cooperative Research Centre
- JEFFREYS, Mr Kenneth (Ken), General Manager, Corporate Relations and Tourism, Forestry Tasmania
- LAUGHER, Mr John Thomas, Performance Manager, Norske Skog Paper Mills (Australia) Ltd
- LORD, Mr John, Private capacity
- MATEAR, Dr Richard, Private capacity
- PRESS, Dr Tony, Chief Executive Officer, Antarctic Climate and Ecosystems Cooperative Research Centre
- PULLINGER, Dr Phillip, Director, Environment Tasmania
- RIDDLE, Dr Martin, Program Leader, Environment Protection and Change, Australian Antarctic Division, Department of the Environment, Water, Heritage and the Arts
- RISBEY, Dr James Sydney, Private capacity
- STONE, Mr Martin, Manager, Resources, Forestry Tasmania
- STRIE, Mr Frank, Regional Consultant, Tasmania, BEST Energies Australia Pty Ltd; and Director, Schwabenforest Pty Ltd

- TAYLOR, Mr Peter, Senior Forester,
  Private Forests Tasmania
- TERWINGHE, Dr Francis, General Manager, Hobart,
  Nyrstar
- WRIGHT, Miss Jessica, Climate Campaigner/Coordinator,
  Environment Tasmania
- ZOOEFF, Mr Greg, Senior Business Analyst,
  Nyrstar

BRISBANE, TUESDAY 28 APRIL 2009

- COETZER, Mr Ben, General Manager, Domestic Gas,
  Woodside Energy Ltd
- COLE, Mr Robert, Executive Vice President, Corporate, and General Counsel,
  Woodside Energy Ltd
- CONCANNON, Mr Anthony, Chairman,
  Energy Supply Association of Australia
- CREED, Councillor George Albert, Mayor,
  Gladstone Regional Council
- DOHERTY, Mr Ronald John, Director, Environment and Regulation,
  Gladstone Regional Council
- FRENCH, Mr Seamus, Chief Executive, Anglo Coal Australia
- GRAZIA, Mr Niegel, Vice President, Government Affairs,
  Woodside Energy Ltd
- HODGSON, Mr Steve, President and Chief Executive Officer, Bauxite and Alumina, Rio Tinto Alcan
- HOUSE, Mr Jeffrey Craig, National Policy and Public Affairs Manager,
  Green Building Council of Australia
- JOHNSTON, Ms Susan, Special Adviser, Policy,
  Anglo Coal Australia
- LIU, Dr Xiaoling, President, Primary Metals Pacific,
  Rio Tinto Alcan
- MADEW, Ms Romilly, Chief Executive,
  Green Building Council of Australia
- MARSHMAN, Mr Neil, Chief Consultant, Climate Change,
  Rio Tinto
- MARUSHACK, Mr Joe, President,
  ConocoPhillips Australia Pty Ltd
- MOLONY, Councillor John, Mayor,
  Mount Isa City Council
- NICHOLLS, Ms Fiona, General Manager, External Relations,
  Rio Tinto Coal Australia
- QUIGGIN, Professor John,
  Private capacity
- SAVAGE, Ms Clare, Chief Executive Officer,
  Energy Supply Association of Australia

- ST BAKER, Mr Trevor Charles, Executive Chairman,
  ERM Power Pty Ltd
- STARK, Mr Peter Matthew, Head of Carbon,
  ERM Power Pty Ltd
- TATE, Mr John,
  Private capacity
- TEYS, Mr Bradley Allan, Chief Executive Officer,
  Teys Bros (Holdings) Pty Ltd

CANBERRA, THURSDAY 30 APRIL 2009

- ATKINSON, Ms Maria Louise, Global Head of Sustainability, Lend Lease Corporation
- BAGHAEI, Mr Ali, Chief Executive Officer, Oceanlinx
- BAIN, Ms Robyn, Chief Executive Officer, Cement Industry Federation
- BEASLEY, Mr Burt, Director, Technology and Innovation, Australian Coal Association
- BLAKERS, Professor Andrew, Director, ARC Centre for Solar Energy Systems, Australian National University
- BLANEY, Mr Conrad Dallas, Technical Manager, Australian Meat Industry Council
- BURGESS, Mr Allan, Chairman, Australian Dairy Industry Council
- BURGESS, Mr Peter, Rainbow Bee Eater Pty Ltd
- CAMERON, Mr Jonathon (James), Climate Change Capital
- CLARK, Mr Bryan, Industry Development Manager, Grain Growers Association
- CONCANNON, Mr Tony, Executive Director, International Power Australia, National Generators Forum
- COSTELLO, Mr Michael, Chief Executive Officer, ActewAGL
- EVANS, Mr Greg, Director, Economics and Industry Policy, Australian Chamber of Commerce and Industry
- FARLOW, Mr Andrew, Sustainability Policy Manager, Cement Industry Federation
- GORDON, Mr Bob, Executive Director, Renewable Fuels Australia
- GUNTHER, Mr Brent James, Managing Director, InterGen (Australia) Pty Ltd
- HENDY, Mr Barry, Business Development Manager, Solar Systems Pty Ltd
- HILLMAN, Mr Ralph, Executive Director, Australian Coal Association
- In'tVELD, Ms Shirley, Member, National Generators Forum

- JEANES, Ms Susan, Chief Executive Officer,
  Australian Geothermal Energy Group
- KING, Mr Grant Alfred, Managing Director,
  Origin Energy
- LEON, Mr Chris, Chair,
  Cement Industry Federation
- MAGUIRE, Mr Thomas John, Chair, Industry Climate Change Committee,
  Australian Meat Industry Council
- MARIES, Ms Claire, Policy Manager,
  Pacific Hydro
- McCAMISH, Mr Carl, Executive General Manager, Policy and Sustainability,
  Origin Energy
- McKENZIE, Ms Amanda, National Director,
  Australian Youth Climate Coalition
- MORRIS, Mr Peter, Economic Policy Director,
  Australian Coal Association
- O'HARA, Ms Dianne, General Manager, Business Strategy and
  Development, ActewAGL
- O'SULLIVAN, Mr Michael, President,
  Australian Council of Superannuation Investors
- POOLE, Mr Robert Arthur, Board Member,
  Australian Dairy Industry Council
- QUINN, Ms Meghan Elizabeth, Manager, Climate Change Modelling Unit,
  Treasury
- RICHARDS, Mr Andrew, Executive Manager, Government and Corporate
  Affairs, Pacific Hydro
- ROSE, Ms Anna, National Director,
  Australian Youth Climate Coalition
- SHEA, Professor Syd Ronald, Director Science,
  Rainbow Bee Eater Pty Ltd
- SQUIRES, Ms Meredith, Manager, Environmental and Social Responsibility,
  Australian Council of Superannuation Investors
- STANLEY, Mr Ian, Operations Manager,
  Rainbow Bee Eater Pty Ltd
- WALL, Mr Che Shiva, Managing Director,
  Lincolne Scott
- WARREN, Mr Matthew, Chief Executive Officer,
  Clean Energy Council of Australia

CANBERRA, FRIDAY 1 MAY 2009

- BAMSEY, Mr Howard, Deputy Secretary and Special Envoy, Department of Climate Change
- BETZ, Dr Regina Annette, Joint Director (Economics), Centre for Energy and Environmental Markets, University of New South Wales
- BLAKERS, Ms Margaret, Director, Green Institute
- CARRUTHERS, Mr Ian, First Assistant Secretary, Adaptation and Land Management Division, Department of Climate Change
- COMLEY, Mr Blair, Deputy Secretary, Department of Climate Change
- FRENCH, Mr Steve, General Manager, Industry, Environment and Defence Division, Department of the Treasury
- HATFIELD-DODDS, Dr Steve, Assistant Secretary, Analysis Projects Branch, Department of Climate Change
- ISON, Mr Michael Ronald John, Manager, Policy and Research, Australian Aluminium Council
- JACKSON, Mr Erwin Kenneth, Director, Policy and Research, The Climate Institute
- LAURIE, Ms Kirsty, Senior Adviser, Energy and Greenhouse Policy Unit, Industry, Environment and Defence Division, Department of the Treasury
- LYONS, Ms Elizabeth (Libby), Manager, Government Relations and Public Policy, Alcoa of Australia
- MacGILL, Dr Iain Ferguson, Joint Director (Engineering), Centre for Energy and Environmental Markets, University of New South Wales
- MALLON, Dr Karl, Consultant, World Wildlife Fund Australia
- McAULIFFE, Mr Timothy, Manager, Environment and Sustainable Development, Alcoa of Australia
- OWEN-JONES, Mr Robert Anton, Assistant Secretary, Multilateral Negotiations Branch, Department of Climate Change
- PROSSER, Mr Miles, Executive Director, Australian Aluminium Council
- QUINN, Ms Meghan, Manager, Climate Change Modelling Unit, Industry, Environment and Defence Division, Department of the Treasury
- RICHARDS, Dr Gary Phillip, Senior Principal Research Scientist and Branch Head, Land Management Branch, Department of Climate Change

- TONI, Mr Paul David, Program Leader, Sustainable Development and Climate Change, World Wildlife Fund Australia
- WALLER, Mr Gerard Thomas, Manager, Business Improvement, Alcoa Australia Rolled Products

CANBERRA, WEDNESDAY 20 MAY 2009

- AMAIR, Mr Elvis, Technical Services Manager,
  Bega Cheese Ltd
- AYRES, Mr Timothy, Assistant State Secretary, New South Wales Branch,
  Australian Manufacturing Workers Union
- BURN, Dr Peter, Associate Director, Public Policy,
  Australian Industry Group
- COETZER, Mr Ben, General Manager, Domestic Gas,
  Woodside Energy Ltd
- COLE, Mr Robert, Executive Vice President, Corporate Centre and General Counsel, Woodside Energy Ltd
- COMLEY, Mr Blair Robert, Deputy Secretary,
  Department of Climate Change
- CONNOR, Mr John, Chief Executive Officer,
  The Climate Institute
- DENNISS, Dr Richard, Executive Director,
  The Australia Institute
- FABIAN, Mr Nathan, Chief Executive Officer,
  Investor Group on Climate Change
- FISHER, Dr Brian,
  Private capacity
- FRENCH, Mr Steve, General Manager, Industry, Environment and Defence Division, Department of the Treasury
- GILMORE, Ms Heather, Senior Manager, Government and Industry Affairs, Westpac
- HANSARD, Mr Allan, Chief Executive Officer,
  National Association of Forestry Industries
- HEPBURN, Mr John, Coordinator, Climate and Energy Campaign,
  Greenpeace Australia Pacific
- HERD, Ms Emma, Director, Emissions and Environment,
  Westpac
- HILLMAN, Mr Ralph, Executive Director,
  Australian Coal Association
- HORVAT, Ms Natalie, Manager, Climate Change and Environment Unit, Department of the Treasury
- HOWES, Professor Stephen,
  Private capacity
- LAWSON, Mr Damien, National Climate Justice Coordinator, Friends of the Earth Australia

- MALLON, Dr Karl Joseph, Director, Corporate Analysis,
  Climate Risk Pty Ltd
- MARSH, Mr Russell, Policy Manager,
  Clean Energy Council
- MAZOUZ, Mr Salim, Director,
  EcoPerspectives
- McCREA, Mr Glen James, Manager, Indirect Tax Unit,
  Department of the Treasury
- McELHONE, Mr Charles, Manager, Economics and Trade,
  National Farmers Federation
- McKENZIE, Ms Amanda, Co-Director,
  Australian Youth Climate Coalition
- PARRIS, Dr Brett, Chief Economist,
  World Vision Australia
- PASCOE, Mr Owen, Climate Change Campaigner,
  Australian Conservation Foundation
- PRIOR, Ms Elaine Margaret, Director and Senior Analyst,
  Citi Investment Research
- QUINN, Ms Meghan Elizabeth, Manager, Climate Change Modelling Unit,
  Department of the Treasury
- ROBINSON, Ms Belinda,
  Australian Petroleum Production and Exploration Association
- SAKELLARIS, Mr Tas, Assistant Secretary, Legislation and Governance
  Branch, Department of Climate Change
- SAVAGE, Ms Clare, Chief Executive Officer,
  Energy Supply Association of Australia
- St BAKER, Mr Trevor, Executive Chairman,
  ERM Power Pty Ltd
- SUTTON, Mr Philip David, Assistant Convenor,
  Climate Emergency Network
- TAGER, Mr Jeremy, Team Leader, Political Unit,
  Greenpeace Australia Pacific
- TEYS, Mr Bradley Allan, Chief Executive Officer,
  Teys Bros (Holdings) Pty Ltd
- TOPHAM, Mr Frank, Manager, Government Affairs and Media,
  Caltex Australia Ltd
- WESTMORE, Mr Anthony (Tony) Ian, Senior Policy Officer (Electricity),
  Australian Council of Social Service