

Addressing climate change

Introduction

- 3.1 Having found that we need to stabilise concentrations of greenhouse gases in the atmosphere by 450 parts per million, it is necessary to establish what this means in terms of reductions in greenhouse gas emissions, and how to share the responsibility for reductions across nation states.
- 3.2 This chapter examines mechanisms for reaching the stabilisation target of 450 parts per million of carbon dioxide equivalent greenhouse gases in the atmosphere (referred to as 'parts per million' from here on) which the scientific evidence suggests is necessary to avoid serious climatic disruption.
- 3.3 In particular, this chapter will address:
 - the level of emissions reductions necessary to reach the target for greenhouse gas stabilisation at 450 parts per million;
 - the distribution of responsibility for emissions reduction across nation states; and
 - what mechanism should be adopted to reduce greenhouse gas emissions.
- 3.4 The chapter concludes with the Committee's view of the position the Australian Government should take to the 15th Conference of the Parties to the United Nations Framework Convention on Climate Change in Copenhagen, Denmark.

- 3.5 In dealing with greenhouse gas emissions, Australia is faced with a choice, firstly as to the target to work towards for emissions stabilisation, and secondly, the mechanism for reaching that target. The direction taken by Australia will be guided by judgements about how Australia can best influence global attitudes and decisions.¹

Emissions reductions target

- 3.6 In the previous chapter, the Committee concluded that the scientific evidence points to a greenhouse gas stabilisation target of 450 parts per million as necessary to avoid serious climate disruption. The choice of this target for stabilisation shapes much of the rest of the policy analysis and discussion.²
- 3.7 An additional consideration in determining the acceptable flow of greenhouse gas emissions is the evidence for greenhouse gas emissions and climate change that has emerged since the climate modelling on which the discussion in chapter two was based.
- 3.8 The climate modelling in chapter two is based on climate data from the 1990s, published originally in the Intergovernmental Panel on Climate Change's Special Report on Emissions Scenarios (IPCC SRES). Evidence gathered since this modelling was conducted indicates that both the modelling of greenhouse gas emissions and temperature increases was conservative.
- 3.9 Between 1990 and 1999, greenhouse gas emissions increased at 1.1 percent per year on average. Between 2000 and 2004, emissions of greenhouse gas increased an average three percent a year.³ More recent audits of carbon emissions indicate this higher level of emissions has continued into the second half of the 2000s.⁴ In addition, world average temperatures have increased at a rate higher than the highest temperature increase modelled by SRES.⁵

1 Enting, I. Karoly, D. Falk, J. Clisby, N. Bodman, R. and Settle, D., *The science of stabilising greenhouse gas concentrations: A commissioned report for the Garnaut climate change review*, 2008, pp. 34-35.

2 Stern, N. "The economics of climate change," *American economic review*, 98(2), May 2008, p. 2.

3 Climate Institute, *Evidence of accelerated climate change*, 2007, p. 3.

4 Global Carbon Project, *Carbon trends 2007, 2008*, p. 1.

5 Climate Institute, *Evidence of accelerated climate change*, 2007, p. 3.

- 3.10 The *Stern review on the economics of climate change*, conducted for the UK Treasury, was criticised for using models with a higher range of greenhouse gas emissions to reach a conclusion that the greenhouse gas stabilisation target should be less than 550 parts per million.⁶ However, as Lord Stern has recently pointed out, the modelling used in his review underestimated the actual level of emissions now occurring.⁷
- 3.11 Modelling undertaken by Professor Garnaut on the more recent greenhouse gas emissions evidence indicates that emissions from fossil fuels alone will be eight percent higher than predicted by SRES by 2015, and 34 percent higher by 2030.⁸
- 3.12 In determining what level of emissions reductions is necessary to reach a stabilisation target of 450 parts per million, it is necessary to understand that the carbon cycle discussed in chapter two can take up to 100 years to reach stabilisation. This means that emissions now can have an impact on the level of greenhouse gases in the atmosphere for up to 100 years.⁹
- 3.13 To date, there has been enough greenhouse gases emitted to exceed the stabilisation target of 450 parts per million. In order to reach a stabilisation target of 450 parts per million, the concentration of greenhouse gases in the atmosphere will have to peak and then decline. The lower the desired greenhouse gas stabilisation level, the faster emissions will have to be reduced.¹⁰
- 3.14 Mitigation efforts to 2030 face a shrinking window of opportunity to contain emissions and achieve stabilisation below a level regarded as dangerous.
- 3.15 Having regard to this, the Committee now turns to what level of emissions reduction is necessary to achieve a stabilisation target of 450 parts per million.
- 3.16 In 2000, global emissions of greenhouse gases amounted to the equivalent of 42 gigatonnes of carbon dioxide annually.¹¹ Lord Stern predicted that, with a business as usual scenario, this would increase to the equivalent of
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6 Garnaut, G. Howes, S. Jotzo, F. and Sheehan, P., *Emissions in the platinum age: The implications of rapid development for climate change mitigation*, 2008, p. 17.

7 Stern, N., "The economics of climate change," *American economic review*, 98(2), May 2008, p. 2

8 Garnaut, G. Howes, S. Jotzo, F. and Sheehan, P., *Emissions in the platinum age: The implications of rapid development for climate change mitigation*, 2008, p. 17.

9 Garnaut, R., *The Garnaut climate change review*, 2008, p. 42.

10 Enting, I. Karoly, D. Falk, J. Clisby, N. Bodman, R. and Settle, D., *The science of stabilising greenhouse gas concentrations: A commissioned report for the Garnaut climate change review*, 2008, p. 26.

11 A gigatonne is one billion tonnes.

82 gigatonnes of carbon dioxide emissions annually by 2050.¹² An emissions target of 450 parts per million would require emissions to be reduced to the equivalent of 12 gigatonnes of carbon dioxide annually by 2050. This is a reduction of 70 gigatonnes from the business as usual scenario, and a reduction of 30 gigatonnes over current emissions levels.¹³ In percentage terms, this amounts to an international emissions reduction of between 60 and 80 percent by 2050.¹⁴

- 3.17 No single nation, or group of nations, is capable of reducing emissions sufficiently to meet this target. Emissions reductions of this magnitude can only be achieved through a comprehensive international agreement.

Distribution of emissions reduction responsibilities

- 3.18 One of the most significant issues facing the international community is how to distribute responsibility for emissions reductions amongst nation states. How global targets are allocated between nations will determine Australia's national emissions target.¹⁵
- 3.19 The current level of emissions varies considerably between nation states. Two factors determine the level of emissions by nation states – their level of economic activity and their population size. The bulk of greenhouse gas emissions arise from the countries at the centre of global economic activity. The largest emitters are China, the United States and the European Union, which between them are responsible for more than 40 percent of global emissions. The 20 largest emitters are responsible for more than 80 percent of global emissions.¹⁶
- 3.20 Richer countries tend to have much higher per capita emissions than poorer countries. The exceptions are poorer countries with high emissions from land-use change and forestry. Developed and transitional countries produce about half of current global emissions. However, the growth of emissions is much faster in developing countries, and their share of global emissions will grow over time.¹⁷

12 Stern, N., "The economics of climate change," *American economic review*, 98(2), May 2008, p. 3.

13 HM Treasury, *Stern review on the economics of climate change*, 2006, p. 233.

14 IPCC, *Climate change 2007: Synthesis Report*, 2008, p. 67.

15 Enting, I. Karoly, D. Falk, J. Clisby, N. Bodman, R. and Settle, D., *The science of stabilising greenhouse gas concentrations: A commissioned report for the Garnaut climate change review*, 2008, p. 70.

16 Garnaut, R., *The Garnaut climate change review*, 2008, p. 54.

17 Garnaut, R., *The Garnaut climate change review*, 2008, p. 54.

- 3.21 The most recent approach to distributing responsibility between nation states is the Kyoto Protocol. Signatory nations to the Kyoto Protocol could commit to reducing emissions to a certain level above or below that nation's 1990 emissions. Differentiation between emissions targets by countries was negotiated on an ad hoc basis, with little reference to underlying principles for allocation across countries. On average, richer countries agreed to larger reductions.¹⁸

Australia's emissions reductions target

- 3.22 The scientific evidence points to the need for an international agreement in order to reduce greenhouse gas emissions by between 60 and 80 percent by 2050.
- 3.23 Australia's overwhelming interest is in achieving an international agreement. The Committee believes the best approach to achieving an effective international agreement is to work in cooperation with nations that will drive international agreement.
- 3.24 During the United States Presidential election campaign, Barack Obama committed to reduce greenhouse gas emissions in the United States to 80 percent below 1990 levels by 2050.¹⁹
- 3.25 With the aim of achieving stabilisation of greenhouse gases at 450 parts per million, Australia should also be willing to adopt a policy setting to reduce Australia's emissions of greenhouse gases by 80 percent by 2050, in seeking agreement from other developed countries to also cut emissions by 80 percent by 2050.

18 Garnaut, R., *The Garnaut climate change review*, 2008, p. 201.

19 Obama, B. and Biden, J., *Promoting a healthy environment*, 2008, p. 1.

Recommendation 2

The Committee recommends that the Australian Government be willing to adopt a policy setting to reduce Australia's emissions of greenhouse gases by 80 percent by 2050 in seeking agreement from other developed countries to also cut emissions by 80 percent by 2050.

Reducing emissions

- 3.26 It is likely that any international agreement to reduce greenhouse gas emissions will also contain a mechanism to achieve this end. An internationally agreed mechanism for reducing emissions will be essential to the success of the agreement. A range of submissions to the inquiry strongly supported Australia's participation in an international market.²⁰
- 3.27 Two mechanisms are in serious contention. Both are market based mechanisms. Market based mechanisms seek to alter prices in a way that reflects the cost of emissions used to produce a good or service. Emissions can arise during the production and distribution process of a good or service. The more greenhouse gases are emitted, the higher the price of the good or service.
- 3.28 Consumers choose whether, when and how to change from high emission to low emission intensive products. As a consequence, firms begin investing in alternative technologies and new products.²¹
- 3.29 The mechanisms in serious contention are the carbon tax and the carbon market. Both methods have been shown to be effective ways of reducing pollution at a much lower cost than more traditional regulation.²²
- 3.30 Administratively, the simplest pricing mechanism is to impose a tax on emissions, typically known as a carbon tax. A carbon tax is a tax on the carbon content of fuels, effectively a tax on the carbon dioxide emissions from burning fossil fuels.²³
- 3.31 Carbon taxes are straightforward to apply and avoid the need for governments to take discretionary decisions about who ought to be

20 Insurance Council of Australia, *Submission No. 18*, p. 2; Australian Conservation Foundation, *Submission No. 20*, p. 2.

21 Garnaut, R., *The Garnaut climate change review*, 2008, p. 308.

22 Shrum, T., *Greenhouse gas emissions – Policy and economics*, 2007, p. 27.

23 Carbon Tax Centre, <http://www.carbontax.org/introduction/>, viewed on 9 February 2009.

allowed to emit. Carbon taxes also provide certainty about the marginal costs of mitigation.²⁴

- 3.32 Carbon taxes are considered to have a number of advantages. For example, carbon taxes will increase the price of energy by a predictable amount. This has a number of advantages, including price stability for consumers and easy modelling of the effects of its introduction. Unlike a carbon market, a carbon tax avoids the potential of extremely high permit prices causing debilitating compliance costs or extremely low permit prices creating insufficient incentive for emissions reductions.
- 3.33 A stable price signal puts steady pressure on the markets to determine the best pathway towards reduction and alternative energy development. When there is a clear, predictable price for greenhouse gas emissions, businesses can plan prudent investments in energy efficiency and have a transparent, long-term incentive for investments in research and development of new technologies.²⁵
- 3.34 Another advantage of a carbon tax is the immediacy with which it can be applied. A carbon tax would not require the extensive international regulatory framework that a carbon market will require. In an environment where early action will be rewarded, this may prove useful.
- 3.35 Finally, a carbon tax can be more equitable than the carbon market alternative discussed below, particularly if the carbon market is introduced with concessions to emissions intensive industries.²⁶
- 3.36 Nevertheless, a carbon tax cannot guarantee that emissions reductions targets can be met. In addition, with a focus on targets, the tax rate for carbon would have to be continuously monitored and changed to ensure emissions targets were met.²⁷
- 3.37 A carbon market works on the basis of the issue of emissions permits. Each permit represents a tradeable instrument with inherent value that can be exchanged between sellers and buyers in an emissions permit market. This enables the movement of permits within the economy to their most economically efficient use.
- 3.38 The permit enables the holder to emit a specified amount of greenhouse gas. Producers of goods and services are only able to emit the amount of

24 Garnaut, R., *The Garnaut climate change review* 2008, p. 308.

25 Shrum, T., *Greenhouse gas emissions – Policy and economics*, 2007, p. 27.

26 Carbon Tax Centre, <http://www.carbontax.org/introduction/>, viewed on 9 February 2009.

27 Garnaut, R., *The Garnaut climate change review*, 2008, p. 309.

- greenhouse gases they have permits for. The cost of the permit is passed on to the consumer.
- 3.39 The mechanism reduces greenhouse gas emissions in two ways. First of all, the amount of greenhouse gases specified in the permits is less than the amount of greenhouse gases that would be emitted under a business as usual scenario. Producers are therefore encouraged to reduce greenhouse gas emissions in the production process. Secondly, the additional cost of the permits is passed on to the consumer, encouraging the consumer to purchase goods and services produced with a more efficient use of greenhouse gases.²⁸
- 3.40 The principal benefit of the carbon market will be its effectiveness in implementing an international agreement to reduce greenhouse gas emissions. Carbon taxes can only be implemented at a national level. Differences between the tax approaches will mean that the price of carbon will vary across nations. The different carbon prices will reduce the effectiveness of the price signal a carbon tax is supposed to send. By contrast, a carbon market implemented as part of an international agreement will ensure that price signals are uniform world wide.
- 3.41 A further advantage will be that carbon reductions can occur in the most cost effective location. This will be of particular benefit to developing countries.
- 3.42 In a carbon market, there are a number of ways that governments in rich countries can drive flows, either through direct purchase of quotas allocated to developing countries or through the creation of company-level trading where companies have access to credits for emissions reductions created in developing countries. In this case, financial flows between sectors and/or countries can occur automatically as carbon emitters search for the most cost-effective way of reducing emissions.
- 3.43 In theory, both a carbon tax and carbon market could drive financial flows from the developed to developing countries. Under a tax-based system, revenues raised will in the first instance flow to national governments. An additional mechanism would need to be put in place to transfer resources to developing countries.²⁹

28 Garnaut, R., *The Garnaut climate change review*, 2008, p, 322.

29 HM Treasury, *Stern review on the economics of climate change*, 2006, p. 320.

Carbon tax or carbon market?

3.44 Both a carbon tax and a carbon market have advantages as mechanisms for reducing greenhouse gas emissions. Professor Garnaut had the following to say about each of these options:

A well-designed emissions trading scheme has important advantages over other forms of policy intervention. However, a carbon tax would be better than a heavily compromised emissions trading scheme.³⁰

3.45 Once again, the consideration underpinning the Committee's recommendation in relation to this issue is the overwhelming advantage to Australia of reaching an international agreement to reduce greenhouse gas emissions. An international carbon market will hold advantages for developing countries, and may be a crucial aspect to ensure their participation in an international agreement.

Recommendation 3

The Committee recommends that the Australian Government pursue the creation of an international carbon market as the primary mechanism for reducing greenhouse gas emissions.

Australia's position in Copenhagen

3.46 Professor Garnaut argued that, beyond the Kyoto Protocol, the Government should work with the international community to secure a global agreement around a firm emissions concentrations goal. He argued that Australia should commit to a comprehensive global agreement for four reasons:

- international agreement is urgent and essential;
- agreement is possible if Australia and some other countries attach enough importance to it;
- a comprehensive global agreement is the only way to remove the risks, to Australia and to the global trading system, of payments to trade-exposed, emissions-intensive industries; and

30 Garnaut, R., *The Garnaut climate change review*, 2008, p. 299.

- international agreement lowers the cost of Australian mitigation and so allows Australia to be more ambitious about the reduction in emissions.³¹
- 3.47 Professor Garnaut found, as the Committee has found, that Australia's long term interests lie in reaching an agreement to return greenhouse gas levels in the atmosphere to 450 parts per million. However, Professor Garnaut was concerned that the excessive cost of achieving this stabilisation target would make international agreement impossible. In the interests of reaching an international agreement, he argued that Australia should aim for agreement to a more modest target of stabilisation at 550 parts per million.³²
- 3.48 The Committee has approached the issue of climate change using scientific evidence. The advantages of this approach for clear, unambiguous guidance on this issue were discussed in chapter one. This will mean a different series of recommendations to those contained in the Garnaut Review. The scientific evidence indicates that a stabilisation target of 550 parts per million runs a high risk of significant climate disruption. As a consequence, the Committee has recommended that the Government seek an international stabilisation target of 450 parts per million.
- 3.49 The recommendations in chapter three of this report flow from this initial recommendation, including that Australia be willing to set a target of 80 percent reduction of greenhouse gas emissions by 2050, and that Australia pursue the creation of an international carbon market as a mechanism for reducing greenhouse gas emissions.
- 3.50 Above all, it is imperative to reach an international agreement to reduce greenhouse gas emissions.³³ Climate change resulting from human caused greenhouse gas emissions is a global problem of such magnitude that no one country can address it.
- 3.51 Any international agreement will have to take account of the position of developing and transitional nations. Developing and transitional nations have a persuasive argument for not agreeing to a national approach to allocating emissions reductions. Developed nations are responsible for the bulk of greenhouse gasses in the atmosphere at present, having emitted significant amounts of greenhouse gasses in the process of reached developed status. Developing and transitional nations are unlikely to consider shouldering the burden of fixing the problem as equitable when

31 Garnaut, R., *The Garnaut climate change review*, 2008, p. 277.

32 Garnaut, R., *The Garnaut climate change review* 2008, p. 279.

33 The Australian Workers Union, *Submission No. 25*, p. 6.

their citizens still have not achieved the standard of living in developed nations.³⁴

- 3.52 The Committee believes that, having created the global heating problem through emissions since the industrial revolution, the developed nations have a responsibility to take on the bulk of the emission reduction burden. This belief is reflected in the Committee's recommendation that Australia be willing to set a target of an 80 percent reduction in greenhouse gas emissions by 2050. The belief is also reflected in the commitment by the President of the United States to set the same target.
- 3.53 If this target were set by all developed nations, the burden on developing and transitional nations would be light enough to enable them to make a smooth transition to low emission technologies as part of the process of reaching developed status.
- 3.54 Consequently, the Committee makes the following recommendation for the Australian Government's position the 15th Conference of the Parties to the United National Framework Convention on Climate Change in Copenhagen later this year.

Recommendation 4

The Committee recommends that the Australian Government take the following position to the 15th Conference of the Parties to the United National Framework Convention on Climate Change in Copenhagen, Denmark:

- **that the international community reach an agreement to stabilise greenhouse gas emissions at around 450 parts per million or lower of carbon equivalent;**
- **that the agreement distribute responsibilities for reducing greenhouse gas emissions across nations by requiring developed nations to reduce emissions by 80 percent by 2050, with the residual reductions distributed fairly between developing and transitional nations; and**
- **that the agreement establish an international carbon market as the primary mechanism for achieving the necessary reductions.**

34 Carbon Tax Centre, <http://www.carbontax.org/introduction/>, viewed on 9 February 2009.

3.55 In the following chapter, the Committee turns to consider some mechanisms for reducing emissions in Australia.