



## **Review of the Emissions Trading Scheme and related matters**

Report of the Emissions Trading Scheme Review Committee

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Forty-ninth Parliament  
(Hon Peter Dunne, Chairperson)  
August 2009

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*Presented to the House of Representatives*

I.23A

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# Review of the Emissions Trading Scheme and related matters

## Recommendations

The Emissions Trading Scheme Review Committee makes the following recommendations to the Government.

### Central and benchmark projections

1 We recommend that the IPCC assessment, its projections, and the findings of the *Fourth Assessment Report*, which represent a consensus on the scientific evidence, underpin New Zealand's future international policy negotiations. We note that there are some uncertainties in the science and these are not yet adequately included in the models. However, we do not consider that these uncertainties undermine the main conclusions of the IPCC, or that they should be a reason to delay action by the international community, particularly as recent scientific analysis of actual trends strongly suggests that the worst-case IPCC projections are already being realised. (*Opposed by the ACT New Zealand Party*).

2 We recommend that New Zealand take action now to reduce its emissions and send a credible signal about the direction of future policy in order to protect our international reputation, particularly in the areas of trade and tourism. Human-induced climate change poses a global threat, and there is a need for a collective global mitigation effort. New Zealand has a commitment under the United Nations Framework for the Convention on Climate Change and its Kyoto Protocol to adopt national policies and take corresponding measures to limit its human-induced emissions and enhance its sinks and reservoirs. Under Kyoto, New Zealand has assumed legally binding obligations to reduce its average emissions to 1990 levels over the first commitment period (2008 to 2012).

### International context

3 We recommend that New Zealand pursue an agreement at the December 2009 Copenhagen Climate Change Conference that reflects New Zealand's willingness to do its fair share and play its part in setting the stage for further multilateral action for the post-2012 period. While we are hesitant to speculate on the form such an agreement will take, we are optimistic about the prospect of an international agreement resulting from the December 2009 Copenhagen Climate Change Conference that will set the stage for further multilateral action for the period post-2012.

### New Zealand's policy response

4 We recommend that a full and comprehensive regulatory impact analysis be undertaken preliminary to any amendments to the Climate Change Response Act 2002. The regulatory impact analysis is only one tool for evaluating policy. In addition, the models are based on a set of assumptions and the quality of the underlying data has a relative effect on the outcome of the study. However, the 2009 NZIER and Infometrics

Report did emphasise the need for clear and consistent policy signals about the pricing of carbon so that businesses can make efficient long-term investment decisions.

### **Emissions trading scheme or carbon tax**

5 We recommend an upstream point of obligation as the most suitable for the liquid fossil fuels and stationary energy sectors. For the agriculture sector, while it is preferable in the long term for the point of obligation to be at the farm gate, we recommend that it is initially set at the processor. Placing the point of obligation at the farm gate means regulating more emitters directly, with higher transaction and administration costs. However, it may also encourage them to respond more readily to a price signal. Therefore, it is desirable for the point of obligation to initially be set at the processor level, which would place obligations on only a small number of firms. The price impacts are likely to be passed through to farmers.

6 We recommend that New Zealand pursue an emissions trading scheme as the primary economic mechanism in its response to climate change. We consider that it is preferable to a carbon tax because of its ability to link internationally with other emissions trading schemes and to track the international price of emissions units, and greater flexibility for compulsory participants in managing price risks over extended periods. An emissions trading scheme devolves the management of uncertain emissions prices and behaviours to emitters, whereas under a tax, the Government, and ultimately the taxpayer, bear the cost of these uncertainties. *(Opposed by the Māori Party and the ACT New Zealand Party.)*

### **Design of New Zealand Emissions Trading Scheme**

7 We recommend that on the basis of long-term trends in markets and international circumstances, all sectors be included in a broad emissions trading scheme so that no sector is required to be subsidised by others in the longer-term, or by the taxpayer. We consider that a broader emissions trading scheme would lower the overall costs of abatement, deliver greater economic transformation, and would be more equitable. A broader scheme will also be more effective in achieving abatement across a number of sectors, enabling firms to become more efficient and to reduce costs.

8 We recommend international linkages be adopted between a New Zealand emissions trading scheme and other Kyoto-compliant schemes that would lower the overall cost of abatement with environmental integrity and deliver economic transformation more efficiently. Linkages also help to ensure liquidity, with environmental integrity, allowing the efficient functioning of an emissions trading scheme. They can expose businesses to any price volatility on the international market, but may also buffer price volatility in the domestic market. Restrictions on international linkages to the broader Kyoto compliance market may be applied to facilitate bilateral linking, to achieve domestic abatement, or in the interests of environmental integrity. There may also be good reason to limit international linkages in the short term while the New Zealand emissions trading market matures.

9 We recommend that certainty for the forestry industry be legislated for as soon as possible to ensure that further planting is not inhibited.

10 We recommend that if a short-term price cap is introduced, a clear exit strategy is critical for maintaining market confidence and development. A case can be made for a short-term price cap to assist firms while the market is developing. In the long term, however, price caps stand in the way of market development and shield business from the real price of carbon to the economy. *(Opposed by the New Zealand Labour Party, the Māori Party, the ACT New Zealand Party, and the Green Party.)*

11 We recommend that any border tax adjustment be considered only as a last resort and in response to the actions of other countries. The Kyoto Protocol does not endorse or provide for border tax adjustments. Annex I parties are left to manage their own domestic policies to minimise adverse effects, including any on international trade. If New Zealand were to impose a unilateral border tax adjustment, it would be likely to draw adverse international attention and meet challenges in the World Trade Organisation. A border tax might address competitiveness concerns but the case for free allocation to the industrial and agricultural sectors under an ETS would need to be reviewed, along with the general process for developing allocation plans. Border tax adjustments do not provide strong domestic incentives to reduce emissions, while Kyoto-style obligations impose an economic cost on countries that do not reduce their emissions.

12 We recommend that direct regulation be used to provide a more targeted response to specific activities with high emissions, which may in turn accelerate changes in behaviour. We consider that there is merit in preparing an analysis of the direct regulations that have been introduced in Australia, the United States, and the European Union to establish how direct regulation of such things as energy efficiency standards, vehicle emissions standards, waste levies, recycling regulations, and requirements to purchase renewable energy might be best applied in New Zealand

### **Transition to New Zealand Emissions Trading Scheme**

13 We recommend that the agriculture sector be included in the NZ ETS with the long-term goal being that the point of obligation is placed at farm level, once issues relating to the number of participants and the ability to verify farm-level information are resolved. *The New Zealand Labour Party and the Green Party strongly support the entry of the agriculture sector no later than January 2013. The ACT New Zealand Party is opposed to the agriculture sector being included in the ETS.*

14 We recommend that officials continue to work with the synthetic gases industry to develop a workable model to address concerns around the surrender obligations for synthetic gases, HFCs, PFCs, and SF<sub>6</sub>s before January 2013.

15 We recommend that emission trading scheme rules be confirmed as soon as possible so that those who have significant interests in the primary sector may make practical and robust investment decisions quickly.

### **Forestry sector**

16 We recommend that the issue of offsetting be pursued by those currently negotiating its international recognition, but no changes to domestic policy be made unless such an agreement is reached.

17 We recommend that further research be conducted on the role of forestry sequestration in mitigating emissions, including an investigation of the carbon sequestration rates of indigenous species and management techniques for their enhancement.

18 We recommend that the carbon look-up tables for indigenous forests be amended to reflect the best scientific information on sequestration as soon as possible.

19 We recommend that a clear decision be made about in what circumstances, if any, wilding pines may be used for carbon sequestration, given the negative economic and environmental impact of tree weeds in some areas of New Zealand. Post-1989 tree weed forests are eligible to earn carbon credits under the current Emissions Trading Scheme, creating a disincentive to control wildings.

### **Māori interests**

20 We recommend that the obligations of the Crown to Māori, including those under the Treaty of Waitangi, not be compromised by the New Zealand Emissions Trading Scheme. *This is particularly important in the case of those iwi whose Treaty settlements involve forests.*

21 We recommend that action be taken to implement a communication and engagement strategy to achieve maximum involvement of New Zealanders in climate change policy.

22 We recommend that action be taken to implement a targeted communication and engagement strategy to achieve maximum involvement of Māori in climate change policy, including the Emissions Trading Scheme and to ensure that they are not unduly exposed to risk.

23 We recommend that a better-targeted structure for Māori research and development of emissions reduction technologies and new climate change-related technologies.

24 We recommend that, as a general principle, Māori not be asked to bear a greater burden or be more disadvantaged than other sections of the New Zealand community.

### **Complementary measures**

25 We recommend that long-term infrastructure be developed in line with climate change considerations and that New Zealand support Pacific nations in adapting to climate change.

26 We recommend that high priority be given to research into reliable and accurate estimation and monitoring systems for agricultural emissions, particularly at farm level.

27 We recommend that New Zealand's economic and environmental planning activities include climate change mitigation, and adaptation strategies. Because climate-resilient infrastructure and economic development will reduce the future vulnerability of our communities and economy, it is important that the social and cultural implications of mitigation and adaptation are well thought through.

28 We recommend that research be undertaken into soil carbon sequestration, specifically to determine its advantages on the basis of a thorough and impartial assessment of the relevant New Zealand science.

29 We recommend that funding of research and development be directed toward giving New Zealand a competitive advantage in the future, allowing it to capitalise on its expertise in sectors such as agriculture, geothermal energy, and forestry.

30 We recommend that New Zealand-specific research be conducted into the adverse effects of climate change on our principal sectors, and the opportunities that might arise from it.

31 We recommend that significant ongoing investment be made to reduce agricultural emissions and improve efficiency in pastoral systems.

32 We recommend that a full array of assistance measures be adequately considered and targeted at rural communities, lower-income households, and other members of the economy who are likely to be more vulnerable to the impacts of climate change and less able to meet the costs of an emissions trading scheme.

33 We recommend that the Emissions Trading Scheme be supplemented with policies to improve its effectiveness and that any policies that undermine its effectiveness be identified.

34 We recommend a comprehensive study be undertaken to identify and assess existing and potential complementary measures specific to New Zealand.

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# 1 Introduction

## Our inquiry

In December 2008 the Emissions Trading Scheme Review Committee was established as a special committee by the House to carry out a review of the New Zealand Emissions Trading Scheme (NZ ETS). The review was initiated in 2008 under the confidence and supply agreement between New Zealand National and the ACT New Zealand Party.

The current scheme was established by enactment of the Climate Change Response (Emissions Trading) Amendment Bill 2008 to apply an economy-wide price signal to activities that contribute to climate change. Under the legislation, the Emissions Trading Scheme would be fully phased in by 2013 and would cover greenhouse-gas-emitting activities in all major sectors of the economy: forestry, stationary energy, industrial processes, transport fuels, agriculture, synthetic gases, and waste.

Although most of the provisions of the Climate Change Response (Emissions Trading) Amendment Bill came into force on 26 September 2008, the recently enacted Climate Change Response (Emissions Trading Forestry Sector) Amendment Bill will delay a number of reporting requirements affecting the forestry sector.

## Terms of reference

The House set the following terms of reference for the review of the New Zealand Emissions Trading Scheme, to:

- 1 hear views from trade and diplomatic experts on the international relations aspects of this issue
- 2 consider the prospects for an international agreement on climate change post-Kyoto 1, and the form such an agreement might take
- 3 require a high-quality, quantified regulatory impact analysis to be produced to identify the net benefits or costs to New Zealand of any policy action, including international relations and commercial benefits and costs
- 4 identify the central/benchmark projections which are being used as the motivation for international agreements to combat climate change; and consider the uncertainties and risks surrounding these projections
- 5 consider the impact on the New Zealand economy and New Zealand households of any climate change policies, having regard to the weak state of the economy, the need to safeguard New Zealand's international competitiveness, the position of trade-exposed industries, and the actions of competing countries
- 6 examine the relative merits of a mitigation or adaptation approach to climate change for New Zealand

- 7 consider the case for increasing resources devoted to New Zealand-specific climate change research
- 8 examine the relative merits of an emissions trading scheme or a tax on carbon or energy as a New Zealand response to climate change
- 9 consider the need for any additional regulatory interventions to combat climate change if a price mechanism (an emissions trading scheme or a tax) is introduced
- 10 consider the timing of introduction of any New Zealand measures, with particular reference to the outcome of the December 2009 Copenhagen meeting, the position of the United States, and the timetable for decisions and their implementation by the Australian Government.

### **Approach to the inquiry**

By the closing date of 29 February 2009 our inquiry had attracted 282 submissions representing a range of interested groups and individuals. The timing of the submissions process was influenced by the need for a timely Government response to the expected introduction of the Australian Carbon Pollution Reduction Scheme legislation, and preparation for the impending United Nations Climate Change Conference in Copenhagen in December 2009. A further consideration was that the Climate Change Response Act 2002 sets out dates for sector-impending entry, for which policy development work was placed on hold pending the finalisation of the review, and for which business certainty is required. These time constraints precluded holding extensive oral hearings. We decided not to hear every submitter who indicated a desire to appear in person. Each political party represented on the committee proposed 20 submissions for the initial hearing. Advisers were also asked to suggest individuals and organisations that we might wish to invite to make submissions, or to be heard in person. Where possible, submitters were grouped in hearings of evidence according to the sector they represented or identified most closely with. We heard 95 oral submissions.

### **Outline of report**

The terms of reference for the inquiry were broad, covering a wide range of issues concerning climate change policy, not just the New Zealand Emissions Trading Scheme itself. Our focus was directed to a large extent by the issues raised during the submissions process, and by the advice received from departmental officials, independent specialist advisers, and experts representing the spectrum of views on climate change.

We begin our report by considering the central benchmarks used as the motivation for international agreements to combat climate change (chapter 2). In chapter 3, we examine these international agreements, focussing on New Zealand's current obligations and looking ahead to possible future commitments. In chapter 4, we discuss the findings of a report commissioned to identify the net benefits or costs to New Zealand of any policy action taken to address climate change. Chapter 5 examines the relative merits of an emissions trading scheme (ETS) over a tax on carbon or energy.

Chapter 6 indicates our preference for an ETS over a tax on carbon or energy. In this chapter we set out what we consider to be the core design features of an ETS.

Implementation issues, including the need for transitional measures and assistance to affected sectors, are addressed in chapter 7. We consider the impacts of an ETS on forestry and Māori in two separate chapters (chapters 8 and 9 respectively). Chapter 10 considers other climate-change mitigation measures that in our view should be undertaken alongside an ETS, such as research and development, monitoring, and adaptation. Our final chapter (chapter 11) includes the minority views of the New Zealand Labour Party, the Green Party, the ACT New Zealand Party, and the Māori Party.

The membership of the committee and the procedures for undertaking the inquiry are set out in Appendix A. A glossary and a list of abbreviations is included in Appendix B. A list of submissions received is set out in Appendix C, along with details of the advice we received, and the material that we considered.

## 2 Central and benchmark projections

### Introduction

We were asked to identify the central and benchmark projections which are being used as the motivation for international agreements to combat climate change, and consider the uncertainties and risks surrounding these projections. In this chapter, we examine the key reports of the Intergovernmental Panel on Climate Change, the models relied upon as evidence of climate change, and the reliability of projections.

### Intergovernmental Panel on Climate Change

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organisation (WMO) and the United Nations Environment Programme, at the request of Governments in recognition of the potential problem posed by global climate change. It is open to all members of the United Nations and the WMO. The mandate of the IPCC is “to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of the risk of human-induced climate change, its potential impacts and options for adaptation and mitigation”.

The IPCC compiles assessments of scientific data and socio-economic information relevant to climate change. IPCC assessments are generated from peer-reviewed and published scientific and technical literature, and are required to give a balanced and comprehensive breakdown of existing knowledge, acknowledging and describing divergent opinions. IPCC reports are relevant to policy but not policy-prescriptive.

We received a number of submissions that disputed the findings of the IPCC. The climate projections motivating the current international negotiations on climate change are largely those assessed in the *IPCC Fourth Assessment Report*, completed in 2007. The Parliamentary Commissioner for the Environment, Dr Jan Wright, told us that “there are no credible projections, other than those from the IPCC”. We are advised that the New Zealand Government accepts the findings of the IPCC.

We also heard evidence detailing the rigorous and open review process, which we note is audited by authors from the international scientific community, selected by the IPCC working group bureaux, and Governments.

### Modelling the physical climate

Scientists use computer models to determine the possible future climate that might result from changes in the drivers of the climate system, particularly from changes in the atmospheric concentrations of greenhouse gases. The *IPCC Fourth Assessment Report* includes projections of climate change derived from a wide range of predicted physical, chemical and biological processes, put together by different groups around the world.

Using the outputs of such climate models, scientists have investigated the effects of projected surface warming on wind, rain, sea level, and other climate variables on many of the Earth's physical and biological systems.

The *IPCC Fourth Assessment Report* reported some key findings on climate change impacts, vulnerabilities, and adaptation. It describes a “coping temperature” range, within which adaptation to climate change impacts is possible, and a threshold at which adaptation is no longer a realistic option. Some systems, sectors, and regions are likely to be particularly vulnerable to climate change because of their more limited capacity to adapt. In every region, even the most developed, some people and sectors are particularly at risk from climate change. The severity and extent of most impacts is shown to increase not only with the amount of climate change but also with the rate of climate change.

### Emissions scenarios

In 2000, the IPCC released a set of scenarios for global emissions until the end of the 21st century. The projections factored in various demographic, economic, and technological assumptions regarding greenhouse gas emissions. The scenarios were developed over a two-year period through an open international process. They are described in the *IPCC Special Report on Emission Scenarios*.<sup>1</sup> Their underlying assumptions about socio-economic, demographic, and technological change have contributed to many recent climate-change vulnerability and impact assessments.

Six of the scenarios have been labelled “marker scenarios,” which are representative of groups of similar scenarios.

- Scenario A1 assumes very rapid economic growth, a global population that peaks in mid-century, and the rapid introduction and global transfer of new and more efficient technologies. A1 is subdivided into three groups of scenarios for divergent technological change—fossil-fuel intensive (A1F1), non-fossil energy resources (A1T), and balanced energy sources (A1B).
- Scenario B1 assumes the same global population as A1, but with more rapid changes in economic structures toward a service and information economy, and more global focus on sustainability and environmental challenges.
- Scenario B2 assumes intermediate population and economic growth, emphasising local solutions to economic, social, and environmental sustainability.
- Scenario A2 describes a world of high population growth, slow and regionalised economic development, and slow technological change or transfer.

The scenarios project future climate changes in the absence of an international policy response. Some of the scenarios (such as B1 and A1T) assume further significant development and diffusion of low-carbon technologies and improvements in energy efficiency for other reasons such as energy security, and in response to non-climate-related concerns such as air pollution and resource depletion. Under all of these scenarios, however, greenhouse gas concentrations continue to increase through the 21st century.

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<sup>1</sup> *IPCC Special Report on Emission Scenarios 2000*. The full report is available at: [www.ipcc.ch/ipccreports/sres/emission/index.htm](http://www.ipcc.ch/ipccreports/sres/emission/index.htm)

According to the latest IPCC Synthesis Report, which summarises the results of the Climate Change Congress that took place in Copenhagen in March 2009, we understand that recent scientific analysis of actual trends, yet to be picked up by the IPCC process, strongly suggests that the worst-case IPCC projections are being realised.

### **Stabilisation scenarios**

The IPCC Fourth Assessment groups projected emission scenarios into six categories, depending on the final stabilised level of greenhouse gas concentrations in the atmosphere. For each category, the assessment has projections of carbon dioxide emissions, global temperature, and sea-level rise. The scenarios in the lowest stabilisation category have global emissions peaking before 2015 and falling to almost zero by 2100. Even with this scale of reduction, it projects temperatures reaching 2.0 to 2.4 degrees Celsius above pre-industrial levels. It is generally accepted by the global community that even if this lowest of the stabilisation categories is achieved, the resulting global warming is likely to have effects that are “unacceptable”.

### **Updated emissions scenarios**

The *Special Report on Emission Scenarios* is over ten years old, and many societies have developed in unforeseen ways. In some rapid developing Asian economies, for example, emissions are higher than expected and are already exceeding the predictions in the IPCC emissions scenarios. The IPCC has since adopted updated scenarios, which will be used to project climate changes and impacts in its 2014 assessment report.

### **Baseline scenarios and emissions reductions**

“Baseline scenario” studies have been used to determine the allocation of responsibility in future international agreements. It is generally agreed that in the short term developed countries should reduce their emissions, while those of developing countries should continue to grow but at a restricted rate.

The *IPCC Fourth Assessment* reviewed published studies of likely future international emissions paths, and assessed that a stabilisation target of 450 parts per million (ppm) is feasible.<sup>2</sup> The underlying publications indicate this target may be achieved if developed countries reduce their emissions by 25 to 40 percent by 2020, and 80 to 95 percent by 2050, and the rest of the world to somewhere between 10 and 30 percent of their “baseline,” or below their projected growth, by 2020.

### **Reliability of projections**

The IPCC 2007 Synthesis Report suggests a range of possible global temperature outcomes by the year 2100.<sup>3</sup> The magnitude of projected climate change is subject to socio-economic uncertainty, as policy decisions and technological developments cannot be predicted. There is also a degree of scientific uncertainty, limiting the precision with which a given level of greenhouse gas emissions can be related to a particular value of warming. Scientific uncertainty is diminishing, owing to accumulating observational evidence and

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<sup>2</sup> See den Elzen and Hohne, 2008, *Climate Change (2008)* 91:249-274.

<sup>3</sup> IPCC, 2007: *Climate Change 2007: Synthesis Report*.

improvements in climate models, but limitations remain, particularly at small scales and in the representation of some small-scale processes.

The *IPCC Fourth Assessment Report*, summarised in the Synthesis Report, outlines the remaining significant uncertainties. They include the strength of various feedback effects (cloud and carbon-cycle feedbacks, and oceanic heat uptakes) in the climate system, predictions regarding the Antarctic and Greenland ice sheets, possible large-scale ocean circulation changes, and our understanding of the probability and impact of events as a basis for managing risk. Many climate change scientists believe that, as these uncertainties are resolved, the projected changes in climate will be greater, not less, than otherwise predicted.

Uncertainty is inevitable, but not a reason to delay action by the international community. Nor has uncertainty diminished the will of the international community to take action on climate change.

### **Other uncertainties**

Climate change in New Zealand may not so far have been as discernible as it is elsewhere in the world, but the IPCC considers that the evidence of warming of our climate system is now unequivocal. It should be noted that in developing countries especially, there may be poor geographic coverage of monitoring and a lack of observations in both natural and managed systems. The magnitude of carbon dioxide emissions from land-use change and methane emissions from particular sources may also be contested. The latter factor is reflected in uncertainty over New Zealand's land-based sector's emissions.

### **Concluding remarks**

The IPCC has recently undertaken a comprehensive assessment of the scientific, technical, and socio-economic information relevant to the issue of climate change. It projects climate change impacts on a scale that is widely regarded by the global community as unacceptable. The projections indicate that global emissions must be reduced substantially to stabilise atmospheric greenhouse gas levels sufficiently to avoid these adverse effects. To assist Governments in dealing with this issue, the *IPCC Fourth Assessment Report* sets out policy options, and the costs and consequences of both action and inaction, but it does not prescribe a particular course of action.

The assessment represents a consensus on the scientific evidence. The IPCC projections and the findings of the *IPCC Fourth Assessment Report* underpin the international policy negotiations. While there are uncertainties and risks regarding these projections, they provide a framework for considering the nature and magnitude of the policy response required.

### **Recommendation**

1 We recommend to the Government that the IPCC assessment, its projections, and the findings of the *Fourth Assessment Report*, which represent a consensus on the scientific evidence, underpin New Zealand's future international policy negotiations. (*Opposed by the ACT New Zealand Party.*)

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## 3 International context in relation to New Zealand

### Introduction

A key aspect of our inquiry involved hearing views from trade and diplomatic experts on the international relations aspects of climate-change mitigation. We were asked to consider the prospects for an international agreement on climate change post Kyoto 1, and the form such an agreement might take. We also sought their views on the timing of introduction of any New Zealand measures, with particular reference to the outcome of the December 2009 Copenhagen meeting, the position of the United States, and the timetable for decisions and their implementation by the Australian Government. In this chapter, we consider the current international agreements and New Zealand's obligations under them, and the prospects for future negotiations for an international agreement beyond the life of the Kyoto Protocol.

### United Nations Framework Convention on Climate Change

The 1992 Earth Summit in Rio de Janeiro led to the United Nations Framework Convention on Climate Change (UNFCCC)—an international environmental treaty aimed at stabilising greenhouse-gas concentrations in the atmosphere at a level that would not cause dangerous anthropogenic interference with the climate system. The convention aims to achieve such a level within a timeframe sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to allow economic development to proceed sustainably. What constitutes a safe level has not yet been agreed, although the European Union has committed to limiting warming to not more than 2 degrees Celsius above pre-industrial levels. The IPCC estimates this has a 50 percent chance of being achieved if concentrations are stabilised at 450 ppm by volume of CO<sub>2</sub> equivalent. In the current international negotiations, this is the most widely favoured figure, although some countries (particularly smaller island states) argue it should be much lower (such as 350 ppm of CO<sub>2</sub> equivalent) to which the IPCC assigns an 80 percent probability of keeping warming below 2 degrees.

Nations that are party to the convention have committed themselves to mitigating the effects of climate change by taking measures including compiling national inventories and monitoring greenhouse gas sources and sinks, as well as adapting to climate change effects. In addition, developed countries agreed to aim to reduce their greenhouse gas emissions to 1990 levels. This did not happen.

Ultimately, the convention's emission-reduction target for developed countries was an aspirational commitment, and was not effective in encouraging sufficient action, so countries began to work towards a more effective solution for reducing greenhouse gas emissions.

**Kyoto Protocol**

The 1997 Kyoto Protocol to the UNFCCC came into force in February 2005, and is the basis for New Zealand's current climate-change commitments. The protocol commits Annex I countries to specific targets, and to date it has 186 signatory countries plus the European Union community. The United States is the only Annex I party to the convention that has not ratified the Kyoto Protocol.

The protocol requires Annex I countries to take measures to limit and reduce their emissions over a series of commitment periods. The first commitment period, from 2008 to 2012, assigned individual emissions targets to countries within a range between 8 percent below and 10 percent above 1990 levels. New Zealand's target is equal to its 1990 level. All 37 Annex I countries plus the European Economic Community have taken on targets under the Kyoto Protocol.

Parties to the protocol are issued an assigned quantity of permissible emissions equal to their target level multiplied by the number of years in the commitment period. Countries must implement domestic measures to meet their targets, and may also use "flexibility mechanisms" to do so. The flexibility mechanisms are three market-based instruments: International Emissions Trading, Joint Implementation, and the Clean Development Mechanism. These mechanisms allow developed countries to purchase emissions units from other developed countries and also from emissions reduction projects implemented in other countries to balance the amount by which they exceed their permitted emissions. The Kyoto Protocol also allows new forests planted in or after 1990 to earn forest sink credits, which can be used to meet international obligations.

**New Zealand's obligations under the UNFCCC and the Kyoto Protocol**

New Zealand ratified the Kyoto Protocol in December 2002 after a national interest analysis indicated that this country's economic base in primary production and its environment and public health would benefit from a continuing commitment to advancing a global response to climate change. The analysis found that there are no alternative international approaches to Kyoto that would help reduce greenhouse gas emissions. At the time, New Zealand had been party to more than ten years of negotiations leading to Kyoto, and it was recognised that its continued commitment would maintain its long-standing influence in future negotiations. The analysis also stated that New Zealand stood to make a small net economic gain from the first Kyoto commitment period because "the carbon sink credits New Zealand will receive in recognition of the greenhouse gas absorbing properties of its plantation forests will more than offset the emissions reductions required to meet New Zealand's emissions target". Other economic benefits mentioned included improvements in technology and energy efficiency, and environmental and health benefits from reducing climate change, and from ancillary effects such as better local air quality.

As an Annex I party, New Zealand's primary obligation is to meet its emissions reductions commitment under the Kyoto Protocol. New Zealand must also provide regular "national communications" to the UNFCCC secretariat detailing specific policies and measures adopted to mitigate climate change, information on national circumstances, and support provided to developing countries. It must also provide annual inventories of national emissions, which are subject to third-party verification by international experts.

Annex I parties also have an obligation to assist developing countries with financial and technological support for mitigation and adaptation measures. Currently, New Zealand's assistance takes the form of official development assistance, contributions to the Global Environment Facility, one-off contributions to multilateral funds (such as the UNFCCC's Least Developed Countries Fund), and a New Zealand-administered Climate Change Development Fund.

### **New Zealand's participation in international agreements**

New Zealand currently accounts for approximately 0.2 percent of global emissions.<sup>4</sup> This has been interpreted by some to imply that New Zealand should take no action or incur no costs to mitigate climate change. But no country can mitigate climate change alone; it requires a global effort, particularly from the major emitters. For several reasons it is in New Zealand's interests to assume a fair share of global emission reduction efforts.

New Zealand's emissions may be small on a global scale but they are not insignificant. All emissions affect climate change, and collective international action will be necessary. New Zealand is engaged in negotiations for a post-2012 international climate-change agreement, and has made a commitment to undertake a fair share of the global effort. By participating in a multilateral agreement, New Zealand can help influence the remaining large and rapidly industrialising countries that are not participants. The New Zealand Climate Change Research Institute puts it this way: "New Zealand could choose not to participate in global mitigation efforts but this would be inconsistent with our general reliance on multilateral solutions to global problems that affect New Zealand".<sup>5</sup>

It is likely that international climate change obligations will become increasingly stringent, and investment in long-term infrastructure must take this into account. If New Zealand does not take action to reduce its emissions soon and send a credible signal about the direction of future policy, it may commit itself to a costly emissions-intensive development pathway for the long term.

New Zealand's climate change response will impact on the branding of New Zealand and New Zealand's products. On the basis of the Kyoto calculation methodologies for emissions and the inclusion of agriculture, New Zealand's emissions per capita are high compared with most developed countries, which goes against our international "clean-green" image.

New Zealand's international reputation, especially in the areas of trade and tourism, may be harmed if it is perceived that we are not contributing adequately to climate-change mitigation. Export markets and consumers are increasingly making purchase decisions with climate-change concerns in mind. Market access and consumer decisions are important to the New Zealand economy. It is essential that New Zealand's climate change policies support, not work against, our export sector.

Specialist advisers recommended that

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<sup>4</sup> World Resources Institute Climate Change Analysis Indicators Tool, with data for 2005.

<sup>5</sup> Submission 240, New Zealand Climate Change Research Institute.

- it is important to ensure that, in the short- to medium- term, New Zealand's response is not modelled on the theoretical ideal emissions market
- New Zealand's domestic response will need to balance environmental, social, and economic factors
- options for a coordinated approach to developing an aligned brand strategy to build on and enhance New Zealand's clean green reputation be explored.
- New Zealand's domestic response to climate change consider environmental factors, both in the context of their impact on a domestic level, and from a global perspective.

We consider that New Zealand should continue to be engaged, and do its fair share, in international efforts to reduce emissions, for environmental and economic reasons. Although it is difficult to quantify the benefits of New Zealand's involvement, we are of the view that it is in both New Zealand's and the global interest for New Zealand to participate in international efforts to reduce emissions.

### **Copenhagen negotiations—key issues and challenges**

Human-induced climate change poses a global threat, and there is need for a collective global mitigation effort. *The Stern Review: The Economics of Climate Change*, prepared for the United Kingdom Government in 2006, concluded that if we do not act in the next 10 to 20 years to reduce greenhouse gas emissions to avoid the worst impacts of climate change, the overall costs and risks will be far greater in the long term. The review concluded that the costs of inaction on climate change will be equivalent to losing at least 5 percent of global gross domestic product 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 percent of GDP or more. The GDP loss can be limited to 1 percent each year if action is taken soon.

All countries are affected by climate change, but individually, are powerless to limit it. Furthermore, spending money on emissions has no direct benefit within national boundaries. An international effort is needed if greenhouse gas concentrations are to be stabilised at a safe level, and individual countries are to benefit from emissions reductions.

In 2007, the Bali Climate Change Conference produced a Bali Action Plan for long-term cooperation to implement the UNFCCC, and a Bali Roadmap for concluding negotiations on a post-2012 agreement by the end of 2009 (the Copenhagen Climate Change Conference). The negotiations are occurring through two tracks: the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol, and the Ad Hoc Working Group on Long-term Cooperative Action under the Convention. Discussions under the former are focusing on further commitments for Annex I Parties. Discussions under the latter are focusing on five central issues across all developed and developing countries—a shared vision for long-term cooperative action including a long-term global goal for emissions reductions, mitigation, adaptation, finance, and technology.

The IPCC has found that long-term stabilisation at 445-490 ppm CO<sub>2</sub>-e would give a 50 percent chance of limiting global temperature increases to 2-2.4 degrees Celsius. The EU has adopted a goal of limiting warming to 2 degrees Celsius, which corresponds to a concentration of around 450 ppm CO<sub>2</sub>-e. Based on more recent scientific information

regarding the potential consequences of a 2-degree Celsius increase and the uncertainty around limiting warming to 2 degrees, some parties, particularly small island developing states, say that atmospheric concentrations should be stabilised as far below 350 ppm CO<sub>2</sub>-e as possible, with temperature increases limited to as far below 1.5 degrees Celsius above pre-industrial levels as possible.

The convention track recognises that most of the world's emissions growth over the coming decades will come from developing countries. For the first time, at least the major emitting and advanced developing countries will be required to make measurable contributions to reducing global emissions. Annex I parties will have emissions reduction targets, but the nature of the mitigation obligations, and the financing, technology, and adaptation commitments for non-Annex I parties remain to be decided. Developing countries want to secure firm targets from developed countries along with their commitments for finance and technology transfer, without conditions on the level of their own mitigation effort. Developed countries are awaiting meaningful and quantifiable mitigation contributions from developing countries, with accountability for financial support received. A balance between action by developed and developing countries action must be achieved if a global agreement is to be reached.

The negotiations run on the expectation that all countries will participate in the global effort, according to their ability to do so and regardless of their size. However, the rigid division into Annex I and non-Annex I, or developed and developing countries, has effectively polarised negotiations. Developing countries will be responsible for most of the world's emissions in the coming decades, but in recognition of their development needs, they are not expected to take on targets post-2012 as ambitious as New Zealand's, even in cases such as Singapore, which have a higher GDP per capita. The polarisation also means that the interests of smaller and more vulnerable countries are neglected.

Diplomacy outside the United Nations, such as the "Group of Eight" (G8) and the United-States-led Major Economies Meeting, has made headway in lessening these limitations. The United States has positively re-engaged in the international negotiations and is seeking an international framework that aligns better with their domestic climate-change policy settings.

The Bali Road Map negotiations require, for the first time, that developing countries make measurable contributions to reducing greenhouse gas emissions. To date, the negotiations have been hindered because developing countries are seeking firm emissions reduction commitments and money from developed countries before they take further action. Diplomacy is needed in order for developing countries to access assistance for their adaptation needs and to deploy the technologies for transitioning to low-carbon economies. There also needs to be special recognition of the needs of the poorest and most vulnerable countries, including Pacific Island states.

### **Prospects for New Zealand**

New Zealand has held an active role in the United Nations negotiations and in other diplomatic forums including APEC.

Priorities for New Zealand in the negotiations include the following

- securing an effective, long-term international framework that includes appropriate and effective action on mitigation by all developed countries and by major emitting and advanced developing countries
- achieving clarity on and improvements to the rules for land use, land use change and forestry, and the flexibility mechanisms
- building understanding amongst the international community of the unique challenges in agriculture and its potential to reduce emissions
- ensuring recognition of New Zealand's national circumstances
- securing a good outcome for Pacific Island countries.

### **Concluding remarks**

Recent trends in international attitudes indicate that some significant steps are being made towards achieving a multilateral agreement for the period post-2012. The Australian Government recently announced its intention to introduce a Carbon Pollution Reduction Scheme after years of policy inaction on climate-change-related initiatives. A recent change of administration has seen the United States move from a focus on bilateral and sectoral activities to declaring the need for a multilateral agreement from 2012. A federal ETS is under active discussion in the United States Congress. A recent US accord with China has opened up China's market to American clean technology products, while nudging it towards commitment to reduce greenhouse gas emissions. The G8 and the "Group of 20" summits have both highlighted climate change as an issue of global concern.

We are optimistic that the Copenhagen Climate Change Conference 2009 may achieve an international agreement and set the stage for further multilateral action. We are, however, hesitant to speculate on the form that such an agreement may take, but consider that one may be close at hand, and that it will be the most effective global mechanism so far for reducing global emissions.

### **Recommendations**

2 We recommend to the Government that New Zealand take action now to reduce its emissions and send a credible signal about the direction of future policy in order to protect our international reputation, particularly in the areas of trade and tourism.

3 We recommend to the Government that New Zealand pursue an agreement at the December 2009 Copenhagen Climate Change Conference that reflects New Zealand's willingness to do its fair share and play its part in setting the stage for further multilateral action for the post-2012 period.

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## 4 Impact of New Zealand's policy response

### Introduction

The terms of reference for our inquiry required a high-quality, quantified regulatory impact analysis (RIA) to be produced to identify the net benefits or costs to New Zealand of any policy action, including international relations and commercial benefits and costs. The Government commissioned a report from the New Zealand Institute of Economic Research (NZIER) and Infometrics (*Economic Modelling of New Zealand Climate Change Policy*). This chapter discusses the key findings of that report and its application to determining the most effective policy response for New Zealand to climate change.

### Regulatory impact analysis

The terms of reference for the RIA required a fully quantified economic cost-benefit analysis of

- the least-cost option for meeting any Kyoto liability
- the proposed NZ ETS
- a revenue-neutral tax on carbon, coupled with an equivalent subsidy for carbon sinks, or a tax on energy.

The report provides an economic analysis that goes some way to addressing the inquiry's terms of reference. However, as these terms of reference were very broad, the scope of the economic analysis had to be narrowed in order to define some discrete policy options for the modellers to analyse. The study did not examine wider issues, such as whether New Zealand should be part of an international climate-change agreement, the costs of climate change itself, or the non-economic benefits of taking action against climate change. The study therefore does not constitute a complete regulatory impact analysis.

Having said this, we are aware of the view that New Zealand's involvement in international efforts to reduce emissions is warranted, as discussed in chapters 2 and 3. We would anticipate that a RIA is prepared to accompany any amending legislation that may be introduced later in the year.

Infometrics and NZIER used general equilibrium models to analyse the short-term (until 2012) and long-term (until 2025) impacts of climate-change mitigation scenarios. The modelling was carried out by NZIER and Infometrics separately. The impacts of different scenarios were examined, including

- high and low world carbon prices
- technological change
- actions taken by the rest of the world
- free allocation

- a narrow tax on energy
- a broad-based tax where the tax rate falls higher or lower than the world carbon price
- the Government pays (no price mechanism—the Government funds New Zealand’s Kyoto liability from general taxation).

All of the policy scenarios assumed no international obligations, trade sanctions, or costs on the economy as a result of climate change. The report acknowledges that this “business-as-usual” scenario is artificial—New Zealand has signed the Kyoto Protocol and therefore has liabilities. The modelling shows that the New Zealand economy would continue to grow under a carbon pricing scheme in all scenarios, albeit at a slightly slower rate.

### Key findings

The modelling results show that in the short term, the least-cost way of meeting our Kyoto liability is for the Government to purchase permits funded from general taxation.<sup>6</sup> NZIER and Infometrics suggest, however, that there would be little difference in economy-wide costs between this option, the NZ ETS as proposed, and a narrow carbon tax.

The report recommended the introduction of an ETS and the inclusion of all sectors and all gases over time. The RIA concludes that in the short-term, an ETS should be introduced with free allocation to competitive-at-risk sectors, with agriculture excluded if measurement of its emissions is prohibitively expensive. Free allocation should be linked to output, and be phased out as our competitors adopt carbon pricing. Agriculture should be excluded if the costs of measurement exceed the benefits of its being included. If it is excluded initially, agriculture should be transitioned in, with free allocation as required, as measurement becomes economically feasible.

The report found that in the long term, the introduction of a carbon price is warranted, and a broad-based carbon pricing scheme would incur the least cost, even when no action is assumed by the rest of the world and there is no resulting technological change. In the absence of technological change and a carbon price, free allocation of permits or sectoral exemptions may improve overall welfare. The case for free allocation diminishes with a higher rate of global technological change, and with more extensive international carbon pricing.

The models suggest that as the carbon price rises above a certain level, some form of broad-based pricing scheme will incur the least cost, even when no action is assumed by the rest of the world and there is no technological change. At a CO<sub>2</sub> equivalent price of NZ\$25 per tonne, the Infometrics model ranks a carbon price equal with a Government-pays scenario. The NZIER model leans further toward a Government-pays scheme. At higher prices, both models show that introducing a carbon price is preferable.

Free allocation corresponding to production is found to be more economical than free allocation provided as a lump-sum payment to compensate for stranded assets.

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<sup>6</sup> Unless there are significant benefits from introducing policies to avoid deforestation (see footnote 3 of the NZIER and Infometrics report).

The report does not suggest what would be the least-cost, most broadly-based mechanism—a carbon tax or a cap-and-trade scheme—since a cap-and-trade scheme is modelled on a carbon tax. However, the study does analyse a carbon tax scenario where the taxation rate is higher or lower than the world carbon price (that is, the tax is not set at the optimal rate). It suggests that there would be no real change in welfare if the taxation rate were higher or lower than world carbon prices, although the world carbon prices used in these scenarios is low (\$25) and the report acknowledges that a price differential at higher world carbon prices would lead to sub-optimal welfare.

The report also emphasised the need for clear and consistent policy signals about the pricing of carbon so that business can make efficient long-term investment decisions.

### **Comment**

It must be remembered that the cost of reducing emissions arises primarily from our Kyoto obligation, and that an ETS is a mechanism to devolve into the economy the real costs of the Kyoto agreement.

While the report provided some useful information on the relative costs and benefits of various climate-change policy options, we are aware that it is only one tool for evaluating policies. The models are based on a set of assumptions and the quality of underlying data should be taken into account. In particular, the exact scale and nature of technological improvement is difficult to judge, and history would tend to suggest that responses to a price-based mechanism are more than anticipated.

The study quantifies the direction and relative magnitude of policy options at an economy-wide level, but it does not go so far as to show how these costs will be distributed through sectors of the economy. The models are only pictures of the economy after all policy adjustment has taken place, and do not represent the adjustment phase, or any associated costs and benefits. We also note that the report assumes that the New Zealand economy is currently operating at an optimal level and that the current level of greenhouse gas emissions cannot be cost-efficiently reduced any further. We note the comments of the Parliamentary Commissioner for the Environment that the economic models used in this study did not adequately capture the response of forestry to a price on carbon.

The study does not cover other policy mechanisms, such as regulation, which would require more detailed information not best suited to modelling of this nature. Partial equilibrium analysis may be more suited to quantifying the impacts of regulatory policies.

Modelling difficulties, such as accurately accounting for land-use changes and forestry land use, may result in an overstatement of the costs of a broad-based ETS. The models also do not incorporate the full marginal income tax schedules, so they underestimate the welfare gains to households that will result if revenue from an ETS or carbon tax is used to lower income taxes.

The report recommends a broad-based pricing system, but the long-term modelling results show little difference in welfare between most of the scenarios, including the Government funding the liability from general taxation. The report justifies the introduction of a price on carbon by way of the following:

- Most of the scenarios are based on a \$25 carbon price; as the price rises, some form of pricing scheme will be the least-cost option.
- A price signal gives firms an incentive to change their production patterns and invest in low-emissions technology.
- Putting a price signal in place now gives the economy more time to transition to a low carbon footprint.
- The Government funding New Zealand's Kyoto liability is likely to be an untenable political approach to emissions reduction in the longer term.
- Putting a domestic price on carbon will enhance New Zealand's negotiating ability in the international arena.

The report found that if the rest of the world does not take action and additional technological change is not induced by a carbon price, the free allocation of permits might improve welfare relative to full auctioning of permits. It should be noted that these stipulations are likely to diminish over time. The actions of the rest of the world will most likely occur along a continuum between no action and full action. In all other scenarios other than the "technology" scenario, the models also assume that new technology and changed behaviour are not induced by the existence of a carbon price, and in the technology scenario, some discrete examples are considered. Technology improvements though, are a function of time and price, so the rate of change should increase with the carbon price and over time.

The models suggest that free allocation has some benefits when implemented as a transitional measure, but they do not provide guidance on distribution and phase-out. Granting free allocation to at-risk industries transfers some of the costs of their emissions to other parts of the economy (including taxpayers). Equity concerns can not be accurately conveyed by the modelling, but should be taken into account when evaluating the extent to which this is desirable. Equity concerns also apply to the situation where the entire liability is funded by the Government from general taxation.

The use of general equilibrium models to distinguish between the welfare difference of a carbon tax and an ETS is limited, because an emissions tax, set at the right rate, will theoretically produce the same outcomes in emissions and welfare as a cap-and-trade scheme. The two methods would incur different transaction costs, but general equilibrium models can not accurately convey this. The report stops short of concluding whether the least-cost, broad-based mechanism would be a carbon tax or a cap-and-trade scheme. The analysis limits itself to a comparison of the carbon price certainty of a tax and the certainty about the level of emissions provided by a cap-and-trade scheme.

### **Concluding remarks**

We note that economic modelling has inherent limitations, such as the assumptions used. Notwithstanding this, we agree with the general recommendation that the long-term policy response should be a broad-based emissions trading scheme. We note that economic modelling has inherent limitation. Emissions reduction is possible, but we consider that the report should be used alongside other information when making policy recommendations.

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**Recommendation**

4 We recommend to the Government that a full and comprehensive regulatory impact analysis be undertaken preliminary to any amendment to the Climate Change Response Act 2002.

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## 5 Emissions trading scheme or a carbon tax

### Introduction

We acknowledge that some form of price-based mechanism is considered to be an effective and efficient way to meet the objective of transitioning the New Zealand economy towards being part of a carbon-constrained world and managing a changing climate at least cost to society and the economy.

In this chapter, we examine the relative merits of an emissions trading scheme or a tax on carbon or energy as a New Zealand response to climate change. We focus on the common design features of both instruments as well as the differences, and conclude by signalling our preference for an emissions trading scheme rather than a carbon tax.

### Submissions

We heard from submitters who gave reasons to support one instrument over the other. Those in favour of an emissions trading scheme argued that emissions reductions, or certainty of emissions reductions, are better under an emissions trading scheme, and that there is not enough time to change the instrument.

Those favouring a carbon tax commented that a carbon tax is more suitable for raising Government revenue, that an emissions trading scheme has too many technical and administrative costs and creates risks of speculation in the carbon market, and that more economists favour a carbon tax. We were advised that many economists support a tax. However, officials did not know whether more economists favour a tax or an emissions trading scheme.

We note that both instruments put a price on greenhouse gas emissions and incentivise behaviour, and that the design choices will be a determining factor in how the chosen instrument will perform in practice.

### Differences between the instruments

A carbon tax and emissions trading scheme differ in the mechanism through which the price on emissions is set. Under a carbon tax, regulators set the price per unit of greenhouse gas emissions and therefore the tax rate. The regulator then collects revenue from the liable parties. Under an emissions trading scheme, the price on emissions is set by the market. Under the Kyoto mechanism, regulators set a permissible level of total emissions, which is distributed among emitters in the form of Assigned Amount Units (AAUs). In domestic schemes, regulators may choose to devolve emissions units or permits. A scarcity of these permits creates a price. Permits will not necessarily be issued to emitters. The New Zealand scheme design allows permits to be acquired from offshore, and permits will only be distributed to trade exposed entities. Emitters that keep their emissions below the level covered by the permits they hold can sell their surplus to other emitters.

Under both instruments, participation in the international emissions market is subject to the framework established under the Kyoto Protocol, by which Kyoto-compliant emissions can be bought and sold. Under a carbon tax, the New Zealand Government alone would be responsible for ensuring that sufficient emissions units were purchased for the country to meet its Kyoto obligations. Under an emissions trading scheme, the Government could pass on liability for purchasing Kyoto-compliant emissions units to private entities. The New Zealand scheme design allows permits to be acquired from offshore and to be distributed to pre-1990 forestry, post 1989 forestry (opt-in), and fishing, as well as trade exposed industry and agriculture. Under a tax, the Government, and ultimately the general taxpayer, bear the cost of these uncertainties.

## Design issues

Emissions trading schemes and carbon taxes are both market-based instruments for reducing greenhouse gas emissions. We considered their application as policy instruments by examination of their design options and how they could be applied most effectively to New Zealand's circumstances.

While both instruments are mechanisms for pricing emissions and they have some common design features, the degree of stringency, or the amount of effort emitters must put into reducing emissions, can be adjusted. An emissions trading scheme can be made more stringent by reducing the total quantity of permissible emissions units available. New Zealand firms could offset their emissions through the purchase of international units, or (as well as households) would reduce domestic emissions by not purchasing goods (electricity, petrol etc.), or pay the increased price. A carbon tax can be made more stringent by setting a high tax rate.

Carbon taxes and emissions trading schemes can cover either a broad or narrow emissions base—both may be confined to a single sector or a single greenhouse gas. As a general rule, the wider the coverage of the instrument, the more cost-effective reductions in emissions are likely to result.

We considered where in the supply chain it would be best to impose the “point of obligation”, or the duty to pay a carbon tax or surrender emissions units. We understand that is not necessary for the point of obligation under either an emissions trading scheme or a carbon tax to be correlated with the receipt of assistance for adjusting to emissions pricing.

In general, it is desirable to place the point of obligation so as to limit the number of participants in the scheme, while still providing incentives to change behaviour and reduce emissions.

For the energy and liquid fossil fuels sectors, the most suitable point of obligation is likely to be upstream, at the point of fuel supply, production or importation (an upstream point of obligation). The cost of emissions would be passed on through fuel and electricity prices to the downstream users of these products, avoiding the situation where individual motorists would have obligations for emissions from their vehicles. Likewise the point of obligation for the industrial processes sector would be the industrial producers themselves, the direct source of emissions.

For the agriculture sector, placing the point of obligation at the farm level—the direct source of emissions—would provide the best incentive to reduce emissions. However, there are currently practical and administrative impediments to requiring individual farmers to measure and report their emissions. It is therefore desirable for the point of obligation to initially be set at the processor level, which would place obligations on only a small number of firms. The price impacts are likely to be passed through to farmers.

We considered an upstream approach to regulation, which would impose liability on those who produced or imported sources of emissions. The attraction of this approach is the smaller number of more sophisticated parties it would cover, allowing a price signal to flow downstream to influence behaviour. We consider that an upstream point of obligation might be the most suitable for the liquid fossil fuels and stationary energy sectors in New Zealand. In the context of liquid fossil fuels and stationary energy sectors, a downstream approach would mean regulating more emitters, which can incur higher transaction and administration costs. On the other hand, this approach would involve downstream emitters more directly, which may encourage them to respond more readily to a price signal. We consider that a downstream point of obligation is more suitable for the agriculture sector.

Depending on policy settings, either scheme may generate revenue for the Crown, which could be used to either reduce other forms of taxation, to provide better Government services, or to further assist in responding to New Zealand's climate change challenges. That is, over and above any costs that the Crown may incur in meeting New Zealand's obligations in an international agreement.

Both an emissions trading scheme and a tax on carbon would result in requests for assistance to smooth adjustment to a price-based carbon-constrained economy. New Zealand producers whose products competed internationally with goods produced in markets without a price on emissions could be placed at a competitive disadvantage.

We considered the level of assistance that might be appropriate, how long to provide it, and to what extent it should be targeted to those most affected. Either an emissions trading scheme or a carbon tax can be designed to provide assistance that is more or less generous, longer or shorter in duration, and targeted or broad. The impacts of a carbon tax could also be reduced by covering a broad range of emissions with a low tax rate. The same result could be achieved under an emissions trading scheme where all emitters surrendered units for only a proportion of their emissions.

A carbon tax might mean more certainty, especially in the short term, regarding the price of emissions if the Government kept the tax rate constant. An emissions trading scheme would provide more certainty over emissions reduction. A level of price certainty for participants (but not the Government) could be achieved under an emissions trading scheme using a price cap. Whatever instrument is chosen, price certainty would be ultimately dependent on the promises regulators made and whether they kept them when international and domestic emissions prices diverged.

## **Recommendation**

5 We recommend to the Government an upstream point of obligation as the most suitable for the liquid fossil fuels and stationary energy sectors. For the agriculture sector,

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while it is preferable in the long term for the point of obligation to be at the farm gate, we recommend that it is initially set at the processor.

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### **Choice of instrument**

We consider that an emissions trading scheme is more effective and is thus the preferable response for New Zealand. Our preference for an emissions trading scheme sits in the context of New Zealand's being a party to the Kyoto Protocol, which creates an international emissions trading framework.

The NZ ETS received widespread support during public consultation in 2006 and during its consideration in 2007 and 2008. With an internationally-linked emissions trading scheme, the price of units tracks the international price of emissions. The aggregate quantity of net emissions is set, and the international market determines the price of emission units, and thus the cost per unit of emissions to firms and individuals. Emissions trading provides more flexibility for compulsory participants, particularly forestry participants, who must manage price risks over long periods. We note that emissions trading schemes are emerging as the preferred response to climate change internationally.

Putting a price on greenhouse gas emissions by way of an emissions trading scheme assigns a cost to emissions, thus creating a financial incentive to reduce emissions. Emissions trading is a market-based mechanism which limits the amount of emissions permitted, and allows the buyers and sellers of emissions permits to establish a price for them. Participants are required to surrender emissions units annually to cover their liabilities.

Emissions trading is increasingly the favoured worldwide approach to introducing a price on greenhouse gas emissions. An emissions trading scheme would be more economically efficient than a tax, because it would allow New Zealand to access the international emissions market which generates changes in emissions prices. Incentives to reduce emissions could thus respond far more easily to changes in the international price of emissions. Under a tax, there would be a lag while the regulator changed the tax rate, and the resulting mismatches between the international and domestic emissions prices would mean the New Zealand economy would either forgo economic emissions reductions units or take on uneconomic ones. The carbon tax process lacks transparency, because regulators cannot predict the international price of emissions with any certainty. An emissions trading scheme would ensure that, in the long-term, should a fully liquid global market develop, New Zealanders did not overpay or underpay for their emissions relative to other countries.

Emissions trading offers more flexibility for emitters, allowing them to sell or bank units. Under a carbon tax, the emitters' only options are to reduce emissions or pay the tax. An emissions trading scheme would give emitters a choice of reducing emissions, surrendering emissions units already held, or purchasing units in a competitive marketplace, thereby funding less expensive reductions in emissions by other parties. Emitters could also choose to sell excess units, or bank them for future use or sale, subject to banking restrictions.

The forestry sector represents a large part of New Zealand's emissions profile. It is important that these emissions be covered by the instrument chosen. Some submitters noted that a carbon tax could accommodate forestry. However, an emissions trading

scheme would allow the devolution of forest credits and liabilities to owners, allowing them to manage price risks over time, which cannot be achieved by a carbon tax.

### **Concluding remarks**

Carbon taxes and emissions trading schemes can be very similar instruments, depending on their design. Despite the similarities of the instruments, however, public acceptability, economic efficiency, flexibility for participants, and an international trend towards the adoption of emissions trading schemes are reasons to prefer an emissions trading scheme for New Zealand in the present context.

The Kyoto Protocol has created a framework for international emissions trading, from which domestic emissions trading schemes are emerging throughout the developed world. An emissions trading scheme would provide New Zealand with opportunities to link to other markets. The earlier New Zealand adopts an emissions trading scheme, the sooner and more readily it can access emissions reductions internationally, and export knowledge and services related to emissions trading.

While a price-based mechanism will be a major element of any domestic mitigation policy, the case will remain for short- to medium-term measures to manage the transition to a comprehensive price-based measure and additional domestic mitigation mechanisms. Any short- to medium-term measures to manage the transition will be influenced by the design of the price-based mechanism.

### **Recommendation**

6 We recommend to the Government that New Zealand pursue an emissions trading scheme as the primary economic mechanism in its response to climate change. (*Opposed by the Māori Party and the ACT New Zealand Party.*)

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## 6 Design of NZ ETS

### Introduction

In this chapter we address specifically two of the terms of reference that have a bearing on the design of the NZ ETS. We were asked to consider the impact on the New Zealand economy and New Zealand households of any climate-change policies, having regard to the weak state of the economy, the need to safeguard New Zealand's international competitiveness, the position of trade-exposed industries, and the actions of competing countries. We were also asked to consider the timing of the introduction of any New Zealand measures, with particular reference to the outcome of the December 2009 Copenhagen meeting, the position of the United States, and the timetable for decisions and their implementation by the Australian Government.

We have focussed in this chapter more particularly on the factors that would influence the design of an emissions trading scheme for New Zealand, specifically its core design features, the emissions reduction targets that have been set by the New Zealand Government, the ability for New Zealand's scheme to link with international trading schemes, price caps and price protection to mitigate price volatility, trade barriers and trade protection, New Zealand's emissions profile, and possible governance arrangements.

### Core features of an emissions trading scheme

The core design features, including the coverage, of an ETS should preferably be set on the basis of ideal market circumstances in the long-term. However, it is important to acknowledge that transitional measures are required until the utopian position can be reached. An ETS would affect the structure of the economy in several ways, as the economy became less emissions-intensive, transforming a number of economic processes. An ETS would tend to create incentives for the following effects on the economy as a whole:

- efficiency gains from adopting more efficient technology and low-emission management practices
- innovation resulting in the introduction of lower-emission technology
- substitution responses where lower-emission products such as timber are substituted for others, such as concrete construction materials (Efficient substitution responses require an emissions trading scheme to cover a broad range of sectors.)
- changed output patterns where firms may not be able to pass on costs because consumers are unwilling to pay more, and other firms are likely to be relatively more economic and will grow as a result
- no change where consumers are willing to pay or producers are willing to absorb the cost.

A broader scheme would allow individual firms greater opportunities to access least-cost abatement options and promotes a more efficient economic transformation by reducing

the overall cost of abatement. A broader scheme is also expected to be more effective in achieving abatement across a greater number of sectors, enabling firms to become more efficient, and helping in reducing costs. It would not be desirable on equity grounds for any sector to be excluded, and hence subsidised by other sectors and by the taxpayer.

On the basis of long-term trends in markets and international circumstances, we consider that a broader ETS would lower the overall costs of abatement and deliver more economic transformation, and would be more consistent with equity.

### **Recommendation**

7 We recommend to the Government that on the basis of long-term trends in markets and international circumstances, all sectors be included in a broad emissions trading scheme so that no sector is required to be subsidised by others in the longer term, or by the taxpayer.

### **Targets for reducing emissions**

New Zealand has committed to a global goal of stabilising emissions at not more than 450 ppm of CO<sub>2</sub> equivalent. A long-term goal has been set for reducing New Zealand's net emissions to 50 percent of 1990 levels by 2050.

On 10 August 2009, the Government announced an emissions reduction interim target range of 10 to 20 percent below 1990 levels by 2020, if there is a comprehensive global agreement. This would mean that

- the global agreement set the world on a pathway to limit temperature rise to not more than 2 degrees Celsius
- developed countries made comparable efforts to those of New Zealand
- advanced and major emitting developing countries took action fully commensurate with their respective capabilities
- there were an effective set of rules for land use, land-use change and forestry
- there was full recourse to a broad and efficient international carbon market.

### **Comparison of 2020 target with those of other countries**

The table below shows the targets announced by a number of other countries, ranging from a return to 1990 levels (the United States administration's target to 30 percent below 1990 levels, Norway, and the EU's conditional target).<sup>7</sup>

New Zealand's national circumstances—including our emissions and economic profile—mean that it is fair for New Zealand to offer a responsibility target for greenhouse gas emission reductions of between 10 and 20 percent below 1990 levels by 2020, in the context of an agreement which sets the world on a pathway to limit warming to 2 degrees Celsius. International estimates show that New Zealand has costly mitigation potential

<sup>7</sup> *Note:* All emissions data in the table is exclusive of land use, land use changes and forestry. Sources: 2009 National Greenhouse Gas Inventory, submissions to the inquiry, UNFCCC (developed countries), Climate Analysis Indicators Tool, World Resources Institute (developing countries and world).

relative to other developed countries and has had, and is likely to continue to have, high population growth over the period 1990 to 2020.

Country	% of world emissions 2007	% of change 1990 to 2007	Announced 2020 target (relative to 1990 levels)	Announced 2050 target
<b>Developed countries</b>				
<b>New Zealand</b>	0.2%	22.1%	A responsibility target for greenhouse gas emissions reductions of between 10 and 20% below 1990 levels by 2020, if there is a comprehensive global agreement and other conditions important to New Zealand are met	Reduce emissions by 50% below 1990 levels
<b>Australia</b>	1.4%	30%	4% reduction unilaterally; 14% reduction conditional on efforts by major economies; about 24% reduction conditional on adequate global agreement.	Reduce emissions to 60% below 1990 levels.
<b>Canada</b>	1.9%	26.2%	About a 3% reduction.	A reduction of about 50-65% on 1990 levels.
<b>EU-27</b>	13%	-9.3%	20% reduction unilaterally; 30% reduction conditional on other countries' efforts.	-
<b>UK</b>	1.6%	-17.3%	34% below 1990 levels (except for HFCs, PFCs, and SO <sub>2</sub> , which use 1995 base year). Will be increased if the EU commits to 30% by 1990.	Reduce emissions by 80% below 1990 levels
<b>Germany<sup>8</sup></b>	2.5%	-21.3%	40% below 1990 levels, assuming EU target is 30% below 1990 levels and other countries adopt ambitious targets.	-
<b>Japan</b>	3.5%	8.2%	8% reduction (domestic reductions only)	Reduce emissions to about 55-80% below 1990 levels

<sup>8</sup> The UK and Germany are incorporated within the EU. The EU negotiates as a block in the UNFCCC.

<b>USA</b>	18.3%	16.8%	Return to 1990 levels (0%)	Reduce emissions to about 80% below 1990 levels.
<b>Developing countries</b>				
<b>China</b>	20.3%	120.5%	Countries have agreed to protect the climate system on the basis of equity and according to their differing responsibilities and capabilities. Developed countries have agreed to take the lead. As developing countries' emissions and wealth grow, they will need to take in a share of the global effort.	
<b>India</b>	5.1%	79.9%		
<b>Brazil</b>	2.7%	54.7%		

### Impact of emissions trading scheme on abatement by 2020

An emissions trading scheme will not affect the level of global abatement after the cap has been set. Global abatement refers to the amount of abatement under the Kyoto Protocol or any post-2012 international agreement. Under Kyoto, New Zealand has agreed to reduce its total contribution to global emissions to the level of its target (five times the level of 1990 emissions over the first commitment period, 2008 to 2012). The target is sometimes referred to as a “responsibility target,” because New Zealand is responsible for offsetting domestic emissions by buying international Kyoto units. This means that New Zealand’s contribution to global abatement is fixed at the difference between business-as-usual emissions and New Zealand’s target. An emissions trading scheme would not affect the degree of global abatement but would devolve part of New Zealand’s international responsibility, and associated cost, from the Government to participants.

Domestic abatement is that which occurs in New Zealand, and does not include offshore abatement through surrender of Kyoto units bought from the international market. The level of domestic abatement will not affect global abatement after the cap has been set. If New Zealand emits more than its Kyoto target, the Crown (or businesses) would have to buy emission units, which would generate additional abatement offshore. Conversely, if New Zealand emits less than its Kyoto target, the Crown (or businesses) may sell or bank surplus emissions units, which would allow increased emissions elsewhere, within allowed country caps, or in the future.

The emissions trading scheme would introduce a price on emissions to the New Zealand economy, so participants and consumers would face an incentive for domestic abatement, relative to business-as-usual. The precise impact of the scheme on domestic abatement, however, is uncertain. The scheme gives participants flexibility to undertake domestic abatement or surrender Kyoto units bought from the international market. The more flexibility participants have to import and export units, the more domestic abatement depends on the international price of Kyoto units.

Computable General Equilibrium modelling by NZIER and Infometrics indicates that by 2020 an emissions price of NZ\$25 would reduce emissions domestically by about 5 percent

and at a price of \$100 by about 15 percent below.<sup>9</sup> Depending on the level of free allocation in place, these reductions might be somewhat smaller.

These modelling results do not take into account the potentially quite significant mitigation from forestry. In theory emissions prices as low as \$20 could incentivise significant mitigation from forestry, possibly as high as 30 mega tonnes CO<sub>2</sub>-e in 2020. However, this is highly dependent on ongoing price and policy certainty, and may be subject to additional constraints such as land availability.

The modelling results also do not account for any endogenous technological change in response to carbon pricing, the levels of which are extremely difficult to predict. However assuming that emissions pricing gives rise to greater access to and uptake of emission reducing technologies, actual mitigation is likely to be higher than the modelling results indicate. These modelled scenarios also assume that New Zealand's export competitors do not face the relevant price on carbon.

The extent to which an emissions trading will affect abatement depends on a number of market factors, including the international price of Kyoto units, the availability of abatement technology, consumer preferences, and economic growth.

Government decisions will also affect domestic abatement. Any qualitative or quantitative restrictions on rules for importing or exporting emission units will affect the price of emission units in the scheme, and consequently incentives for domestic abatement. Price caps or floors will be influential as well. If a price cap is set, for example, the scheme will be unable to provide incentives for domestic abatement if it is more costly than the price cap.

Free allocation methods will also affect the output of businesses and consequently New Zealand's gross emissions. If free allocation is provided to an incumbent firm solely on the basis of historical emissions with no correlation to output, a firm is given a stronger incentive to reduce emissions. However, this may lead to a reduction in output from firms that are unable to pass on the full cost of carbon because international competitors are not adopting equivalent carbon pricing regimes. In contrast, if free allocation is based on output, a firm has less incentive to decrease emissions, but is provided with greater protection against competitiveness disadvantages created by the international environment. The optimal design of allocation policies will depend on which of these objectives decision-makers wish to pursue.

The Government's recently announced emissions reduction interim target range is conditional on the final shape of the new global deal to be finalised at Copenhagen and on commitments by the big emitters and developing countries. As noted by the Parliamentary Commissioner for the Environment, the target represents our contribution to the current global effort to combat climate change—it defines what New Zealand has committed itself to contributing internationally, but it leaves our combination of domestic measures and purchasing of international emissions units open to consideration.

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<sup>9</sup> The business-as-usual scenario assumes no climate change policies or international agreements, and thus no price on carbon or AAUs.

The NZ ETS will not impact on global abatement, which is fixed by the Kyoto Protocol, or any post-2012 international agreement. By introducing a price of emissions to the New Zealand economy, the scheme will provide incentives for domestic emissions abatement. However, the precise level of domestic abatement under the scheme depends on market factors and specific decisions on scheme design, as well as general responses through the economy.

### **International linkages**

The extent to which New Zealand adopts international carbon-trading linkages will determine the price of carbon to the domestic economy. International linkages give access to market opportunities overseas, allowing businesses to maximise their emissions reductions for a given level of investment, and lowering the costs of doing so. International linkages provide market liquidity. They can be implemented via the international Kyoto market or via other countries' domestic carbon trading schemes. Such linkages can operate in two directions (buying and selling), or buying only and often involve mutual recognition of emission units. Linking does not necessarily require schemes to harmonise all of their features.

The Kyoto Protocol establishes an international market in Kyoto emissions units. Each Kyoto emission unit is equivalent to the global warming impact of one tonne of CO<sub>2</sub>. Different greenhouse gases are multiplied by their global warming potential to express their global warming impact in tonnes of CO<sub>2</sub> equivalent. Annex I countries are required to surrender Kyoto emissions units to cover each tonne of their emissions from 2008 to 2012. Annex I countries can obtain some emission units free of charge, and others are acquired through flexibility mechanisms—international emissions trading, Joint Implementation, and the Clean Development Mechanism.

An emissions trading scheme can be linked to the Kyoto market either with regulations restricting import or export of emission units, or governing their quantity and type, or without any restrictions on trading.

Bilateral linking with other countries' emission trading schemes, such as the EU ETS, is also possible. The Australian Government introduced legislation for a carbon pollution reduction scheme on 14 May 2009, and emission trading schemes are also being considered in the United States, Canada, the Republic of Korea, and Japan.

International linkages should be made on the basis of market and international circumstances that are expected to obtain in the long term. Short-term market imperfections can be addressed by temporary assistance measures.

### **Domestic abatement**

The Kyoto Protocol sets a cap on emissions for Annex I parties. The cap may be exceeded only if equivalent abatement is achieved in non-Annex I countries through the Clean Development mechanism, or if equivalent carbon is removed by sinks in the land use, land-use change and forestry sector. If New Zealand's net domestic emissions (including forest sinks) exceed its Kyoto target for the first commitment period, it must purchase compensating Kyoto emissions units from the international market. If New Zealand has a surplus of net domestic emissions (that is, if it reduces its emissions by more than the

target to which it has committed), it can either sell Kyoto emissions units overseas or bank the units for its own future use. The volume of domestic emissions does not affect the overall volume of permitted emissions from Annex I parties, which is fixed by the Kyoto Protocol.

If type or quantitative restrictions are placed on unit imports, a New Zealand scheme will limit the ability of New Zealand firms to purchase emissions units generated from abatement outside New Zealand, and they would be required to reduce emissions domestically. Restricting the volume of imported emissions units will increase costs for businesses and the economy as a whole. Firms would not be allowed to fund abatement outside of New Zealand, even if international abatement were cheaper than domestic abatement. The EU ETS restricts the permissible importation of emissions units in order to increase domestic abatement. For this reason, the market price of emissions units in the EU ETS is higher than the international price. The Kyoto Protocol cap means that any additional abatement in New Zealand would permit additional emissions offshore, so there is no global benefit from restricting the volume of emissions unit imports.

There is an argument for promoting higher-cost domestic abatement in New Zealand by restricting international linkages, since it is likely that our international obligations will become more stringent over time. Domestic investment in emissions reductions should produce long-term domestic dividends. However, we consider that the choice to invest domestically should lie with businesses, since they are better-placed to assess the short- and long-term costs and benefits on their businesses of domestic versus international investment in emissions reductions. The overriding concern should of course be New Zealand's long-term interests. It is in the global interest to reduce emissions as much as possible for a given level of investment, and this purpose is supported by linking trading schemes internationally.

We considered the importance of factoring in New Zealand asset base issues, in New Zealand's climate change response and scheme design. Factors to consider in determining our domestic response to climate change while protecting our domestic asset base include

- our long term emission-reduction trajectory
- the extent to which we want to reduce our domestic emissions profile
- the extent to which incentivisation of New Zealand-created "clean sector" technology will enhance our economy
- the extent to which attracting talent, skills and employment, and technology will create future growth
- prospects for incentivisation to accelerate emissions reductions
- carbon leakage issues
- prospects for our primary production sector as a result of the requirement to increase value of exports through energy intense processing to increase GDP
- the extent to which other resources influence the strategic positioning of New Zealand's primary produce.

We also considered the options for an optimal roll-out of complementary measures to help wider New Zealand to adjust to a carbon-constrained economy, and whether an analysis should be prepared of incentives which have been considered or introduced overseas, to establish what complementary measures and incentives may be appropriate in a New Zealand context.

### **Rationale for international linkages and an “open” emissions trading scheme**

Inclusion of a wider range of abatement opportunities would reduce the overall cost of abatement, and make economic transformation more efficient. Providing for “openness” in international linkages is likely to be more economically efficient: firms would have better access to international unit markets and coverage of the scheme would be broader. Excess emissions reductions could be sold overseas, and measures to reduce emissions would be further influenced by the international price of emissions units. International linkages do not prevent incentives, but do disincentivise domestic abatement where the global cost is lower. International linkages also lower the overall cost of abatement, while delivering the same global environmental outcome.

We heard arguments that international linkage may make prices volatile and difficult to control. However, assuming full access to all units and a level playing field, international linkages may in fact reduce price volatility. In general, increasing the number of participants in trading increases supply and demand, creating a more liquid market, and making a particular emissions trading scheme likely to function more efficiently. Where unit types or market pool are constrained, additional costs may arise. The constraint on international linkages for the EU ETS has led to very volatile prices in the past, because emissions unit prices in a closed market are very sensitive to internal allocation decisions. Even if only larger companies can realistically participate in international emissions unit markets, international liquidity will improve the local liquidity in a New Zealand scheme. Access to international markets for smaller participants can be facilitated by intermediaries acting as brokers or agents.

Reducing the volatility of the price of emissions units reduces the financial impact of an emissions trading scheme, and creates more certainty for business. It may be necessary to reduce the impact on New Zealand firms of volatile prices on the international market during the transition phase.

International linkages help keep the domestic market aligned with international markets, which means that the cost of emissions in a global context is more accurately reflected in a firm’s production costs. In the absence of a global agreement, offshore exposure to international emissions unit pricing introduces market distortions and competitiveness issues, which may be addressed through transitional measures such as allocation.

There will be opportunities for New Zealand to align its emissions trading scheme with other countries, either indirectly via the international market in Kyoto emissions units or directly through bilateral linkages. Bilateral linking would involve the import and export of emissions units between a New Zealand scheme and another country’s scheme. Bilateral linkages would require that emissions unit were compatible and freely exchangeable between schemes.

### **Linking the Australian Emission Unit with the New Zealand Unit**

Different degrees of harmonisation with the proposed Australian scheme are possible, ranging from the parallel use of similar design features to full integration into a single scheme. This chapter does not refer to the impact of price caps, and in particular, issues for forestry and Māori, which are discussed in chapters 6, 8, and 9 of this report. As at August 2009, we note that the Australian Government has not yet been able to pass legislation giving effect to the proposed scheme.

To enable direct linking between the NZ ETS and the proposed Australian scheme, a number of features would need to be aligned. The exchange of AEU and NZU would need to be backed up with transfers of AAUs, or other Kyoto units, to ensure that transfers were reflected in the two countries' respective Kyoto liabilities. The Climate Change Response Act, as amended in 2008, ensures NZUs are converted to AAUs for the purpose of export to other countries. A "true up" commitment could be established whereby one country agreed to reimburse the other at a specified point with AAUs equivalent to the number of NZUs or AEU that had been transferred to their registry. Both Governments would need to consider how AAU transfers were affected by current international rules regarding the commitment period reserve, which specify that countries with emissions above their target level must maintain AAUs equivalent to 90 percent of their expected liability at any time.

### **Alignment of import and export rules**

Linkage with Australia would also require the alignment of import and export rules. New Zealand would need to align the following:

- **Rules governing the import and surrender of AAUs** Under the proposed CPRS, AAUs could only be surrendered if they meet conditions prescribed in regulations (not yet developed).
- **Rules relating to the transitional fixed-price period** The proposed CPRS would operate at a fixed price during the first year of operation, during which the Government will issue an unlimited number of units for immediate surrender at a fixed price.
- **Rules governing price caps** If the two schemes were to be linked during the five transitional years, and a similar price cap was not implemented under the NZ ETS, Australian taxpayers could end up subsidising compliance in New Zealand.
- **Rules governing the export of AEU and NZU to third markets** Allowing the export of NZUs to markets other than Australia while the price cap remained could result in the Government subsidising windfall profits if international prices rose above the level of the cap.

### **Australian criteria for bilateral links**

Australia has indicated that any scheme to which it will link must be of a suitable standard, meaning it must include

- an internationally acceptable level of mitigation commitment
- adequate and comparable monitoring, reporting, verification, compliance and enforcement mechanisms

- compatibility in design and market rules.

Additionally, a minimum of five years' notice must be given before a bilateral link with another country's scheme is established, except where an independent review has been conducted, with consultation of stakeholders, and has found that the link will not have a significant impact on the proposed CPRS permit price—the price paid for carbon pollution permits for every tonne of emissions produced each year. The responsible Minister can also waive or shorten the notice period.

#### **Restricting international linkages for bilateral linking**

Linking bilaterally with another country's scheme may require restrictions on other international linkages with both schemes, limiting, for example, the extent to which they individually or jointly link with the international marketing Kyoto emission units. Emissions trading schemes that prohibit importing certain emissions units, or apply price caps, for example, would effectively require a linked scheme to apply similar mechanisms.

#### **Restricting international linkages in the interests of environmental integrity**

Restrictions on types of emissions unit imports and exports may be applied in the interests of environmental integrity. Different emissions units are generated from different forms of abatement. The import and export of certain units under an ETS might be restricted because certain forms of abatement were not recognised as environmentally sound.

Under the NZ ETS, imported AAUs cannot be surrendered for compliance purposes unless they meet conditions or requirements specified in regulation. No regulations have yet been made. Accordingly, at present, imported AAUs cannot be surrendered under the NZ ETS. However, regulations could be made specifying that certain types of imported AAUs would be acceptable under the NZ ETS.

The reason that imported AAUs were singled out for special treatment under the NZ ETS is that some parties are concerned about the environmental integrity of AAUs from Eastern European countries. One possibility, which was publicly signalled by the Government in October 2008, is to allow imported AAUs to be surrendered where the units have been appropriately "greened". For example, imported AAUs would be considered acceptable where the seller country has legislation in place requiring all revenue from AAU sales to be invested in emissions reduction or other environmental projects.

The possibility of allowing imported AAUs into a New Zealand ETS raised concern about "hot air" for some submitters, who referred to the allocation of AAUs to eastern European countries whose emissions declined after the base year for allocation because of economic recession, rather than investment in lower-emission technology and practices.

Arguments for accepting AAUs are based on reducing costs, and the assertion that all AAUs are legitimate units covered by the Kyoto emissions cap and are therefore fully tradable. Signatories to the Kyoto Protocol had full knowledge of the implications of these AAU allocation decisions. Purchasing and surrendering AAUs reduces the ability of others to emit, and it is arguable that there is hot air in the inventories of many developed countries, not just those in eastern Europe. Equity and efficiency concerns could arise if an emissions trading scheme precluded participants from using imported AAUs to meet their

obligation, but the Crown used imported AAUs for its international obligations. However, there are also arguments to suggest it would be easier to manage the environmental quality of imported AAUs if purchasing were carried out by the Crown. In addition, this approach has an international precedent in that the EU ETS prohibits the use of imported AAUs, but individual governments within the EU are engaged in purchasing AAUs to meet their international obligations.

The inclusion of AAUs in a New Zealand ETS could pose a barrier to bilateral linking with other schemes that prohibit such units. The EU ETS, for example, and proposed legislation for the Australian CPRS, prohibit the surrender of AAUs. If a decision is made to allow participants to surrender AAUs under the NZ ETS during the first commitment period, linking an emissions trading scheme to either of those schemes post-2012 could be facilitated by prohibiting them from surrendering imported AAUs issued during the first commitment period of the Kyoto Protocol to meet obligations accrued after this period. This option is provided for in the Climate Change Response Act as amended in 2008.

Different types of emissions units have different prices. If there are restrictions on the types of units that can be imported, this may increase costs for business and the economy as a whole. Therefore, participants in the scheme would be likely to miss least-cost abatement opportunities that exist offshore.

### **Benefits of international linkages**

We consider that international linkages between a New Zealand ETS and other Kyoto-compliant schemes, either directly or indirectly, would lower the overall cost of abatement, and deliver economic transformation more efficiently. They would also help to ensure liquidity, allowing the efficient functioning of an emissions trading scheme. It should be noted, however, that international linkages can both expose business to any price volatility on the international market, and help buffer price volatility in the domestic market.

Bilateral linking may produce additional benefits beyond those realised from indirect linking to the international market in Kyoto emissions units. However, the merits of any bilateral arrangement would need to be assessed case by case.

Restrictions on international linkages to the broader Kyoto compliance market may be applied to facilitate bilateral linking, to achieve domestic abatement, or in the interests of environmental integrity. There may also be reasons for limiting international linkage in the short- to medium-term while the New Zealand emissions trading market matures.

Whether to accept imported AAUs into a New Zealand ETS will be a major decision. Doing so would lower the costs of the scheme, but might restrict our ability to link with other schemes such as the EU ETS or any Australian scheme. Another consideration is the equity issue of whether the Government can purchase units more cheaply than ETS participants, and the resulting arbitrage issue that will arise for the Crown. We understand that the different unit purchasing characteristics of the Crown and NZ ETS participant buyers creates an arbitrage opportunity for the Crown, which is likely to be material. It is necessary, however, to provide some certainty regarding the types of unit to be accepted into the NZ ETS, if only for the short term.

## Recommendation

8 We recommend to the Government that international linkages be adopted between a New Zealand emissions trading scheme and other Kyoto-compliant schemes that would lower the overall cost of abatement with environmental integrity and deliver economic transformation more efficiently.

### Price volatility, price caps, and price protection

Another concern raised by submitters was possible volatility in the price of emission units. Businesses generally have to manage volatility in various prices, including exchange rates and oil prices; but there may be extreme price volatility in the early years of an international emissions market, and there is uncertainty about the outcome of international negotiations on a post-Kyoto agreement. This uncertainty has resulted in a lack of forward pricing in the international carbon market. This creates uncertainty for firms with respect to the costs they might face in future years. Price volatility could also exacerbate risks to competitiveness.

There are two main ways of managing price volatility: a carbon tax or an emissions trading scheme with a price cap or price floor. As both instruments can be designed to manage price volatility, this should not influence the choice between them, but is a design option for the preferred mechanism.

In the context of meeting New Zealand's international obligations, if the Government attempted to smooth prices for emitters by using an emissions trading scheme with price caps and floors, or maintaining a carbon tax rate that did not closely track the international emissions price, economic costs might be incurred; either overseas emission units would be purchased more expensively than emissions reductions could be effected in New Zealand, or New Zealand would undertake more costly emissions reductions than could be purchased overseas. Many commodity markets are volatile, but the Government does not necessarily act to manage price risks for business and consumers.

There are other options for mitigating price volatility. Those surrendering emission units under an emissions trading scheme would not necessarily be buying the units on a day-to-day "spot market" basis (although this is may be an option). Emissions units could be bought under forward contracts for a fixed price. Participants could also invest directly in Clean Development Mechanism or Joint Implementation projects, which generate Kyoto-compliant emissions units (CERs and ERUs).

In forming their views on the potential for price volatility under an emissions trading scheme, submitters may have considered the price history of EU ETS emissions units. We note the need for care in drawing parallels between the EU experience and what can be expected under an emissions trading scheme in New Zealand. Certain features of the EU ETS have contributed to price volatility, including restrictions on banking emissions units from the first phase and an over-allocation of emissions units, especially in phase one. While the EU ETS has historically influenced the price of secondary CER units, as more countries start entering the international market this impact is likely to lessen.

The free allocation of units to trade-exposed firms would help them manage the effects of any price volatility that their competitors did not face. A free allocation would limit the

number of emissions units a firm needed to buy. Not all recipients of allocations will be direct participants in the emissions trading scheme. Rather the allocation is designed to shield them from the cost impacts. Therefore, while they might encounter some price volatility at the margin, they would not be exposed to the full impact of volatile prices.

Since the concerns are about extreme price volatility and the risk of spikes in carbon prices in the short term, some of us believe a case can be made for a short-term price cap. This would not shelter firms from all price volatility, but would protect them from more extreme movements in price for a period. It would provide some protection to businesses while they learnt how the emissions market worked, and while there was uncertainty about the future of this market after 2012. In addition, it would protect participants and households from high carbon prices in the short term, limiting the possible shock of the introduction of a price on carbon in the New Zealand economy. The economy as a whole still faces high carbon prices. In this scenario, households, and businesses would simply be sheltered from these by the taxpayer.

Any form of price control will have impacts on banking of units and linking. Forestry participants would be disadvantaged under a price-controlled scheme as sale of units or restrictions on their banking would restrict the value they can achieve in the short term for their NZUs, while (with pricing controls removed in the future) they would still have full market price exposure for later harvesting liabilities. This may have a disproportionate impact on Māori as well. The converse impact of a price impact on forestry is discussed in chapter 8 of this report.

The introduction of a price cap might also require consequential changes to other aspects of scheme design, such as banking and international linkages.

#### **Australian CPRS price cap**

Among other mechanisms to reduce price volatility and upside price risks, particularly during the early years of the scheme, the proposed Australian CPRS would operate under a temporary price cap from July 2012 to June 2016. The price cap will be in the form of issuance of an unlimited number of units, by the Australian Government at a fixed price. Units bought at the fixed price will be for immediate surrender only, to avoid opportunities for arbitrage (at a cost to the Australian taxpayer), which might be created by allowing the trading or banking of these units.

The price cap will be set at AU\$40, plus 5 percent real growth (using the Consumer Price Index) per year from July 2010. The Australian Government recently announced that the price cap will start in July 2012 at AU\$40, plus 5 percent real growth for 2010/11 and 2011/12. The initial level of the cap is designed to be higher than the estimated carbon price at the start of the scheme (AU\$23 to AU\$32), deterring its widespread use, which might undermine the objectives of the scheme, while protecting against extreme prices. The 5 percent real annual increase is greater than the projected growth in the international carbon price (4 percent per annum), reflecting the fact that, as the carbon market develops, there should be less need to protect participants against extreme prices.

### Forestry and price caps

A price cap in a New Zealand ETS could create a negative incentive for post-1989 forest investors in particular, depending on the level at which it is set—if it were too high, it would not have much effect. A low price cap could discourage foresters from planting, since the market demand for their units would be limited to the capped price. For example, if the price cap were \$50, foresters should have incentives to keep planting. Further, forestry is a long-term investment so, if a price cap were temporary, it would be likely to have a relatively minor effect on investment, especially since forests sequester relatively little carbon in the first one to three years and investors expect a return over several decades. The limitations on exporting units that would be required if there were a price cap would be more significant than the price cap itself. This could limit foresters' income and act as an impediment to investment in afforestation and participation in the ETS. The extent of the effect would depend on how long-term the export limitations lasted; if a price cap or export limitations were short-term, the effect could be minimal on post-1989 forest owners. We believe that it is essential that certainty for the forestry industry be legislated for as soon as possible to ensure that further planting is not inhibited.

### Recommendation

9 We recommend to the Government that certainty for the forestry industry be legislated for as soon as possible to ensure that further planting is not inhibited.

In conclusion, a case can be made for a short-term price cap to assist firms while the market is developing and maturing. The implementation of a price cap also requires controls over international linkages and banking. However, in the long term, price caps stand in the way of market development and shield business from the real price of carbon to the economy. If a short-term cap is introduced a clear exit strategy is critical for maintaining market confidence and development.

### Recommendation

10 We recommend to the Government that if a short-term price cap is introduced, a clear exit strategy is critical for maintaining market confidence and development. (*Opposed by the New Zealand Labour Party, the Māori Party, the ACT New Zealand Party, and the Green Party.*)

### Trade barriers and trade protection

Issues at the intersection of trade and climate change are attracting increasing attention. A growing body of work on the implications for trade is being compiled through the OECD, the World Trade Organisation, the UNEP, and other international think-tanks and academic institutions. Trade issues are not prominent in the Bali negotiating mandate, but the Bali Action Plan does address the economic and social consequences of countries' responses to climate change. The trade-related discussions relate to matters that fall into three main categories:

- measures supporting negotiated climate-change action, such as reducing trade barriers to climate-friendly commodities

- measures addressing “carbon leakage” or competitive risks, arising where trading partners have no constraints on carbon in their economies, for example, through domestic allocation mechanisms under emissions trading schemes
- border taxes, which have strong political impact, but can constrain free trade and be economically inefficient and technically difficult to implement

Implications for market access arising from the effects of changing consumer preferences and customer demands in response to concerns about climate change such as carbon footprinting and labelling, may create de facto standards that escape legal challenge by trading partners as they are not imposed or regulated by Governments.

Although indicators such as the extent of the use of sustainability criteria such as CO<sub>2</sub> emissions from cars, in advertising and labelling, and carbon neutrality claims can indicate the commercial judgement of firms regarding emissions-related consumer preferences, it is inherently difficult to measure a country’s trade risks.

We understand that climate change issues were considered by trade Ministers in Bali in 2007. Negotiators at this stage favour establishing incentives rather than sanctions. But it is clear that any country that chooses not to participate in a future international agreement may be at risk of some form of economic retaliation. The Director-General of the World Trade Organisation has discouraged countries from looking to the WTO to solve the climate-change problem, saying that the WTO would engage in the debate, but only after the achievement of a multilateral climate change agreement, because it is likely that changes to the WTO rules could result in the medium term.

### **Border tax adjustments**

The Kyoto Protocol does not endorse or provide for border tax adjustments. Annex I countries are left to manage their own domestic policies in such a way as to minimise adverse effects, including any on international trade.

The EU decided not to introduce border tax adjustments in its climate-change legislation, and the US Senate is currently considering clean energy and climate change legislation that includes the use of border taxes. Legal analysis shows border tax adjustments to offset competitiveness concerns may technically, in some cases, be permitted under international trade rules. It is not clear whether such adjustments could actually be designed or implemented in a manner that was consistent with WTO rules, not least because there is no precedent.

If New Zealand were to impose a unilateral border tax adjustment, it would be likely to draw adverse international attention and meet challenge in the WTO. A border tax could address competitiveness concerns, but the case for free allocation to the industrial and agricultural sectors under an ETS would need to be reviewed, along with the process for developing allocation plans in general. A border tax regime would need to cover both our imports and exports, and new legislation would be required. A border tax would also be counter-productive to any economy, especially a trade-exposed one like New Zealand that was seeking to introduce a Kyoto-style price on carbon. Border tax adjustments do not provide strong domestic incentives to reduce emissions, and Kyoto-style obligations create an economic cost on countries that do not reduce emissions.

We are concerned that New Zealand would be disadvantaged if border tax adjustments became a widely adopted mechanism.

## Recommendation

11 We recommend to the Government that any border tax adjustment be considered only as a last resort and in response to the actions of other countries.

## New Zealand's emissions profile

Emissions are generated by six main sectors: forestry, stationary energy, industrial processes (including those using synthetic gases), liquid fossil fuels, agriculture, and waste. Six greenhouse gases are covered by the Kyoto Protocol for the first commitment period: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.

In 2007 (the most recent year for which inventory data is available), New Zealand's emissions profile was as follows: agriculture 48 percent, energy (stationary energy and liquid fossil fuels) 43 percent, industrial processes 6 percent, and waste 2 percent. New Zealand's emissions profile is notably different from that of most other developed countries, where the energy and industrial sectors tend to be the dominant sources of emissions. Contrasting with New Zealand's emission profile, agriculture accounted for 16 percent of global emissions in 2005 (excluding the land-based sector).<sup>10</sup>

The timing of implementing an ETS will affect the overall costs of reducing emissions in the long term. An Australian Treasury analysis has found that when countries delay action, the short-term benefits are quickly outweighed by additional long-term costs.<sup>11</sup> Furthermore, it concluded that costs are higher for economies that delay introducing emissions pricing, or become more relatively emissions-intensive, and so may incur greater costs when an emission price is eventually introduced.<sup>12</sup>

It follows that a key design feature of New Zealand's ETS is the question of coverage. In chapter 7, we examine the likely impact of the entry into the scheme of each sector and the arguments for staged entry sector-by-sector.

## Regulatory function

### Current organisational structure

Functions regarding climate change are currently divided between a number of agencies.

**Policy functions** involve decisions on rules and the features of an emissions trading scheme, which will affect stakeholders and the wider public, and involve significant risk to the Crown (including fiscal risk). They are managed with a high degree of ministerial control or oversight. Policy advisory functions are undertaken primarily by the Ministries for the Environment, and of Agriculture and Forestry, and Transport, on behalf of the

<sup>10</sup> World Resources Institute CAIT database.

<sup>11</sup> Presentation by the Australian Treasury, "Australia's Low Pollution future: the economics of climate change mitigation", made in New Zealand, February 2009.

<sup>12</sup> Australian Treasury, *Australia's Low Pollution Future: The Economics of Climate Change Policy*, p. 27.

Minister for Climate Change Issues. Policy functions include general policy advice, developing data collection requirements and calculation methods, assessing international linkages, consulting stakeholders, and managing the allocation process.

**Administration functions** relate to the operation of an emissions trading scheme. Administration is currently undertaken by the chief executive of the Ministry of Economic Development. The forestry sector is managed under delegated authority via the Ministry of Agriculture and Forestry. Administration functions include managing the register of ETS participants and the emissions unit register; processing applications for unique emissions factors, recognition as a verifier and emissions rulings; monitoring and enforcement of compliance requirements; and processing emissions returns.

Determining the appropriate governance arrangements requires consideration of various factors, particularly the need for transparency and accountability. In general, high-level decisions should be made by Parliament, while many lower-level decisions could be delegated to an independent or semi-independent regulator.

### **Administering the emissions trading scheme**

It has been suggested that the emissions trading scheme be administered by an independent administrator. Given the long-term nature of an emissions trading scheme, it is important to establish solid governance arrangements for the delivery of policy and implementation functions.

Regulation of free allocation involves a decision on the overall level of free allocation within a scheme. Tests and methods must be developed for determining the number of emission units each individual firm is allocated, and they must be applied to determine particular allocations.

The Climate Change Response Act sets the overall level of free allocation for each sector and provides a process for allocation to individual recipients. Developing tests and methods for free allocation through allocation plans is to be undertaken by the responsible Minister, and this process involves public consultation. Parliament has the power to cancel allocation plans. Applying tests and methods through determinations is to be undertaken by the responsible Minister.

Decisions on the overall level of free allocation will have significant impact on the ETS and are essentially policy decisions, which should be made by Ministers and subject to scrutiny by Parliament. Decisions on testing and methods are also fundamentally policy decisions and should also be managed with a high degree of ministerial and parliamentary control or oversight.

The application of tests and methodologies for free allocation is administrative and could be managed through either a ministry or a separate agency with administrative functions. However, it may be more efficient for tests and methods to be developed and applied within a single agency.

The establishment of an independent regulator would ensure consistency with the proposed Australian CPRS, where a portion of the allocation process will be undertaken by an independent regulator. The Australian regulator's role does not cover the overall level of

free allocation, or development of tests and methods. Detailed provisions governing assistance will be set out in the establishing Act and regulations and will include tests and methods for determining eligibility for free allocation and the number of emission units each individual firm is allocated. The Parliamentary Commissioner for the Environment recommends that in a New Zealand context, “emissions assessment, compliance, and enforcement are three functions that could be done independently. But perhaps more should be”. Some of us strongly support her recommendation that the Controller and Auditor-General report annually on carbon credits.

### **Considerations relevant to organisational form**

The design of an emissions trading scheme must be finalised before considering organisational form. The most appropriate governance arrangements will depend on the specific function. The following factors should be considered when deciding on the organisational form of administration functions for an emissions trading scheme:

- the significance and importance of the functions to Government
- public and political expectations associated with the activity
- the risks associated with an agency’s functions or powers, including strategic risk to the Government and society, political risk to the Minister and the Government if things go wrong, and fiscal risk in potential monetary loss to the Crown
- the funding sources for an agency
- whether the functions are too difficult to “contract” their provision to a Crown entity
- the powers of an agency (where significant coercive powers of the State are involved, a high degree of ministerial control or oversight is required)
- whether functions are of a judicial nature.

In some cases, a high degree of ministerial oversight may be preferred for most of an agency’s functions. However, public confidence may require some aspects of decision-making to be free from ministerial influence, and these could be specified as “statutorily independent functions” in legislation.

Most administrative functions for an emissions trading scheme could be delivered adequately through various governance arrangements. Some compliance and enforcement functions, however, may be regarded as involving significant coercive powers, which ought to be managed through a ministry. Similarly, making rulings on a person’s obligations under an emissions trading scheme may require a degree of separation from ministerial influence, which could be provided for in a department (tax rulings, a similar function to emission rulings, are undertaken by the Inland Revenue Department) or a separate agency.

The Australian CPRS proposes that an independent regulator with a commission structure be established. The new agency will also serve as the Greenhouse and Energy Data Officer and Renewable Energy regulator.

**Concluding remarks**

The establishment and management of an emissions trading scheme involves a range of policy and administration functions. Determining appropriate governance arrangements requires consideration of various factors, but in general, high-level decisions should be made by Parliament, while many lower-level decisions could be delegated to an independent or semi-independent regulator. These decisions are best made once the design of an emissions trading scheme has been finalised, because appropriate governance arrangements will depend on the exact nature of the functions to be carried out.

We consider that in order to ensure successful implementation of the emissions trading scheme, decisions on administration, including level of resources, appropriate skills sets, and detailed project planning, may need to be addressed sooner. Hence, considerations of administrative body and administrative function may need to be brought forward.

**Recommendation**

12 We recommend to the Government that direct regulation be used to provide a more targeted response to specific activities with high emissions, which may in turn accelerate changes in behaviour.

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## 7 Transition to NZ ETS

### Introduction

In this chapter we are concerned with the detail of implementing an ETS in New Zealand. The chapter broadly addresses the following terms of reference:

- To consider the impact on the New Zealand economy and New Zealand households of any climate-change policies, having regard to the weak state of the economy, the need to safeguard New Zealand's international competitiveness, the position of trade-exposed industries, and the actions of competing countries.
- To examine the relative merits of an emissions trading scheme or a tax on carbon or energy as a New Zealand response to climate change.
- To consider the timing of introduction of any New Zealand measures, with particular reference to the outcome of the December 2009 Copenhagen meeting, the position of the United States, and the timetable for decisions and their implementation by the Australian Government.

We also address the need for providing assistance to sectors most affected by the introduction of a price on carbon. In this regard, our terms of reference required that we consider the need for any additional regulatory interventions to combat climate change if a price mechanism (an emissions trading scheme or a tax) was introduced.

We do not consider the implementation of the scheme for forestry or its impact on Māori in this chapter. We focus on these issues in chapters 8 and 9, respectively.

### Cost impacts on the economy

The cost impacts of the Kyoto Protocol and ETS on New Zealand fall into three groups: wealth transfers, competitiveness impacts, and direct costs to reduce emissions.

**Wealth transfers** These would occur when New Zealand was in deficit under the Kyoto Protocol and was required to buy units from another country. There are also wealth transfers within the New Zealand economy, for example, from households and small businesses to trade-exposed large firms. Capping the price or delaying entry to the scheme could increase wealth transfers, particularly from foresters, and those investing in clean technology to large industries and farmers.

**Competitiveness impacts** These would occur when domestic firms were put at a competitive disadvantage comparative to firms in countries without a price on their emissions. Such firms would be particularly at risk of having their competitiveness undermined without receiving assistance. However, although European Union evidence may suggest that only a relatively small number of sectors are likely to suffer significant effects on competitiveness as a result of emissions trading without comparable emission

pricing among some trade competitors, care should be taken not to translate directly because of a number of differences between New Zealand and the EU.<sup>13</sup>

**Direct costs to reduce emissions** Under an ETS, New Zealand businesses would have to change their investment decisions and operational practices, possibly incurring extra costs.

Competitiveness concerns are the greatest for firms that are both emissions-intensive and trade-exposed to competition against goods produced in countries without similar emissions costs. The competitiveness of trade-exposed firms might be undermined if they were brought into an emissions trading scheme without some form of assistance.

International evidence suggests that only a few sectors, including steel, aluminium, paper, chemicals, cement, and livestock production, are likely to suffer significant effects on competitiveness from an emissions trading scheme. In a few sectors, the effect on competitiveness might be very significant.

These concerns are real, but arguments can be made against addressing competitiveness concerns by providing assistance. At present New Zealand has no means of avoiding competitiveness costs, which can be comprehensively and sustainably addressed only by coordinated international action. In practice, all allocation policy can do is shift these costs from at-risk firms or sectors to other parts of the economy (including taxpayers). This may not necessarily be in the broader economic interest, or consistent with New Zealand's international trade obligations.

The provision of assistance to the wrong firms (those not significantly at risk or those that would not be viable in the end) could increase the overall cost to the economy. It is difficult to determine exactly how firms would be affected by the introduction of a price on carbon, and how they would respond.<sup>14</sup> An assistance package would probably involve a trade-off between providing broad assistance only to the firms that New Zealand wishes to retain in the long term, and providing very targeted assistance, which risks misjudging which firms will be more beneficial to New Zealand in the future.

The arguments here are similar to those about trade liberalisation. It is in New Zealand's interests to optimise its economic structure for the international environment, regardless of whether that environment is "fair". Assistance may also lead to inconsistency with New Zealand's international trade obligations.

However, distortions in the international environment are likely to be only temporary, and it may be in New Zealand's interests to put transitional measures in place. The international climate change framework is likely to evolve over some time. NZIER and Infometrics (2009) found that "free allocation can reduce welfare losses particularly when there is only limited action by the rest of the world and there are few abatement technology options available to industry". The extent to which competitiveness concerns should be addressed through allocation policies will require a degree of judgement. There is a trade-off between

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<sup>13</sup> See Specialists Advisers' report, Box 4-2: *Observations on allocation to industry in the EU ETS*.

<sup>14</sup> NZIER and Infometrics (2009) note that it is difficult to "assess the degree to which the competitiveness of any particular industry in New Zealand is truly at risk, or for how long a period of time", p.18.

protecting the competitiveness of firms covered by the NZ ETS while ensuring that participants face the full price of carbon at the margin under the scheme.

The only practical way to protect the competitiveness of businesses in developed countries under the current Kyoto Protocol is to shelter them partly from the cost of carbon, but this comes at the cost of business and the economy adapting more slowly to a carbon-constrained world. It also risks encouraging investment in emissions-intensive infrastructure for which there would otherwise be no incentive to go ahead.

### **Carbon leakage**

The introduction of the ETS in New Zealand will increase the costs of production, particularly for emissions-intensive and trade-exposed firms. To the extent such firms could not pass on the cost increase from the emissions trading scheme, the loss in competitiveness would mean a loss of market share for these firms, and the gradual shifting of economic activity to countries without such policies. Some New Zealand sectors could suffer job losses and economic development could be hindered. The allocation provisions in the Climate Change Response Act 2002 are designed to address these competitiveness concerns as a transitional measure.

International evidence tends to suggest that competitiveness concerns are often overstated. It is also in New Zealand's interests to see its economy evolve slowly towards less emissions-intensive production systems, so some adjustment will be necessary. The level of assistance provided to firms producing emissions-intensive and trade-exposed goods has some economic weight. A less than 100 percent allocation is envisaged, with the assistance rate slowly reducing over time.

The term "carbon leakage" is frequently used to discuss the environmental effects when economic activity shifts from countries with ETS-type policies to those without. The fear is that new plant in the countries without equivalent controls will lead to similar or even higher levels of emissions per unit of output than the operations they displace. Competitiveness impacts could thus cause global emissions to rise rather than fall as a result of New Zealand introducing an ETS.

In practice though, this is not considered likely on any significant scale. While New Zealand's allocation policies are driven by economic objectives, they do not actively promote carbon leakage.

### **Assistance and impact on marginal price signals**

Business and consumers will respond to the introduction of a price on carbon in different ways. They may improve efficiency, introduce new technology, substitute goods, or reduce output or consumption. To achieve the full range of possible responses, the full price of carbon needs to be placed at the margin; the design of any assistance measure can determine whether or not this happens.

If assistance did not correlate with output or is based on historic emissions, firms would face the full price of carbon at the margin, and respond to new production decisions as though they were receiving no assistance. If assistance were related to output (that is, some form of intensity-based allocation) then the full marginal price signal for new production

would be lessened. Some of the incentives could be retained, such as encouragement to improve emissions efficiency. However, under output-based approaches, incentives for consumers to substitute goods or reduce their purchase of emissions-intensive goods would be reduced. The resulting adjustment would be less than that if firms faced the full marginal price of carbon. It is impossible, in other words, to protect competitiveness for trade-exposed producers while charging business the full marginal cost of carbon, as long as other trade competitors do not face similar emissions pricing.

### **Allocation methods**

As a starting point, it is important to recognise that free allocation could be used as a transitional measure to some sectors of the economy whose competitiveness may be at risk, because of uneven coverage and pricing of carbon across economies in the short-term, and which may otherwise be prone to carbon leakage. The importance of the pros and cons of the possible allocation approaches depend on the relative weighting placed on certain objectives, particularly the balancing of economic and environmental considerations. Some argue that avoiding carbon leakage is important from an environmental viewpoint. Others suggest that New Zealand's primary contribution to reducing global emissions will be made by meeting its international obligations efficiently and that reducing the potential for leakage is of secondary importance, irrespective of the economic consequences. Similarly, views vary on the importance of harmonisation of allocation methodologies with Australia.

### **Assessment of allocation method options**

Option	Pros	Cons
Grandparented, within a constrained capped pool (with rules to ensure that allocation ceases when firms close down).	<p>Government has full control of direct fiscal impact.</p> <p>Government has stronger influence over emission reduction trajectory.</p> <p>Strong signal to reduce emissions, especially at the margin, as no output-related subsidy.</p> <p>Incumbent firms have certainty of allocation quantity.</p> <p>Administratively, the simplest of the options, provided adequate historical data is available.</p>	<p>Risk of carbon leakage, especially in relation to new investments.</p> <p>Constrains economic growth in trade-exposed sectors. This may have flow-on economic and (indirect) fiscal impacts.</p> <p>Allocation is given to firms regardless of whether they have reduced production.</p> <p>Issuance of units depends on the processing of all applications to establish the size of the pool, that is, 90% of 2005 eligible emissions.</p> <p>Grandparented allocation becomes increasingly irrelevant over time.</p> <p>Inequitable to those whose emissions grow.</p> <p>Not aligned with Australia.</p>
Intensity-based within a constrained capped pool. Including new entrants	<p>Government has full control of direct fiscal impact.</p> <p>Government has moderate influence over emission reduction trajectory.</p> <p>Reduced risk of carbon leakage to less efficient producers and reduced risk of potential global emissions increase.</p> <p>More equitable to new players than above.</p> <p>Broadly aligned to EU ETS.</p>	<p>Individual firms' allocations are affected by other firms' (in separate industries) decisions. No certainty on future allocation.</p> <p>Could limit economic growth from trade-exposed sectors, especially if the cap is tightly constraining. Possible flow-on economic and (indirect) fiscal impacts.</p> <p>Some risk of carbon leakage.</p> <p>Not fully aligned with Australia.</p> <p>Administratively, the most complex of the options.</p>
Intensity-based no capped pool. Allocation varies with production output.	<p>Reduced risk of economic leakage with indirect fiscal benefits.</p> <p>Reduced risk of carbon leakage to less efficient producers and of potential global emissions increase.</p> <p>Firms have certainty of allocation in relation to their production output.</p> <p>Provision for new entrants on equal basis to incumbents provides equity between players.</p> <p>Allocation can be implemented on a firm-by-firm basis.</p> <p>Alignment with Australia.</p>	<p>Government has lower control of direct fiscal impact (some mitigation options exist). May well be more fiscally expensive than other options for a given level of subsidy per unit of output.</p> <p>Weak signal to reduce emissions, as output related subsidy.</p> <p>National emissions may increase relative to other options.</p> <p>Administratively complex with respect to defining intensity base.</p>

Under the current legislation, two of the objections to the fully-grandparented option are provided for. The criteria for allocation establish that if a firm reduces production, its allocation may be reduced accordingly. A contestable pool of credits is available to enable low-carbon technologies to be established and grow.

**Objectives for allocation policies**

Given that protection of competitiveness comes at the cost of their adapting more slowly to a carbon-constrained world, and encourages investment in emissions-intensive infrastructure, the following objectives should be considered when developing allocation policies:

**Fairness aims**

- grandfathering of (property) rights, such as the prior “right” to emit
- compensation for stranded assets resulting from the emissions trading scheme
- compensation for early action, for example, ensuring that those who already reduced emissions are not disadvantaged
- compensation for adverse effects, such as price increases

**Environmental aims**

- reducing carbon leakage
- incentivising specific technologies.

The optimal design of allocation policies for various sectors will depend on which of these objectives is pursued. If it is desirable to protect sectors against competitiveness disadvantage in the current international environment, an intensity-based approach will be more appropriate. Each firm’s entitlement would be updated each year as their output changed, and new entrants would be treated identically to incumbent firms. This option would see New Zealand preserve its competitive advantage in the short term while the international regime is being improved and while more countries sign up.

If it were deemed desirable to compensate firms for the impact of an ETS, but not affect their response to it, the best allocation model would determine a firm’s entitlements on the basis of output at a date before the scheme’s introduction. Their entitlement would either, if provided annually, be left unchanged, or be provided in a lump payment. Compensation would not need to be linked to a firm’s competitiveness-at-risk and could be designed to address the impact on a firm’s capital stocks (stranded assets) or loss of profitability.

If decision-makers wanted to avoid large reductions in output and unemployment, but leave businesses to face the full cost of carbon, a modified historic approach should be adopted. Businesses’ levels of entitlement would remain unchanged unless their production fell below a threshold or they ceased operation altogether.

The chosen approach might vary between sectors. An intensity-based allocation may be the most practical approach for the agriculture sector, especially if the point of obligation is the processor. The modified historic approach might not work because of seasonal production variations and changes from year to year in output.

Pre-1990 forestry has less significant international competitiveness concerns, but the introduction of a carbon price in these sectors is likely to lead to a reduction in the value of some capital stocks where a carbon price was not anticipated at the time of investment. Any assets that cannot cost-effectively be redeployed elsewhere will be heavily affected.

Competitiveness issues for fishing relate to the impact on operating costs from increased price of liquid fuels.

In these situations, the Government may wish to provide compensation for this loss of value in assets, which would also serve to uphold New Zealand's reputation as an investment destination. Such assistance could result in the transfer of wealth offshore depending on the ownership structure of the businesses that received compensation. NZIER and Infometrics (2009) noted that the result of such wealth transfers was that free allocation for stranded assets reduced real gross national disposable income, which is their preferred measure of national economic welfare.

It is also worth noting that, if the intention is some form of free allocation in the medium- to long-term, an output or intensity-based approach would address equity concerns best. The longer that free allocation is provided, the more likely it is that new firms will enter, or existing firms will expand their output. The resulting emissions would not be eligible for any assistance, which would put these firms at a disadvantage.

An intensity-based allocation decision would require a decision as to what emissions factor (benchmark) to use. Because an intensity-based model allocates units for a firm's recent or current outputs, some form of emissions factor needs to be applied to convert the output into emissions units. The same factor used to calculate a firm's obligation could be applied, or a factor representing the industry's average, or one representing international best practice. The Negotiated Greenhouse Agreement process would suggest that the more firm-specific the emissions factor for allocation, the greater the administrative difficulties.

The Government originally introduced such agreements for firms or industries that, as a result of the proposed carbon tax, faced significant risks to their competitiveness relative to producers in countries with less stringent climate-change policies. The Government entered into agreement with two firms and did extensive work with other prospective participants.

As well as decisions on the types of businesses to be eligible for assistance and the type of assistance, a decision would be needed on what cost impacts should be covered. The Climate Change Response Act covers emissions from the direct use of coal, natural gas, and geothermal energy; indirect emissions from purchased electricity; and industrial process emissions. The fishing industry receives some assistance for emissions from direct use of liquid fossil fuels.

There were requests to have the scope of industrial assistance broadened to include the cost impact of liquid fossil fuels and steam and heat purchases from cogeneration plants. Given the purpose of the scheme, it would not be appropriate to compensate fully all parties for all price rises, but any attempt to draw boundaries will inevitably result in criticism for those who miss out.

The proposed Australian CPRS contained an industry assistance package for heavily impacted industries (similar to providing compensation and assistance to emissions-intensive, trade-exposed industries) which is designed to protect competitiveness. This assistance would be allocated according to intensity, based on industry averages. Unlike the NZ ETS, there was no cap on the overall level of assistance. The CPRS proposals also

covered emissions from the direct combustion of liquid fossil fuels and higher costs for steam use.

### **Key comment**

New Zealand National, United Future New Zealand, and the ACT New Zealand Party favour an intensity-based scheme without a cap. The New Zealand Labour Party, the Māori Party, and the Green Party oppose this option

### **Sectoral coverage**

The current ETS takes an “all sectors and gases approach”. This refers to the inclusion in the scheme of the forestry, stationary energy, industrial processes (including those using synthetic gases), liquid fossil fuels, agriculture, and waste sectors.

#### **Waste**

Including emissions from wastewater treatment, private landfills, and cleanfills in the scheme is not preferred, as these emission sources are numerous in the waste sector, and there are difficulties with calculating actual emissions from each facility. Issues relating to estimating emissions from municipal landfills will be resolved in partnership with the sector as further regulations are developed. Emissions from these sources are not included in the current legislation.

#### **Synthetic gases**

The current ETS design will allow exporters to claim units for hydrofluorocarbons, perfluorocarbons, and sulphur hexafluorides that are contained in exported equipment or destroyed, while imported equipment containing HFCs, PFCs, and SF<sub>6</sub>s will be subject to emissions obligations. The current scheme does not include surrender obligations for these gases until 1 January 2013, allowing time for any concerns around this issue to be incorporated into a workable model.

#### **Agriculture sector**

Agriculture accounts for approximately 48 percent of New Zealand’s emissions. It is therefore desirable to include this sector in any broad-based pricing scheme. However, including the agriculture sector in the ETS presents significant challenges. The biological nature of agriculture systems makes it difficult to estimate emissions at the national level or the farm level. Problems also arise with the large number of emitters in the agriculture sector and the difficulty with verifying information that might be used to measure on-farm emissions. Further research and development will help to minimise these uncertainties, but they are likely to remain significant in the near future.

A major problem with including agriculture is the potential for adverse effects on competitiveness, leading to arguments for significant free allocation to this sector. However, a balance needs to be achieved between the competing objectives of protecting competitiveness and ensuring emitters pay the price of emissions.

Including agriculture in the ETS would allow farmers to begin to factor the cost of emissions into production and investment decisions for the long term. Furthermore,

including the agriculture sector would ensure that long-term investment decisions in the sector were consistent with a future low-carbon economy.

Including agriculture in the scheme requires some discussion of whether the point of obligation for agriculture should be set at the farm level or at the processor. There is a trade-off attached to the decision. A farm point of obligation would be expensive to implement and operate, but would provide a price signal directly to emitters, which might help drive behaviour change once there were recognised measures that farmers can take to reduce emissions. On the other hand, a processor point of obligation is less expensive, but also less effective as it attaches the cost of emissions to farm output.

The Agriculture Technical Advisory Group established by the Ministry of Agriculture and Forestry concluded that the point of obligation was best placed at farm level, acknowledging that limited understanding or acceptance of the ETS by farmers could increase the risk of non-compliance.

According to the Parliamentary Commissioner for the Environment, improving environmental performance in the agriculture sector is best done farm- by- farm, and recommends the establishment of a farm advisory programme to help farmers to reduce greenhouse gas emissions, to deal with the administration requirements of the ETS, and possibly to provide assistance on other matters.

Most agriculture submitters supported an intensity-based scheme, with the point of obligation being the farm when possible. On balance, we consider that the long-term goal should be for the point of obligation to be placed at farm level. However, issues related to the number of participants and the ability to verify farm level information means that a farm-level point of obligation is not practical to implement initially. Once these issues can be satisfactorily resolved, and subject to stakeholder support, then the obligation should be moved to farm level.

## Recommendation

13 We recommend to the Government that the agriculture sector be included in the NZ ETS with the long-term goal being that the point of obligation is placed at farm level, once issues relating to the number of participants and the ability to verify farm-level information are resolved. *The New Zealand Labour Party and the Green Party strongly support the entry of the agriculture sector no later than January 2013. The ACT New Zealand Party is opposed to the agriculture sector being included in the ETS.*

## Sectoral entry dates

The economic and equity reasons for broad coverage by a scheme support the inclusion of all sectors and gases at the same time, and sooner rather than later. The timing of the implementation of an ETS will affect the overall costs of reducing emissions in the long-term. The Australian Treasury has analysed the relative merits of early implementation and delayed implementation of a scheme. It concluded that if all countries delay action, the short-term benefits are soon outweighed by additional long-term costs. If global emissions pricing occurs gradually, it suggests the costs will be lower for individual countries that take early action and higher for economies that delay.

**Waste**

Submissions from the waste sector sought either a delay to the entry of landfill emissions into the ETS or their complete exemption. They argued that a cost-benefit analysis would show no basis for including the sector in the scheme.

The effects of existing regulations and the difficulty of measuring emissions are reasons for the delayed entry of landfill emissions (they enter in 2013). The national landfill gas air quality standard has been estimated to be especially important in reducing methane emissions to date, but its coverage is limited to only the largest landfills. Most gas emissions from landfills in New Zealand are unregulated. A price on landfill emissions through an ETS would encourage landfill operators to implement measures to manage gas emissions or improve existing facilities. There would also be an incentive to encourage the development of emissions-efficient solid waste management techniques such as biodigesters.

An important equity argument for retaining the current coverage of the waste sector is that, despite the emissions trends or existing regulations, all other sources of emissions are being brought into the scheme in time.

We are not in favour of including emissions from wastewater treatment, private landfills, and cleanfills in the scheme, because these emission sources are very numerous and minimal. Calculating actual emissions from each facility would be too inaccurate. The emissions from waste incineration for electricity generation are included in the stationary energy sector because this is a prominent form of solid waste disposal overseas and may be implemented in New Zealand in the near future.

A number of outstanding issues relating to waste-sector obligations are expected to be addressed as methodological regulations are developed. They will mainly relate to the estimation of landfill emissions, and whether or not to count “legacy” emissions from waste disposed before landfill operators have ETS obligations. Flexibility to include site-specific emission factors and assumptions will also be considered.

**Synthetic gases**

The two submissions on the inclusion of synthetic gases raised concerns about competitiveness impacts. The current NZ ETS addresses competitiveness concerns by providing for exporters to claim units for HFCs contained in exported equipment, which will be subject to emissions obligations. These provisions should largely eliminate the emissions cost of the scheme for exporters of equipment containing HFCs, and allow manufacturers to pass on the additional cost of HFCs in domestic markets (as products manufactured by international competitors will incur the same price). The scheme also allows those who collect and destroy HFCs to claim units, which, along with the emissions price, provides incentives for reducing emissions.

The NZ ETS will increase the price of electricity and should therefore provide an incentive for any energy-efficiency improvements from products containing HFCs. Where market failure prevents the full benefits of efficiency improvements being realised, additional domestic mitigation measures, such as monitoring and licensing of refrigerant handling, could be developed.

Submitters were also concerned that the ETS could incentivise ozone-depleting hydrofluorocarbons. Regulations under the Ozone Layer Protection Act 1996 provide that HFCs may not be imported in bulk from 2015. As HFCs are scheduled to commence obligations under the NZ ETS in 2013, there will be incentives for users to revert to HFCs or delay phase out of HFCs for a limited time. Imports of equipment containing HFCs will still be allowed, however, and the NZETS will potentially create an incentive to continue importing this equipment. We are informed that the Government expects to release a discussion document before the end of 2009 examining the case for regulating or banning imports of equipment containing HFCs.

It was submitted that blanket coverage of HFCs will not improve the economy or the environment. The concern is that putting a price on HFCs might result in manufacturers choosing refrigerant gases that are less energy-efficient. Refrigerants are sealed in refrigeration units for the life of the unit; there is no operational requirement to release the gas, and it is emitted to the environment only if there is an unusual failure. Blanket coverage would result in the use of synthetic gases as an alternative to refrigerants like CO<sub>2</sub>, and more energy would be consumed for the same result, causing more carbon to be emitted. The remedy suggested was to make gas recovery mandatory and remove refrigerants from the ETS.

It was also submitted that the administration and carbon costs of an ETS would make it more difficult to compete globally for little or no real environmental benefit. Heat pumps have reduced New Zealand's carbon footprint by replacing coal-fired boilers and other less energy-efficient heaters. The ETS, unmodified, will make manufacturing heat pumps uneconomic and uncompetitive, and force the relocation of the industry overseas.

Concerns about upfront increases in the cost of HFCs also warrant consideration. While domestic firms using or selling HFCs will be able to pass on costs, they may face insurance, time, value of money, and financial liquidity costs. There are also many small equipment importers in some sectors (such as importers of cars with HFC-based air-conditioning units) and their inclusion in an ETS may not be viable. There is a need to assess the composition and number of importers in various sub-sectors and determine whether it is possible to impose a size threshold or other measure that will ensure the scheme is administratively feasible while continuing to address competitiveness risks.

We note that the proposed Australian CPRS is scheduled to commence operation, with HFCs included in 2011, and that it would be desirable to consider the Australian HFC provisions and their suitability for application in the NZ ETS.

The NZ ETS does not include HFCs with surrender obligations until 1 January 2013, allowing time to work with the sector on the issues above to ensure a workable scheme can be developed. Mandatory reporting obligations for the sector are due to commence in 2012.

The overall level of emissions from the New Zealand synthetic gas sector is low. There is a case for alternative policy measures on an interim or long-term basis for the synthetic gas sector if the criteria for introduction of a carbon price are not met. They might include direct regulation, complementary measures, contributions to research and development, and voluntary agreements. Where there are competitiveness issues or stranded assets, we

are in favour of assistance measures, rather than the exclusion of a sector or of gases as a whole, or delayed inclusion. Assistance measures would compensate specific affected firms more accurately for the effects of the scheme, and can be designed to retain some of the incentives outlined above, while preventing interference with the benefits of a broader ETS.

As a means of reducing compliance costs, the introduction of quantitative “materiality thresholds” for sectors such as synthetic gases could be considered as a means to reduce growth costs, while still protecting against unrestricted growth in emissions. For example, the proposed Australian CPRS would have covered synthetic greenhouse gas emissions from the commencement of the scheme, but with obligations applied to entities that import or manufacture 25,000 tonnes of CO<sub>2</sub> a year or more (there are currently none).

### **Recommendation**

14 We recommend to the Government that officials continue to work with the synthetic gases industry to develop a workable model to address concerns around the surrender obligations for synthetic gases, HFCs, PFCs, and SF<sub>6</sub>s before January 2013.

### **Concluding remarks**

New Zealand’s emissions profile is spread over various sectors and greenhouse gases. Taking account of a market and projected long-term international circumstances, we consider that a broad ETS covering all sectors and all gases would lower the overall costs of abatement, deliver greater economic transformation, and be more consistent with equity.

NZIER and Infometrics (2009) found that in the short term, a narrow-based carbon pricing scheme at a low domestic price would impose a slightly lower economy-wide cost than a broad-based ETS. However, for long-term considerations, “if the rest of the world takes action, and technological improvements take place, a broad-based full price signal with no free allocation or exemptions is the least-cost way of meeting our post-2012 obligations”.

Submissions that sought reduced coverage or delayed inclusion of certain sectors in the NZ ETS were based on probable short- to medium-term market and international circumstances. Their concerns are more appropriately addressed through assistance measures for affected firms. Sector-wide materiality thresholds may also be a means of reducing compliance costs, while protecting against unrestricted emissions growth.

### **Recommendation**

15 We recommend to the Government that emission trading scheme rules be confirmed as soon as possible so that those who have significant interests in the primary sector, may make practical and robust investment decisions quickly.

## 8 Forestry sector

### Introduction

Under the current legislation, the forestry sector is the only sector to have already entered the NZ ETS. In this chapter, we consider issues specific to that sector, particularly application of the rules under the Kyoto Protocol to forests that were planted before 1990, and their implications for retaining flexible land use, the question of “offsets”, and the impact on biodiversity of incentives for exotic forest planning.

Similarly to chapter 7, chapter 8 is broadly concerned with the impact on the New Zealand economy and New Zealand households of any climate-change policies, having regard to the weak state of the economy, the need to safeguard New Zealand’s international competitiveness, the position of trade-exposed industries, and the actions of competing countries, the relative merits of an emissions trading scheme or a tax on carbon or energy as a New Zealand response to climate change, and the need for additional regulatory interventions to combat climate change if a price mechanism (an emissions trading scheme or a tax) is introduced.

### Land use flexibility for pre-1990 forest land and offsetting

The Kyoto Protocol and current international rules do not provide for offset planting, where an area of pre-1990 forest is removed and replaced with a new area of forest elsewhere. Under offsetting, the Crown would pay the deforestation liabilities, if landowners established an equivalent offset forest. The Crown would keep the units earned from sequestered carbon from the offset forest as it grows. New Zealand is currently advocating offsetting provisions in international rules post-2012.

Under the Climate Change Response Act, offsetting is not allowed, although it would minimise the cost (economic and fiscal) to New Zealand of complying with the Kyoto Protocol. If offsetting is eventually made available internationally, the Government must introduce it domestically, and the Act be amended to provide for this.

### Forestry allocation

The Climate Change Response Act recognises the impact of the deforestation requirements of the ETS on pre-1990 forest land values and provides for an allocation of New Zealand Units free of charge to owners of pre-1990 forest land (with the exception of land that has already been declared exempt). The allocation is capped at 55 million NZUs, less the number of units required to meet the cost of deforestation under the various exemptions. Twenty-one million NZUs of the allocation can be used during the first commitment period (2008 to 2012). These units can be surrendered immediately to cover emissions over this period, while the remaining units can be surrendered only during the period from 2013 to 2021. NZU allocation per hectare will vary, and depends on meeting certain land and landowner eligibility rules.

Some submitters told us that the forestry allocation does not fully cover the loss of land values and land-use flexibility, and requested that the impact of the ETS on owners of pre-1990 forest land be lessened by offsetting.

### **Benefits of offsetting**

Offsetting finds favour with landowners, and Māori, and may do so with New Zealanders broadly because it provides landowners with flexibility by lowering the cost of deforestation. An offsetting scheme would affect land values less than an ETS and distribute costs more widely across society, which may be regarded as more equitable. Afforestation costs under an offsetting scheme would amount to around \$2,000 to \$3,000 per hectare (excluding land purchase costs), compared with paying approximately \$20,000 (assuming a carbon price of approximately NZ\$26 per tonne) per hectare for deforestation liabilities under the current ETS. Offsetting is likely to lead to more effective land use in the long term because forests would be moved from land that has potential for more profitable agricultural uses, to land without such potential. However, only a relatively small number of forest landowners may be in a position to realise the benefit of offsetting in the first commitment period.

### **Costs of offsetting**

Offsetting would shift the cost burden from the landowner to the Crown. The fiscal costs to the Crown stem from the cost of emissions from deforestation minus the sequestration by the offsetting forest. As the cost of the deforestation liabilities would no longer be paid by the landowner, higher rates of deforestation would probably result.

There will also be economic costs to New Zealand as a whole because the value of the increased economic activity generated from agriculture (which would replace the forest) is less than the value of the assets (emissions units) that need to be removed from the economy to cover the liabilities caused by deforestation.

If offsetting were provided for internationally in commitment period two, an offsetting regime in New Zealand has been estimated to cost approximately \$480 million during the first commitment period, assuming 5,000 hectares of deforestation per year. The Crown would pay for deforestation emissions from mature forests, and receive a small number of carbon credits from the young offset trees as they grew. Before its entry date, the Crown would pay for any agricultural emissions resulting from land conversion.

In commitment period one, assuming the current 21-million-unit forestry allocation and no offsetting, the fiscal cost would be approximately \$525 million. If the entire forestry allocation were removed, the fiscal costs of allowing offsetting compared with the current ETS approach would be similar for at least the first commitment period.

Introducing a domestic forestry-offsetting scheme for the first commitment period would assume that New Zealand could address the deforestation issue without the need for a change in international rules, which could prove to be more costly for New Zealand then and subsequently. If offsetting were provided for under the international rules post-2012, then the net benefits of allowing offsetting now from the additional economic activity on farmland would be greatly reduced, since it is essentially only the benefit of converting to

farmland two or three years earlier than would otherwise be possible under the new international rules.

### **Recommendation**

16 We recommend to the Government that the issue of offsetting be pursued by those currently negotiating its international recognition, but no changes to domestic policy be made unless such an agreement is reached.

### **Other environmental considerations**

We were advised by the Parliamentary Commissioner for the Environment that forestry conversion activities in New Zealand, which would increase if forestry offsetting were provided for, would generally exacerbate water quality issues and potentially other environmental issues, such as erosion. In addition, there are increased risks to biodiversity, described below.

#### **Impact of forestry plantings on biodiversity**

We are concerned about the effects of the current arrangements for forestry on important biodiversity in New Zealand. Indigenous vegetation, especially those forms that do not grow to five metres in height, may be cleared in favour of planting an exotic forest. Such clearance is likely to be increased if there is a forestry offset scheme. There are regulatory controls that prevent the clearance of some indigenous vegetation, particularly the Forests Act 1949 and the Conservation Act 1986. Other limiting factors include the availability of scrubland for sale or lease for planting, and the costs of clearing and preparing land for forest planting.

However, the Parliamentary Commissioner for the Environment notes that the area of New Zealand covered by indigenous ecosystems appears to have decreased since the Resource Management Act 1991 was passed. District plans do not generally prohibit clearance of indigenous vegetation, nor do they require the natural spread of wilding trees to be controlled.

We note that the Cawthron Institute conducted an environmental assessment of the NZ ETS and closely related measures. One of the adverse impacts reported was the potential loss of some indigenous ecosystem types with high biodiversity values, such as regenerating forest, scrubland, and tussock grasslands, which may be cleared and afforested with exotic species to gain forestry sink credits. We agree that it is important to ensure that the forestry happens on those marginal grasslands, which are erosion-prone, rather than on ecologically significant tussock lands and regenerating bush.

In this context, we note the Parliamentary Commissioner's recommendation that the ideal long-term balance between exotic production forests and natural indigenous forests must be considered, and not only in terms of carbon storage potential. If vast exotic plantations are not wanted, New Zealand must act now.

The ETS strengthens existing incentives for exotic plantations, at the expense of indigenous forests. A particular problem relates to the current carbon look-up tables, contained in the Climate Change (Forestry Sector) Regulations 2008, which indicates how many credits a particular forest can earn. Indigenous forest carbon sequestration is

rewarded at a simple flat rate of three tonnes of CO<sub>2</sub> per hectare per year. According to the Parliamentary Commissioner, this estimate is low. Landcare has shown sequestration rates two or three times as great as than this for regenerating manuka and kanuka.

This will be an especially important issue for Māori on the East Coast who have large areas of kanuka and manuka growing on their lands. Any policy decisions in respect of these lands must recognise and appropriately balance the economic, environmental, and social objectives of these landowners.

The Parliamentary Commissioner told us that indigenous forests will never sequester carbon as fast as exotic conifers or eucalypts. However, the low sequestration rates in the existing look-up tables for carbon stock per hectare for post-1989 indigenous forest may further discourage landowners from planting, or allowing reversion to, indigenous forests. The Ministry for Agriculture and Forestry have deferred work on revised look-up tables until this review is complete. In the interim, owners of indigenous forests are being disadvantaged. The Parliamentary Commissioner endorsed amending the indigenous carbon look-up tables as soon as possible, to make them more consistent with the best available scientific information. She also recommends that it be established soon when the amended carbon look-up tables will be available.

## Recommendations

17 We recommend to the Government that further research be conducted on the role of forestry sequestration in mitigating emissions, including an investigation of the carbon sequestration rates of indigenous species and management techniques for their enhancement.

18 We recommend to the Government that the carbon look-up tables for indigenous forests be amended to reflect the best scientific information on sequestration as soon as possible.

## Wilding pines

The Parliamentary Commissioner also highlighted the fact that wilding pines are an increasing problem in the South Island high country and parts of the North Island. Conifer seeds can travel up to 30 kilometres. If uncontrolled, wilding pines can colonise grassland and scrubland, preventing grazing and radically changing the ecology and landscape. Post-1989 tree weed forests are eligible to earn carbon credits (as post-1989 forest land) under the current ETS. This creates a disincentive to control wilding pines.

Section 184(9)(b) of the Climate Change Response Act 2002 provides for an exemption to allow deforestation of pre-1990 tree-weed forests that have naturally regenerated. This does not include pre-1990 plantations of wilding pines, such as those at Mid Dome in Southland or at Craigieburn in Canterbury. The ETS will increase the costs of eradicating these seed sources.

The Parliamentary Commissioner recommends that it be clarified in which circumstances, if any, wilding pines might be appropriate for carbon sequestration.

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**Recommendation**

19 We recommend to the Government that a clear decision be made about in what circumstances, if any, wilding pines may be used for carbon sequestration, given the negative economic and environmental impact of tree weeds in some areas of New Zealand.

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**Concluding remarks**

Offsetting would allow more flexibility in land use by shifting the cost of deforestation from landowners to the Crown. Offsetting would be attractive to landowners, especially those with developed plans to convert forests to agricultural land.

The Government might enjoy fiscal savings if the allocation to pre-1990 forest landowners were greatly reduced or removed, although many submitters were in favour of allowing an offsetting plan in conjunction with an allocation of NZUs. Any fiscal savings would come at a significant economic cost. However, the cost of additional emissions liabilities (carried by the Crown) would be greater than the extra economic activity generated from the new agricultural land.

New Zealand is currently negotiating international recognition for offsetting. We recommend that the offsetting issue be largely left in the hands of negotiators at this point, but strongly support this matter being pursued.

## 9 Māori interests

### Introduction

In chapter 9 we address the impacts of an emissions trading scheme on iwi as the collective asset holder, and Māori population interests. We first consider the relevant principles affecting Māori interests in emissions trading before discussing specific issues of relevance for Māori, such as the forestry component of Treaty settlements and the economic development of iwi and Māori organisations.

Like chapters 7 and 8, this chapter is broadly concerned with the impact on the New Zealand economy and New Zealand households of any climate change policies, taking into account

- the weak state of the economy
- the need to safeguard New Zealand’s international competitiveness
- the position of trade-exposed industries
- the actions of competing countries
- the relative merits of an emissions trading scheme or a tax on carbon or energy as a New Zealand response to climate change.

This chapter also addresses the case for increasing the resources devoted to a New Zealand-specific climate change response.

### Principles affecting Māori interests in emissions trading

Submitters told us that the concentration of iwi interests in the primary sectors (forestry, agriculture, fisheries, and increasingly geothermal energy) together with the over-representation of the Māori population in the lower socio-economic bracket mean that Māori are likely to be significantly affected by an emissions trading scheme, and will struggle to meet the associated costs.

Māori are not homogeneous—their preferences regarding an emissions trading scheme differ depending on regional geography and natural resources. But there are several basic overriding principles that should influence consideration of Māori interests in emissions trading:

- Fairness and equity: an emissions trading scheme must not disproportionately affect Māori, either as iwi collective asset holders or as individuals and households.
- Treaty of Waitangi: the property rights of iwi and citizenship interests of individual Māori must be protected.
- Tangata whenua: iwi are enduring shareholders in their land-based and natural resource assets in New Zealand, and will take a long-term multi-generational view.

- Social and environmental concerns: the economic effects and benefits must be balanced against social and environmental effects and benefits.

### **Exclusive issues for Māori**

We consider that the effects of an emissions trading scheme will affect Māori in largely the same way as other New Zealanders, except in four significant respects:

- the forestry component of Treaty settlements and their value
- the location of iwi and Māori organisations on the development continuum
- the disproportionate number of Māori individuals and households at the lower end of the socio-economic spectrum
- the potential alienation of land as set out in the terms of Te Ture Whenua Maori Land Act.

We heard from submitters (Ngati Porou Forests) that an emissions trading scheme and specifically the creation of permanent forests may give rise to this risk.

### **Forestry component of Treaty settlements**

We have been advised that approximately 36 percent of all pre-1990 exotic forest land is estimated to be currently owned by Māori (including the exotic forest land transferred under the recent Central North Island settlement). This could increase to over 60 percent as Treaty claims on the remaining land under Crown Forestry Licences are settled and the land transferred to iwi. The treatment of pre-1990 forest land is therefore critical to Māori.

The Ministry of Agriculture and Forestry estimate that 38 percent of pre-1990 forest land owned by Māori has sufficient carrying capacity to be converted to a higher use such as agriculture. MAF also note, however, that the actual proportion that may be converted could be much lower, and will depend on factors such as location, access to water, and conversion and infrastructure costs. The adoption of a capped price along the lines of the proposed Australian CPRS system will be a major issue for iwi with post-1989 forests and indeed for all forest owners. Iwi are large owners of such forests and may be disproportionately affected. Further, such a capped price is likely to discourage investment in the planting of new forests by iwi and other foresters alike.

The development of the NZ ETS coincided with a number of Treaty settlement negotiations between the Crown and iwi. A number of these negotiations included discussions on the transfer of forestry land from Crown to iwi. It is important that the Treaty of Waitangi provisions and obligations of the Crown towards Māori are not compromised by the introduction of an emissions trading scheme. This is especially important for those iwi who have Treaty settlements involving forests. Many Māori submitters said that for them, the Treaty takes precedence over the Kyoto Protocol, or any other international agreement.

Provision for flexible land use is a critical issue. Flexibility in land-use change (especially for marginal land) for Māori is necessary to provide for shifts in technology and markets, and the targeting of offsets should be guided by the principle of “best land use”. Negotiating efforts to achieve offsetting internationally are therefore paramount.

In determining the impact of the NZ ETS on iwi land settlements it is important to consider the timing and the nature of any settlement in developing ETS policy. There are three broad categories of land in this regard, which are differently affected by the NZ ETS:

- land that was settled through or after the NZ ETS development process in which the land was valued for settlement purposes assuming the ETS was in place
- land that was settled without an assessment of the effects of the ETS, and valued assuming a highest and best use of forestry
- land that was settled without an assessment of the effects of the ETS where the land was valued assuming a highest and best use other than forestry (such as dairying), or was otherwise acquired by iwi prior to the introduction of the ETS.

We have been advised that the bulk of the land that iwi own falls into one of the first two categories.

Land forming part of a settlement that occurred after the ETS was public would have been valued in the context of the ETS. In such circumstances, the imposition of the ETS does not come at an additional cost to the landowners. It may actually benefit the recipients of settlement land as they may receive more Crown rental because they will receive more land than they otherwise would have. The Central North Island settlement is in this situation.

For land that was valued at forestry value (highest and best use being forestry) prior to the ETS, the imposition of the ETS should not greatly affect land values relative to the settlement value. However, the imposition of the ETS would reduce the alternative economic opportunities available on the land if deforestation were desired (for example, a possible conversion to dairying would become less financially attractive on the land). Ngai Tahu is in this situation.

For land that was valued assuming a best and highest use other than forestry, or was otherwise acquired by iwi prior to the introduction of the ETS, the introduction of the ETS does come at a cost, in relation to the settlement value of the land, and also (depending on the land's best use) on the land value.

The suite of policy programmes such as the Permanent Forests Sink Initiative, the Afforestation Grant Scheme and, the East Coast Forestry Project are important for providing development options previously unavailable to landowners. However, these programmes alone will not necessarily incentivise afforestation investment by iwi (and others). Further policy to incentivise the creation of new forests to help reach the country's emissions reduction target is warranted. A significant proportion of the forest could be on land which (at least given current technology and costs) would have little potential for timber production, but much potential in such areas as water and soil conservation, biodiversity, and biofuels for renewable energy.

There should be much less emphasis on Radiata pine and much more on alternative species and indigenous forests important to iwi. Because of the need for the forest to meet emissions targets, appropriate policy incentives are warranted for the creation of such forests, rather than relying on the ups and downs of speculative and investment planting based on log and carbon prices and the vagaries of international climate change negotiations.

Iwi have also noted that there is currently little recognition of the important role pre-1990 indigenous forests play in global climate change as carbon sinks, water sinks, and reservoirs of valuable biodiversity. Indigenous forests are important sources of natural medicines and foods to many Māori, and of naturally durable building materials for marae.

The current ETS provides an incentive for planting new exotic forests. Some iwi have expressed a strong preference for indigenous forests, but because they sequester carbon more slowly than exotics, there is less incentive to plant them. There needs to be recognition that, although carbon is sequestered at a slower rate, indigenous forests, unlike exotic forests, are not normally grown for harvesting, so in the long run indigenous forests compare favourably with exotic forests. There is an argument that companion measures should be developed to recognise the important role that indigenous forests can play.

### **Recommendation**

20 We recommend to the Government that the obligations of the Crown to Māori, including those under the Treaty of Waitangi, not be compromised by the New Zealand Emissions Trading Scheme.

### **Iwi and Māori organisations on the development continuum**

Iwi and Māori organisations have only relatively recently had restored to them the opportunity to drive their own development, through the Treaty settlement process, and more positive engagement by central and latterly local governments. Not all such organisations have completed the Treaty settlement process. The arrested development and lost opportunities resulting from misdirected Government policies of the past have had the effect of placing iwi and Māori development in a position analogous to that of undeveloped countries. Their aspirations are no less than those of wider New Zealand, but the delayed start to realising them means that they are located further down the development continuum than they otherwise might have been, with more exposure to the impacts of an emissions trading scheme. The disproportionately low social and economic status of Māori can mean that Māori individuals and households are more vulnerable.

Accordingly, the high and growing Māori participation in key sectors such as forestry, farming and fishing, and the disproportionately low socio-economic status of Māori, require their continued engagement in the policy and regulatory process. This is intended to help ensure that Māori do not bear a disproportionate burden from an emissions trading scheme, whether in the Treaty settlement area, or in other effects on Māori as a population.

Māori must have the continued opportunity to engage directly with the Government at the ministerial level during initial policy design, and in the implementation of an emissions trading scheme. An appropriately resourced governance arrangement with Māori would ensure that essential regulation and implementation plans were designed to ensure Māori did not bear a disproportionate burden.

The emissions trading scheme and associated policies remain a highly complex issue as much for Māori as for others. However, Māori lack the resources, accurate data, and information to make robust and timely responses. A targeted communication and engagement strategy will be needed to enable Māori to participate fully in the emissions trading scheme and avoid undue exposure to risk. A better-targeted structure for Māori

research and the development of emissions reduction technologies and new climate change-related technologies are also needed.

The international environment remains fluid regarding the adoption of cap-and-trade systems. New Zealand and Māori will be exposed, because of their relative size, to the effects of international decisions. Flexibility to respond to international developments will be needed, hence the importance of continued Māori involvement in the proposed governance mechanism. It is also essential that emissions trading scheme rules are confirmed as soon as possible so that iwi, who have significant interests in the primary sector may make practical and robust investment decisions quickly.

### **Recommendations**

- 21 We recommend to the Government that action be taken to implement a communication and engagement strategy to achieve maximum involvement of New Zealanders in climate change policy.
  - 22 We recommend to the Government that action be taken to implement a targeted communication and engagement strategy to achieve maximum involvement of Māori in climate change policy, including the Emissions Trading Scheme and to ensure that they are not unduly exposed to risk.
  - 23 We recommend to the Government a better-targeted structure for Māori research and development of emissions reduction technologies and new climate change-related technologies.
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### **Disproportionate numbers of Māori individuals and households at the lower end of the socio-economic spectrum**

Lower-income Māori households, especially in rural communities, will probably be more affected by higher electricity prices than non-Māori households. Māori can be expected to contribute a relatively low proportion of total greenhouse gas emissions, and to spend a greater proportion of their income on electricity and liquid fuels. There is a case for targeting support to offset emissions-trading-scheme-related electricity-price rises.

Māori communities will be particularly vulnerable to the impacts of climate change. In general, lower socio-economic groups are worst placed to meet the costs of an emissions trading scheme, which could have adverse health and economic effects. It is important that a full array of assistance measures be adequately considered and targeted at the more vulnerable communities and members of the economy (whether Māori or not).

We expect that Māori would support the recommendation by the Parliamentary Commissioner that a Computable General Equilibrium model of the New Zealand economy be developed, and that it be dynamic, able to deal adequately with land use, and held in the public domain.

### **Concluding remarks**

There is no agreement on the appropriate weightings of environmental, social, and economic factors. We consider that, as a general principle, Māori should not be asked to bear a greater burden nor experience a greater disadvantage than any other part of the New

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Zealand community. Moreover, arising out of historic Crown actions that impeded iwi development, we consider that there is a responsibility to ensure iwi participation in the design and implementation of the emissions trading scheme, and mitigation of impacts from the scheme.

### **Recommendation**

24 We recommend to the Government that, as a general principle, Māori not be asked to bear a greater burden or be more disadvantaged than other sectors of the New Zealand community.

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## 10 Complementary measures

### Introduction

In our final chapter we turn our minds to other measures that are relevant to New Zealand's response to climate change to complement the NZ ETS. In this chapter we consider the need for adaptation and mitigation policies and measures, research and development, monitoring, and arguments for additional measures over and above price measures.

This chapter addresses the broad terms of reference that required us to examine the relative merits of a mitigation or adaptation approach to climate change for New Zealand, to consider the case for increasing resources devoted to New Zealand-specific climate change research, and to consider the need for any additional regulatory interventions to combat climate change if a price mechanism (an ETS or a tax) is introduced.

### Adaptation and mitigation policies

The *IPCC Fourth Assessment Report* acknowledged that human-induced climate change is already happening, and climate change is inevitable because of historical and continuing emissions. It concluded that neither adaptation nor mitigation alone can avoid all the effects of climate change; however, they can complement each other and together significantly reduce the risks associated with climate change.

An effective response to climate change should include policies and measures for both mitigation and adaptation. This was the view of the majority of submitters who spoke to this term of reference. Mitigation and adaptation policies are not mutually exclusive, and if they can be integrated this should help ensure an effective long-term policy response.

### Case for mitigation in New Zealand

Mitigating climate change will require a collective global effort. New Zealand's emissions account for only 0.2 percent of global emissions, so New Zealand depends on mitigation activities by other countries, especially the major emitters. This has been cited as a reason for New Zealand to take no action or incur no costs to mitigate climate change. It is likely to be in New Zealand's national interest, however, to assume a fair share of global emission reduction efforts. There will be risks to international relationships and trade if New Zealand is not involved in a global agreement or is perceived to be less environmentally conscious than its counterparts.

Climate-change mitigation will also have valuable environmental and economic co-benefits, including conservation of natural resources, better air and water quality, more sustainable land use, more efficient production, technological innovation, and the development of new markets. Mitigation of climate change is also consistent with the *kaitiakitanga* ethic of stewardship.

**Domestic mitigation measures**

The critical objective of New Zealand's greenhouse gas emission mitigation response should be to prepare the economy for continued existence in an increasingly carbon-constrained world at least cost (economically, environmentally and socially) and to reduce New Zealand's emissions while minimising undue ill-effects on people, the environment, and the economy.

New Zealand's emissions path until 2045 differs from those of other developed countries, because of our current sources of emissions and removals, and our projected growth in emissions. Our underlying emissions path is projected to rise steadily at approximately 1 percent per year, alongside a similar forest sink trend. Currently, New Zealand's forests help to offset a significant percentage of our emissions, but as our post-1989 forests reach harvest from the mid-2020s, our overall emissions (including forest sinks) will spike in the absence of significantly increased rates of new planting, and then fluctuate cyclically. Fluctuations will be affected by the prices of carbon and logs, the costs of harvesting and associated infrastructure, and any changes to the ETS that affect harvest or replanting decisions.

The international climate-change environment currently lacks certainty as to policy direction. But even in the absence of specific direction as to the future international framework, we can assume our major trading partners have an ongoing commitment to addressing the climate-change challenge. Domestic mitigation measures in New Zealand will need to reflect the uncertainty generated by the international framework, but should provide policy stability at a high level.

**Complementary or specific non-price-based measures**

Dr Adrian Macey has said, "A country with complementary measures will be in a stronger negotiating position in Copenhagen because they give credibility to its target". Australia, the United States, and the United Kingdom are all working on introducing complementary measures.

The Parliamentary Commissioner for the Environment told us that an ETS is just one of the tools needed to reduce greenhouse gas emissions. An ETS will not work by itself, and complementary measures—also called non-price-based measures—are essential and should be considered now. There are many kinds of complementary measures.

The appropriate choice of non-price-based measures will be very dependent on the detailed design of any price measure, making it difficult to comment on the suitability of specific complementary measures before a price measure is decided upon. Accordingly, this chapter does not analyse specific proposals for non-price-based measures, but considers the rationale and general arguments for using them.

Generally, where other countries or jurisdictions have developed or are developing a price measure, it operates in the context of a package of measures to reduce emissions. For example, the proposed Australian ETS was to operate alongside complementary measures including an expanded renewable energy target, investment in research, development, and demonstration of low-emissions technologies, and actions to promote energy efficiency.

*The Stern Review* also emphasised the importance of combining an emissions price with other measures for mitigation, finding that establishing a carbon price, either explicitly through a tax or trading, or implicitly through regulation, is an essential foundation for climate-change policy. The second essential element is technology policy, covering the full spectrum from research and development to demonstration and deployment; and the third is the removal of barriers to behavioural change.

The ETS is an important means of addressing our international commitments to reduce greenhouse gas emissions. However, it will be necessary to supplement the ETS with policies to improve its effectiveness. In addition, where other policies may undermine the ETS should be identified. The Parliamentary Commissioner for the Environment recommends a study be carried out to systematically identify and assess existing and potential complementary measures. The result might be comparable to the *Wilkins Report* prepared for the Australian Government last year, but on a New Zealand scale.

### **Mitigation policy options**

Various mitigation options can help reduce emissions and increase removals via sinks. Appropriate responses will vary depending on which sector is responsible for implementation and who is better informed and thus in a better position to make decisions—the Government, producers, or consumers.

The Government can use a number of possible policy approaches to mitigate New Zealand's contribution to greenhouse gas emissions, and they will not necessarily be mutually exclusive.

**Direct regulation** Traditional command and control regulations, such as setting emissions standards for industry processes and practices, work by outlawing some activities and encouraging others. Direct regulation provides the benefits of certainty, and effective targeting of sources of emissions that have other unwanted economic, environmental, and social effects. On the other hand, direct regulation can be insufficiently responsive to emerging emissions reduction technologies. This can also reduce efficiency and equity. Direct regulation is generally considered to be more costly than market-based mechanisms, and regulations that operate alongside an ETS could increase the cost of abatement unless they were targeted at market barriers. This is because additional regulations require monitoring and enforcing and will remove some of the flexibility of firms to choose the most cost-effective way to manage emissions.

**Performance standards** Performance standards set a required outcome, such as energy used to accomplish a task, but leave flexibility as to how to that is to be achieved. They are thus responsive to new technology and innovation. They are used cost-effectively in the Building Code and standards for appliances and vehicles, and are effective in reducing emissions.

**Information and promotion** Although a price on emissions will provide an incentive for emissions reductions, a lack of information about abatement opportunities may prevent businesses and consumers from making optimal decisions. Well designed information programmes could improve the effectiveness of an ETS. An example of a well designed information programme is the energy efficiency labelling and promotional activities undertaken by the Energy Efficiency and Conservation Authority.

**Emission reduction incentives** Financial incentives including subsidies, tax relief, or low- or zero-interest loans can encourage emissions reductions. It is difficult, however, to decide who should be eligible for assistance and how much assistance should be provided and for how long, and to monitor the quantity and cost-effectiveness of the resulting reductions in emissions. Incentives will not necessarily overcome other barriers to reducing emissions, and will not guarantee emissions reduction outcomes. Emissions reduction incentives could include options such as Joint Implementation.

**Formalised voluntary reductions** In some cases the Crown may be able to agree with an industry a set of goals or measures to reduce emissions. Under a memorandum of understanding between the Crown and users of, for example, SF<sub>6</sub>, the Crown waives a price measure regarding emissions from this industry for the short term. Increased awareness and thus voluntary reduction initiatives confer some economic benefits and some environmental improvements.

**Broad price-based measures** Price-based mechanisms apply a price on emissions throughout the economy. Mitigation decisions are left to the producer and consumer on the basis of relative cost, and they will often make more informed and cost-effective decisions than the Government could. Price-based measures can be expected to achieve emissions reductions at least cost, especially when emitters are left to decide on the approach to managing their emissions costs.

**Government-funded unit purchases** The Government could fund some or all of New Zealand's international obligations by funding reductions in emissions in other countries by purchasing emissions on the international market. Purchasing could be funded through general taxation, or through a targeted levy. This might reduce New Zealand's producers' and consumers' incentive to reduce emissions. However, they would have no direct means of reducing their emission-related costs. New Zealand would continue to reduce global emissions and meet its international obligations, but domestic emissions would be likely to rise under business-as-usual practices. As noted in the NZIER and Infometrics (2009) report, pricing schemes eventually cost less than the Government must pay, even when no action is assumed by the rest of the world, and there is no technological change. This approach would become increasingly costly for the Government, especially as international agreements became more stringent.

### Hybrid approach

There is a case for applying a hybrid policy approach, which would devolve some but not all responsibility to emitters. Hybrid approaches used internationally include sectoral hybrids, where some sectors are covered by trading and some by tax (for example, in the EU); and pricing hybrids, trading schemes where a fixed price unit issuance is used with fixed-price trading. This is effectively the approach New Zealand is taking in the short-term by the phasing in sectors into the NZ ETS. A hybrid approach was considered by NZIER and Infometrics (2009) to be beneficial in the short-term.

### Case for adaptation in New Zealand

The *IPCC Fourth Assessment Report* found that adaptation is necessary in the shorter and the longer term to address effects of warming that will occur even with emissions stabilised at the lowest level its scenarios assumed. It acknowledged that the limits and costs of climate

change are not yet fully understood, but asserted that unmitigated climate change will exceed the capacity of natural, managed, and human systems to adapt. The earlier mitigation efforts are made, the sooner we can decrease our dependence on carbon-intensive infrastructure and reduce our climate-change and associated adaptation needs.

Climate-change effects are expected to vary by country and region. In New Zealand the major impacts will include higher temperatures (especially in the North Island), rising sea levels, more frequent extreme weather events (especially droughts and floods), and changes to rainfall patterns (higher rainfall in the west and less in the east).

IPCC scenarios for New Zealand warming projections range from 0.2 to 2.0 degrees Celsius by 2040 and 0.7 to 5.1 degrees Celsius by 2090, relative to 1990 temperatures. Changes will be both positive and negative for New Zealand. Agricultural productivity will increase in some regions, while others will face drought, pests, disease, and costs associated with changes in land use. Warmer winters with fewer frosts will come at the expense of hotter summers with more risk of heat stress and subtropical diseases. Forests and other vegetation will grow faster, but invasion by exotic species will be more likely. Some regions will encounter drier conditions while others will be more prone to floods and storms. Rising sea levels will increase the risk of erosion and saltwater intrusion, and consequently the need for coastal protection. Snowlines and glaciers are expected to retreat and water flows in some major South Island rivers will be affected.

New Zealand's economic and environmental planning must therefore include climate change adaptation strategies to manage the negative effects of climate change and capitalise on its positive effects. Climate-resilient infrastructure and economic development will also reduce the future vulnerability of our communities and economy; it is important that the social and cultural implications of adaptation are well thought through.

It may be useful to review the adaptation responses that are being implemented overseas, with a view to adapting them to a New Zealand context. As with mitigation, New Zealand has undertaken international obligations to contribute to adaptation activities. All countries signatory to the UNFCCC have agreed to cooperate in preparing for adaptation to the effects of climate change; to developing and elaborating appropriate plans for coastal zone management, water resources and agriculture; and to protect and rehabilitate drought-prone areas and deserts. Developed countries have also agreed to help vulnerable developing countries meet the costs of adaptation. Adaptation measures are expected to feature in a post-2012 international agreement on climate change. For New Zealand, perhaps our biggest adaptation concern lies with our Pacific neighbours.

We acknowledge the finding in the IPCC'S 2007 *Synthesis Report* that "responding to climate change involves an iterative risk management process that includes both adaptation and mitigation and takes into account climate change damages, co-benefits, sustainability, equity and attitudes to risks".

We consider that both mitigation and adaptation policies and strategies should be included in New Zealand's response to climate change to manage the potential risks and opportunities. Allocation of resources will be an important policy decision requiring careful consideration of various factors that will be subject to change over time. In addition, focus on scientific funding will be required.

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**Recommendation**

25 We recommend to the Government that long-term infrastructure be developed in line with climate change considerations and New Zealand support Pacific nations in adapting to climate change.

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**Adaptation efforts**

Climate change is expected to change the frequency and intensity of existing natural hazards. There is a strong case for educating New Zealanders about the potential effects of climate change, and preparing people to deal with them by minimising risks and maximising opportunities. It will be important to determine an appropriate level of resources to allocate to adaptation in the short term, recognising the potential range of impacts in the long term.

The Ministry for the Environment has a Climate Change Adaptation work programme to promote responsiveness to the physical effects of climate change. The ministry partners with stakeholders such as local government, planners, engineers, insurers, surveyors, and lifeline utilities to support the delivery and promotion of adaptation initiatives. Technical manuals on climate-change impacts are being produced. Targeted guidance materials are being developed, which reflect the findings of the *IPCC Fourth Assessment Report*, for local government on preparing for the likely effects of climate change and coastal change.

The ministry is also developing a range of adaptation resources including educational resources for students and teachers, and urban resources for city residents. It is also working with the Ministry of Agriculture and Forestry to develop a web-based tool box targeted at local government and rural land managers.

The Ministry of Agriculture and Forestry's adaptation programme promotes the resilience of land-based sectors to climate change. Base conditions for growing and farming in New Zealand will change, with extreme weather events such as droughts becoming more frequent. Climate change will affect the sector's economic and environmental performance which currently accounts for 64 percent of the country's total merchandisable export revenue. The ministry is working with land-based sectors, local government, and Māori to ensure resilience to climate change.

Increasing awareness of climate change among land managers, Māori and non-Māori, of climate change is a priority. Other key priorities in the short term are understanding the impacts of climate change on production systems and developing tools for land managers to respond. Current research includes the impacts of climate changes on extreme wind, fire, drought, and groundwater systems. Work is also under way on sub-tropical boundaries and pest impacts on forests.

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**Recommendation**

26 We recommend to the Government that high priority be given to research into reliable and accurate estimation and monitoring systems for agricultural emissions, particularly at farm level.

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27 We recommend to the Government that New Zealand's economic and environmental planning activities include climate change mitigation, and adaptation strategies.

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### Research and monitoring

Submitters requested more research into climate change science in general as well as into specific areas. We agree that it is necessary to collect data and conduct research at a more local level. We heard a number of proposals for increased specific research, which highlighted the uniqueness of New Zealand's emissions profile, and the fact that no other country will do work for us that lies at the core of our national interest. We consider that competing research priorities should be examined in the context of available Government funding and opportunities.

### Current major areas of research

- **Underpinning climate science** Research is conducted in New Zealand through programmes such as the National Institute of Water and Atmospheric Research's Climate Variability and Change programme, to improve understanding of the basic processes of atmosphere, biosphere, and animal systems.
- **Adaptation** Work on adapting to long-term climate change to improve New Zealand's resilience to extreme weather events is being carried out via the Foundation for Research, Science, and Technology (FRST), MAF, and the Ministry of Transport.
- **Mitigation** A significant portion of climate change research is aimed at reducing net emissions, especially from animals and energy production.
- **Pastoral emissions** Research undertaken in New Zealand on ruminant methane includes work conducted by the Government and on industry funding partnership, the Pastoral Greenhouse Gas Research Consortium, and through MAF's Sustainable Land Management and Climate Change Plan of Action.
- **Forestry** Research, conducted through MAF and the Ministry for the Environment, seeks best-practice approaches to forestry, including coping with extreme weather events and maximising carbon uptake, dealing with uncertainty about carbon trading and price dynamics, and examining the atmospheric warming effects of planting dark trees in place of pasture.
- **Carbon sequestration** MAF is currently supporting a professorship at Massey University on biochar and funding studies on the production and use of biochar in New Zealand; and other soil-carbon-related projects are funded through various public and private sources and programmes.
- **Inventory research** The Land Use and Carbon Analysis System, which allows New Zealand to claim credits for our carbon sinks, is being implemented to meet New Zealand's reporting requirements under the Kyoto Protocol, and MAF is leading an agricultural inventory research programme to improve the national greenhouse gas inventory under the IPCC good-practice guidance manual for methane and nitrous oxide.

- **Energy** Research is being done into energy sources and biofuels, through FRST, the Marine Energy Deployment Fund, the Low Carbon Technologies Fund, and the Energy Efficiency Conservation Authority.
- **Understanding the impacts** Investigation into the effects of climate change and its implications for New Zealand is conducted through FRST's Global Processes portfolio, which gathers temperature, rainfall, and other environmental data. MAF is funding research on the impacts of climate change on wind, fire, drought, groundwater, and forest pests on the managed land sectors.
- **Economic research** A limited amount of research so far, with the exception of some Ecoclimate Group and MAF initiatives, has been directed towards the economic implications of climate change, the physical impacts, and the policy implications. Among other factors, restricted capacity in this area is partly responsible for the paucity of work so far.

### **Agriculture and land-use change**

Livestock greenhouse-gas emissions can be addressed by scientific and Government policy initiatives. Continued funding will be needed to develop robust solutions for the sector to remain competitive, while retaining scope for targeted additional funding for mitigation and for understanding the adaptation needs of the sector. Ongoing investment will be needed to reduce agricultural emissions and improve efficiency in pastoral systems such as water storage, resilience to droughts, and capability to respond to adverse events. Solutions to mitigate livestock emissions must be practical and economically viable.

Measuring agricultural emissions will be important. Research must continue into reliable and accurate measurement and monitoring systems for agriculture emissions, at the farm level.

Soil carbon sequestration is considered to be an important area for research. Specifically, there is a need to determine its advantages with a thorough and impartial assessment based on relevant New Zealand science. We also support research into the current performance of New Zealand pastures as carbon sinks, and the investigation of methods, such as zero tillage, which can improve performance in this area.

Other areas of New Zealand agriculture research favoured by submitters included low-input forms of agriculture, biochar, animal nutrition and genetic methane reduction, the use of animal waste to produce energy, and resilient land management practices and adverse effects planning.

### **Recommendation**

28 We recommend to the Government that research be undertaken into soil carbon sequestration, specifically to determine its advantages on the basis of a thorough and impartial assessment of the relevant New Zealand science.

### **Forestry**

We are in favour of further research into the role of forestry sequestration in mitigating emissions, including investigation of the carbon sequestration rates of indigenous species

and management techniques to enhance them. More work on the benefits of indigenous forests, including a “field measurement” approach to assessment, may also be beneficial.

More work will also be needed on identifying marginal land with soil types that would be prone to collapse under exotic forest. New Zealand’s carbon monitoring system will need ongoing support and technical development. This suggests a need for the development of science in the areas of forest modelling, national-scale forest inventory, and web-based information systems. More investment in areas of new planted forest systems such as genetics, silviculture, forest management systems, harvesting, and economics, will be required.

### **Renewable energy and energy efficiency research**

More funding was requested for industrial technology and renewable energy research. A clean technology fund was suggested as an accompaniment to an ETS, to stimulate New Zealand-based economic development and employment in the clean technology sector, and to encourage the development of New Zealand-owned intellectual property with export potential.

Suggested areas for increased research were renewable energy sources, mechanisms for monitoring greenhouse gas production, alternative fuel sources such as hydrogen, carbon capture and storage, small-scale energy generation, and the comparative efficiencies of transport systems.

### **Impacts and climate change science**

There was support for research into the science of climate change, including investment in modelling climate change scenarios and predicting impacts. It was suggested that conflicting theories on the compilation of long-range weather forecasts be rigorously tested, and that research be commissioned into reasons other than anthropogenic emissions for climate change.

It was suggested that the Government investigate the feasibility of extending the remit of the GeoNet geological hazard monitoring system to assess threats to New Zealand and our economic zone from climate events. It was also proposed that the benefits of a warmer climate be investigated.

There were also calls for more research into the specific impacts of climate change on developing nations with which New Zealand has a relationship, the social and economic impacts of climate change on rural communities, and the impacts on agriculture and fisheries.

### **New Zealand-specific climate change research**

Research is being undertaken in New Zealand on climate change in order to

- understand the underpinning science of climate change
- address emissions reductions
- provide information for reporting on our current emissions
- derive high-quality information on climate-change impacts

- develop best practice for reducing emissions and adapting to changes
- improve the use of knowledge by connecting it to the needs of end-users.

It is important to improve our understanding of the physical effects of climate change and their implications for New Zealand, and to find ways to support our greenhouse gas inventory. New Zealand's climate is part of our comparative advantage in primary production, tourism, outdoor recreation, and our energy supply and use. In some areas, it may be possible to adapt overseas research to New Zealand circumstances. But New Zealand-specific research should be undertaken into the adverse effects of climate change on our principal sectors, and the opportunities that may arise from it. The Parliamentary Commissioner for the Environment noted that, in addition, it is important to understand the economic and social impacts of climate change on New Zealand, from both domestic and international sources.

New Zealand can lead the international science effort where unique aspects of our emissions profile are concerned, such as reducing livestock methane emissions. There are also research opportunities stemming from our interest in the Antarctic region. The implications of New Zealand-specific research for Māori, who are significantly represented in sectors of the New Zealand economy, are also likely to feature in future domestic climate-change policy (see chapter 9 of this report).

### **Rationale for research funding**

A broad price measure will not directly encourage complementary adaptation measures. However, some mitigation and sequestration measures may have complementary effects that assist adaptation; for example, planting on hill land for the purpose of sequestration may also help reduce soil erosion from climate change. Because of market barriers to mitigation technology research such as information failures, early-mover disadvantage and the large scale of investment needed, it will be necessary for the Government to fund and coordinate research.

Government funding for climate change research is provided primarily through FRST, and to some extent through MAF's Sustainable Land Management and Climate Change Plan of Action, some departmental budgets, and some industry funding for agricultural mitigation channelled through the Pastoral Greenhouse Gas Research Consortium.

### **Criteria for funding**

FRST funding is assessed against four criteria—economic, social or environmental benefits to New Zealand; the implementation pathway; research, science and technology benefits to New Zealand; and ability to deliver research results. The criteria are modified slightly for research and development proposals from businesses, to reflect different considerations including market, technology and capacity-building. Different weightings may be put on the criteria according to the particular research portfolio the proposal falls into. The Parliamentary Commissioner noted that another important consideration is to ensure robust analysis, and that climate change research is transparent and open to peer review.

**Balancing the investment**

In climate change research consideration must be given to the balance between research into net emissions reductions and planning for expected impacts. In New Zealand, investment in adaptation is about half that for mitigation.

The provision of technology-neutral support comes at the risk of distorting the selection of technology by the market and offsetting the ability to concentrate resources on more promising areas of research and development. In continuing potentially competitive research work it will be important to balance concentration on a small number of areas of research against the learning benefits of working on a wider range. Higher-level research will lead to the maturation of our research profile, while focus on particular areas of expertise will mean more efficient concentration of knowledge and information in areas where it can be best developed and applied.

MAF's dedicated technology transfer programme in climate change covering the land-based sectors is the only one of its kind. It is conducted through a process initiated by landowners using the Sustainable Farming Fund and through the national strategy on technology transfer in climate change.

**Research and development**

If New Zealand is to capitalise on technological change, more focus on research and development opportunities will be essential. If we are to reduce emissions substantially, new technology will be required. There will be heavy global demand for new technologies when the price on carbon removes current barriers, and New Zealand is well positioned in some industry sectors including agriculture, geothermal energy, and forestry, to capitalise on its expertise.

By increasing the cost of greenhouse gas emissions, the ETS should encourage changes in quantities, types, and methods of production, to reduce emissions. This can to some extent be brought about by making existing emissions-reducing technologies more viable. It will also increase opportunities to profit from developing such technologies, and so should be expected to increase technology-based research and development and innovation.

Funding of research and development should be directed to stimulate these technologies and give New Zealand a competitive advantage. Some pertinent initiatives are in progress, including the recently announced Primary Growth Partnership and the associated Centre for Agricultural Greenhouse Gas Research. However, if New Zealand is to capitalise on technological changes, it will need an intense focus on research and development.

**Recommendation**

29 We recommend to the Government that funding research and development be directed toward giving New Zealand a competitive advantage in the future, allowing it to capitalise on its expertise in sectors such as agriculture, geothermal energy, and forestry.

**Ongoing monitoring and review**

Periodic monitoring and review of the Government-funded research portfolio will be necessary to ensure its continued relevance. The New Zealand research portfolio will

continue to be influenced by factors such as changes in technology, movement in the international understanding of climate-change science, and the interaction of research and other climate-change policies. It will be necessary to ensure New Zealand's research is integrated with international efforts in climate-change research, and to create momentum for complementary work overseas on research areas of interest to New Zealand.

### **Coordinated approach to policy**

We support the newly-formed multi-science agency, the New Zealand Climate Change Centre, which will bring together capabilities from across the science system with a particular focus on climate change and adaptation. It will be essential to take a coordinated approach to developing climate-change and adaptation policy. Key functions for such an organisation should include the following:

- coordinating climate-change research that is relevant to New Zealand
- communicating climate-change science to the public, policy-makers, local authorities and other stakeholders (including Māori)
- helping participating organisations to develop and apply cost-effective and sustainable science-based solutions to mitigation and adaptation
- building New Zealand's research, technical, and policy analysis capabilities by recruiting and retaining appropriate expertise, acquiring the needed tools, and better education and training
- suggesting measures to incorporate climate change and adaptation requirements into consideration of all public infrastructure spending
- improving public understanding of climate change issues
- improving the quality of policy debate and policy outcomes.

### **Integrated science, economic, and policy studies**

It was suggested by the Parliamentary Commissioner for the Environment that New Zealand needs to establish and support research capability that integrates science, economics, and policy studies to inform domestic and international climate policy. Finding a better equivalence metric for comparing emissions of different greenhouse gases is an example of an important issue for New Zealand that requires this type of research. She recommends the establishment of independent climate-change research capability that integrates science, economics, and policy, so that significant and complex issues like the global warming potential of methane can be addressed.

The Parliamentary Commissioner also recommends that a dynamic Computable General Equilibrium model of the New Zealand economy be developed that is able to deal adequately with land use, and that the model be held in the public domain so that it is freely available to accredited researchers. This would provide for transparency and robustness.

## Recommendation

30 We recommend to the Government that New Zealand-specific research be conducted into the adverse effects of climate change on our principal sectors and the opportunities that might arise from it.

### Arguments for additional measures

In the context of a perfectly-functioning price measure (where the market responds fully to the price), additional measures to reduce emissions would theoretically be undesirable, as they would move activities away from the efficient level achieved in response to the price. Such a market would take a number of years to develop, and in practice there are likely to be market failures, where non-price barriers prevent the market from responding to a price signal. Market failures are likely in areas such as improving energy efficiency, where studies in New Zealand and overseas suggest that existing financially viable opportunities to improve energy efficiency are not being taken up.

Market failures that may warrant the use of non-price-based measures include the following:

- **Information barriers** Without adequate information, individuals and organisations may not exploit cost effective emissions-efficient processes or technology because it is too time-consuming or too complex for them to assess alternatives. Examples of measures to remove information barriers include energy-efficiency ratings labels on appliances and smart electricity meters (which can provide real-time information on the price and consumption of electricity in the home).
- **Split incentives** In some cases, the costs and benefits of responding to a price may be shared by more than one party. For example, landlords may have a weak financial incentive to retrofit rental properties with energy-efficient appliances or insulation because tenants benefit most from the results and it is difficult for the landlord to recoup the full benefits of the investment. Conversely, tenants experience the benefit of reduced energy costs, but may have a limited incentive to make long-term investments in efficiency in a short-term tenancy.
- **Early-mover disadvantage** An emissions trading scheme should spur the development and uptake of new technology by creating demand for low-emissions products and processes. However, firms pioneering low-emissions technologies or processes may bear higher initial costs than later adopters, who share the benefits at little cost to themselves.
- **Insufficient price incentive and certainty** In the short to medium term, existing carbon prices may not be sufficient to provide incentives to develop and deploy new technology with long-term pay-offs, and there may be insufficient certainty about long-term prices to justify speculative investment.

- **Capital constraints** Reducing emissions reductions often requires a capital investment in plant and equipment. Even where the investment is economically viable, a person or firm may not be able to raise the necessary capital, or may not make a rational decision about the short-term costs of action compared with the long-term benefits of emissions reductions. For example, inefficient electric resistance heaters are much cheaper than more efficient heat pumps or wood-burners.

Non-price-based measures may be transitional until the market is fully functional and covers all sectors. Until market responses to the price measure mature, periodic review of performance is likely to be an important component of any package of non-price-based measures adopted. For example, better information services may develop in response to demand for information on best-practice technology, or increased awareness of energy costs may lead to tenants prioritising energy-efficient rental properties, allowing landlords to recoup energy efficiency investments in rent).

Māori communities will be particularly vulnerable to the impacts of climate change. In general, lower socio-economic groups are worst placed to meet the costs of an emissions trading scheme, which could have adverse health and economic effects. It is important that a full array of assistance measures are adequately considered and targeted at the more vulnerable communities and members of the economy (whether Māori or not).

### Recommendation

31 We recommend to the Government that significant ongoing investment be made to reduce agricultural emissions and improve efficiency in pastoral systems.

#### A market price as insufficient incentive for abatement

We heard arguments for additional measures based on the belief that a carbon price does not provide incentives for sufficient abatement, either in aggregate or in a particular sector. In theory, it should be possible to provide incentives through a price-based measure for almost any degree of emissions reduction, by increasing the price or emissions constraint sufficiently. If the international (or any other) price level is considered insufficient, the most direct solution would be to increase the carbon price rather than to implement other measures. However, if certain sectors do not face the full price of carbon as a result of the design of the price-based measure (for example, to protect competitiveness in that sector), there may be a justification for an additional measure provided it does not compromise the objective protecting the sector from the full price in the first place.

The inelasticity of demand responses to a carbon price has been cited as a reason for additional measures (for example, in the transport sector). However, inelastic demand may simply reflect consumers' choices and priorities, rather than any failure of the price-based measure. For example, in the transport sector, drivers may value the use of less fuel-efficient transport modes highly and prefer to cut back on other spending in response to fuel prices. This is consistent with the use of a price-based measure to allow market participants to decide the appropriate response to the price and to reduce overall emissions most efficiently. However, in other cases an inelastic demand may in fact be caused by market failures (such as inadequate consumer information about the long-term costs of purchasing vehicles with low fuel economy), which may warrant corrective action.

### **Additional support for abatement activities**

We were presented with arguments that various activities should receive support in addition to the market price. The rationales for the suggested additional assistance are not always clear. In general, providing additional support for various activities will run counter to the objective of a price measure of allowing participants in the market to choose the level and type of activity they undertake.

However, there may be co-benefits from an activity that is not recognised by the emissions price (for example, erosion control benefits from afforestation on marginal land). In such cases, additional measures may be justified. It will be important to ensure the non-abatement purpose is clearly identified and the proposed policy is the best method of promoting the co-benefit.

In other cases, implicit market failures may prevent the transmission of the price for the activity, which could justify the use of additional measures to correct the market failures.

### **Addressing the effects of the NZ ETS on particular groups**

There are arguments for additional mitigation measures, such as better home insulation and energy efficiency, on the basis that they can mitigate the impact of an emissions price on low-income earners or other disadvantaged groups. These measures essentially amount either to co-benefits or to measures to ease the transition to paying the full price of emissions, or a combination of both. In either case, implementing additional measures may be justified—arguments for and against transitional measures are covered in detail in the previous chapter and co-benefits in the section above.

## **Recommendation**

32 We recommend to the Government that a full array of assistance measures be adequately considered and targeted at rural communities, lower-income households, and other members of the economy who are likely to be more vulnerable to the impacts of climate change and less able to meet the costs of an emissions trading scheme.

### **Additional measures to ensure emission reductions in New Zealand**

Some submitters argued that additional measures should be taken to ensure emission reductions are realised in New Zealand (rather than buying units from overseas) because local action to reduce emissions is more desirable than emissions abatement overseas. The arguments include the following:

- International abatement lacks environmental integrity.
- New Zealand should ensure a proportion of domestic abatement to maintain credibility in international climate change negotiations.
- Future international agreements will contain more stringent emissions obligations, making it desirable to have a larger proportion of emissions reduction from domestic sources in preparation for increasing commitments.

Some of us consider that these arguments have limitations. First, while there may be environmental weaknesses in international arrangements, they should be balanced against the importance of supporting global agreements. Second, the arguments are premised on a

lack of confidence in agreed international frameworks for trading. Thirdly, business is probably as well placed to assess the risks of future price increases and take measures to mitigate them as the Government.

An alternative approach would be to increase the emissions price, or use restrictions on importation of units to ensure more abatement was carried out in New Zealand. It should be recognised that either approach would have an economic cost; either fiscal and regulatory costs in the case of additional non-price measures, or an increase in the cost of compliance with obligations in the case of import restrictions. However, a restriction on imports would be more consistent with the rationale for using a price measure to allow the market to determine the correct level of activity.

### **Providing incentives and disincentives**

We received suggestions that “positive” incentives to reduce emissions (such as providing units for project-based emission abatement, or the adoption of tax incentive regimes) should be implemented rather than relying solely on the “negative” disincentive of an emissions obligation under a tax or trading scheme. Arguments for such measures might include their promotion of more general acceptance of climate-change policies, and facilitating the development of a wider range of responses.

The creation of a price via a carbon tax or trading scheme would simultaneously create both incentives for emission reduction activities and disincentives for emissions. The existence of an obligation should create a market for developing innovative technology, projects, and services to reduce emissions, and lead to opportunities for profit. In the context of a perfect market, generally, if a price does not lead to the expected level of such activity, this might indicate that a market failure needs to be addressed, or that the benefits of the activities in question do not outweigh the costs.

### **Evaluating non-price measures**

It is important to recognise that some non-price-based measures will come with an implicit cost, in the form of either increased Government spending or a regulatory imposition on business. Furthermore, unless addressing a market failure, additional measures will theoretically move the market away from the efficient position that is achieved in response to the price measure.

The existence of a market failure or co-benefit may not in itself be enough to justify additional measures. It would be necessary to determine the extent of the market failure, or quantify whatever other objective the Government wished to achieve. As in any other area of Government spending or regulation, it will be important to assess the costs and benefits of proposed measures against alternatives.

Once additional measures have been established, it will be necessary to periodically monitor the performance of measures against their objectives, and in the context of the package of price and non-price measures to reduce emissions.

### **Concluding remarks**

The NZ ETS is an important means of playing our part in dealing with climate change. However, it may be necessary to supplement it with policies to improve its effectiveness.

No single policy option can meet all of the criteria for effective mitigation of greenhouse gas emissions in New Zealand. A mixture of mitigation policies will be necessary to equip New Zealand for a carbon-constrained future. Market-based schemes have demonstrated the best international track record at reducing emissions compared with other regulatory options. A broad price-based measure could be central in influencing both producers and consumers to reduce emissions, because it provides for a long-term transformation of the economy in order to account for our emissions. However, there is still a case for other policies and measures to be applied.

We recognise that there are two major adaptation concerns. Domestic adaptation is necessary and infrastructure should be established with climate change, and support for Pacific nations is also necessary and in line with the UNFCCC principle of helping vulnerable developing countries meet the costs of adaptation.

We consider that continuing New Zealand-specific climate change research and monitoring is essential. This research should encompass both the science underpinning climate-change theory itself, technology to reduce emissions and the methods to measure reductions, and integrated economic, science, and policy aspects.

New Zealand should also continue with, and enhance, its climate change research initiatives and seek to lead the international research effort in the area of agriculture emissions reductions.

## **Recommendations**

33 We recommend to the Government that the Emissions Trading Scheme be supplemented with policies to improve its effectiveness and that any policies that undermine its effectiveness be identified.

34 We recommend to the Government that a comprehensive study be undertaken to identify and assess existing and potential complementary measures specific to New Zealand.

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## 11 Minority views

### Labour Party minority view

#### Introduction

The evidence and analysis presented to the committee makes a compelling case for New Zealand taking an active approach to addressing the clear threat that unmitigated climate change presents.

The scientific case for action is clear; the moral imperative clearer.

There is strong support for a world-class ETS that would take account of New Zealand's special circumstances. The community is calling for a wide political consensus to underpin the ETS.

Parliament should now be aiming to pass a bill amending the ETS so as to signal that the core of New Zealand's response to climate change is based on principles that will endure in successive Parliaments.

The Labour Party would support the passage of a bill that

- confirmed an "all gases, all sectors" approach (that is, including agriculture and forestry in the New Zealand ETS)
- adjusted the timing of entry of the stationary energy and industrial processes sectors, to allow the necessary detailed design work to be finalised, but otherwise left sectors to enter on the dates specified under the current law
- contained responsible transitional measures
- strengthened consultation procedures.

#### Need for consensus

Climate change is a most difficult policy issue, requiring difficult trade-offs in the face of often emotional claims about the cataclysmic consequences of action, or inaction, depending on the claimant.

An agreed policy position will send a clear message to those on the fringes of the debate that their efforts have come to nought. An agreement that demonstrated that parties have been prepared to come together on the matters on which they agree, while accommodating some views that they would not have arrived at alone, would only strengthen the signal that an agreement will send.

To be enduring, any such agreement has to address New Zealand's unique situation, in a way that credibly enhances our reputation as a country that takes the environment seriously. To be credible an agreement must also be affordable, and avoid clearly unsustainable transfers to particular sectors of society.

**Principles underlying Labour's approach**

Climate change is an issue that New Zealand needs to address at a global, regional and national level.

Labour recognises that New Zealand cannot possibly affect the pace and nature of climate change—we are too small. But we must be part of concerted international action under the UNFCCC, to stabilise greenhouse gases at safe concentrations levels. Securing a global agreement to reduce concentrations of greenhouse gases in the atmosphere to prudent levels on a prudent timetable is the ultimate goal.

Regional and national actions need to combine implementing New Zealand's global obligations (a reactive policy) *and* demonstrating that New Zealand is prepared, with other like-minded countries in comparable circumstances, to show leadership by taking on obligations in advance of a global agreement covering developing countries (a proactive policy).

Policies have to be effective to be credible. New Zealand emissions of greenhouse gases are high on a per capita basis and growing. Any policies have to be sufficiently powerful to turn this trend around eventually.

Policies have to address the specifics of New Zealand circumstances. New Zealand's largest and fastest-growing sources of emissions are agriculture, forestry, and transport. We return to this issue in more detail below.

Policies have to be enduring to be effective. If the behaviour of consumers and producers is to change, both groups have to be convinced that climate-change policies are here to stay. Policies that are seen as political and likely to be reversed at each change of Government will not be credible and will therefore not be effective.

Policies also have to be fair in the relative treatment of consumers and producers and of different sectors.

Addressing climate change will have costs as well as benefits. But New Zealand should seek to take action at least cost, not at any cost.

Market-based mechanisms are preferred, as they allow individual consumers and producers to discover the least-cost ways of achieving any given environmental outcome. But strong complementary measures are also essential.

Climate-change policy should be developed in a transparent, consultative process, with independent assessment of the costs and benefits of proposals.

**Addressing New Zealand's issues**

We have heard much evidence comparing policies proposed in New Zealand with those proposed in other countries; in particular, various submitters have suggested that New Zealand should follow closely the policies proposed in Australia.

While Labour agrees that New Zealand should align itself with Australia when it is in our interest to do so, care is needed to ensure that we do not import policies designed to solve problems that do not exist here.

In New Zealand, most greenhouse gas emissions come from agriculture and transport, and are offset by large removals via the forest sector. In Australia, energy (especially electricity generation) is the main issue.

It is hardly surprising, therefore, that the proposed Australian Carbon Pollution Reduction Scheme focuses on the energy sector and gives less weight to forestry and agriculture.

### **Specific comments on majority report**

We have a number of major concerns with the analysis and conclusions of the majority report.

The report fails to detail entry dates by sector, nor does it demonstrate sufficient commitment to the all-gases, all-sectors approach.

There is no specific mention of agriculture in connection with sector entry dates. This is a major failing. An ETS that did not cover New Zealand's largest source of emissions would be neither credible nor fair. Australia is not proposing to exempt coal-fired electricity from its scheme. The US is not suggesting that emissions from motor vehicles be exempt. New Zealand should follow suit and solve its principal pollution problem. We cannot continue to put this problem off.

We are concerned about the lack of commentary on the timeframe and cost of the alternatives to the phase-out of the free allocation of emission units for trade-exposed firms contained in the current law.

Allocation to trade-exposed industries based on a percentage of historical emissions is the most effective way to encourage emission reductions, because it preserves the marginal price signal. We oppose allocation on an intensity basis with an uncapped number of units allocated to those receiving free allocation in exposed industries. It would be environmentally irresponsible and would provide no long-term incentive for New Zealand-based polluters to reduce emissions, since many would simply choose to continue to purchase credits offshore rather than take meaningful steps to reduce emissions at home.

The status quo response to emissions is best. A second best would be intensity-based allocation to trade-exposed industry within a cap on the total number of emissions units allocated.

Capping the price of carbon would mean that emissions would not be reduced as much as they otherwise would, and therefore the cost of meeting our international commitment would be higher for taxpayers, and the environmental outcome would be poorer. This issue is especially important in respect of forestry. It is essential that there be no artificially low price for forest credits for those sequestering carbon or for deforestation emissions. Deforestation at low prices would bring forward and increase the loss of trees, at a cost of hundreds of millions of dollars to taxpayers.

Caps would also distort land prices. This would have a doubly adverse effect, with additional agricultural emissions on top of a disincentive to sequestration, as artificially high land prices would be unaffordable for forestry.

The Australian proposal to cap prices after the initial year is to cushion emitters from the effects of price spikes, rather than to provide a continuing subsidy.

The proposed legislation would impair forestry's property rights, blunt its incentive to plant and thus reduce emissions during the next three years; and it would blunt agriculture's incentive to start reducing emissions to avoid a price on carbon at the margin. This would mean that New Zealand would continue to subsidise carbon polluters to carry on with business as usual, while removing the incentive from the one sector with a big, early, lowest-cost opportunity to help the country meet its reduction commitments.

### **Targets**

The target for post-Kyoto reductions for the period until 2020 proposed by the Government is in many ways the worst of all outcomes. It is based, as most reputable commentators have noted, on very questionable modelling. It assumes a moderate price of carbon internationally, but little effort by the rapidly industrialising large developing countries or the USA. New Zealand would still face a moderate price burden, and the risks of industries moving to territories without emissions pricing or equivalent regulation would remain high. The outcome overall would be that the environmental objective would not be met.

The Government has demonstrated that it is not ambitious, either for the New Zealand economy or for the world environment.

A realistic worldwide ambition is in both New Zealand's environmental and economic interest. At higher prices for carbon, and with appropriate international rules around forestry, New Zealand's sinks would be a source of wealth creation for New Zealand.

### **Specific policy proposals**

The Labour Party regards the select committee process as a massive waste of public time and resources. We endorse the process concerns expressed by the Green Party. We also observe that, despite having insisted on the setting up of the committee and contributing a lengthy minority report, the Act Party has not deigned to attend most of the committee's meetings. It would have been far preferable for the Government to have tabled amending legislation to the existing law for the committee to consider.

We would prefer the law as it stands to continue in force without substantive amendment.

But in the light of public signals sent by the Government as to amendments under consideration, we would be prepared, for the sake of achieving long-term certainty and durability in an ETS, to discuss and consider supporting the following changes:

- altering the dates on which sectors enter the scheme, as follows:
  - the stationary energy, industrial processes and transport sectors on 1 July 2010
  - all other sectors from 1 January 2013 (no change)

- introducing into the ETS, from an early date, an agricultural emissions offset scheme, modelled on the current Waxman-Marley Bill proposals in the United States, with units being fully convertible into international units from the outset
- if there is insistence on a cap on the price of units, allowing one only for a limited and fixed duration, directed at reducing the impact of unexpected price spikes, and thus starting well above current prices, and applying to emissions, not removals
- if there is insistence on a different allocation model, providing free allocation to individual firms in trade-exposed sectors on the basis of their actual emissions (an intensity-basis), within a fixed pool of units (based on historical sector emission levels)
- strengthening statutory consultation procedures, including the establishment of a standing advisory committee on climate change.

If absolutely necessary to achieve consensus, we would also consider adopting the Australian proposal of a one-year fixed price for emission, but not removal, units provided that appropriate protection for the forestry sector could be agreed.

### **Conclusion**

The time for action on climate change is now.

Since the Rio Earth Summit in 1992, New Zealand has debated extensively whether, how, and when we should take action to fulfil our international obligations to be part of a global solution to climate change. But we have never been able to bring these debates to an agreed conclusion.

The Labour Party is committed to working in good faith with all other parties in Parliament to maintain a world-class ETS that shows that, as a country, we understand that environmental, social, and economic considerations are complementary, not in competition with one another.

Only by achieving that understanding will we be able to deliver to our children the bright future they deserve.

### **Green Party minority view**

The Green Party regrets that we have had to write such a substantial minority report. This is because many key issues in the report were never fully discussed by the committee.

The committee spent many weeks hearing submissions but without discussing the issues they raised, let alone forming a collective view on them. Then we did not meet for some weeks while advisers completed reports. We were mostly limited to two hours of meeting time a week. As a result consideration of the many issues raised by submitters was compressed into a few short meetings. In fact when we began our final meeting, at which we deliberated, more than half of the draft report had still not been discussed by the committee, and neither had any of the proposed recommendations.

A detailed examination of the existing ETS and debate about potential improvements would have been a worthwhile exercise. While the Greens voted for the 2008 legislation,

we were always open to considering changes to it. However, the terms of reference were extremely broad and required revisiting the whole question of whether action on climate change is warranted. We are glad the committee has come to the conclusion that climate change is a serious threat and that action to address it is urgent. However, we are disappointed that the report is so high-level that the committee has not formed a view on many of the key issues of design and implementation of an ETS. It is hard to see how it can contribute anything more to the decisions the Government will now make on amending legislation than the advice from their officials which they already have.

While we agree with the position the report takes on many of the terms of reference, such as the compelling nature of the science, the need for a strong international agreement at Copenhagen, the need for both mitigation and adaptation, the inclusion of all sectors and all gases, and the need for more research, there are two underlying themes in the report with which we do not agree.

There is a view running through the report that there is no particular value in making emissions reductions within New Zealand as we can purchase units from overseas to meet our commitments. Obviously if all countries tried to play this game there would be no emissions reductions anywhere. It relies on the assumption that emissions reductions will be cheaper overseas than here, yet New Zealand has many opportunities, particularly in energy efficiency, to reduce emissions at very low or even negative cost.

Furthermore, if New Zealand relies mainly on the purchase of units we will not make the structural changes to our economy needed to enable it to prosper in a carbon-constrained world. Much more stringent emissions cuts will be necessary globally after 2020, and once developing countries are themselves setting targets there will be no cheap units to buy. In addition, oil prices are expected to rise substantially once conventional supplies peak and the New Zealand economy is currently locked into high oil consumption. The Green Party believes it would be foolhardy not to take steps now to set our economy on a path to low emissions, which would have numerous other benefits as well.

We also disagree that complementary measures are inferior to a price mechanism and should not be necessary unless there is market failure—unless market failure is defined as widespread and permanent. We know of no country that is attempting to reduce emissions solely by raising prices, let alone any that have succeeded. The countries that have been most successful in improving energy efficiency and lowering emissions from the energy system have used codes and performance standards for buildings, products, and vehicles. A standard that simply excludes the least efficient refrigerators from the market is both simpler and less costly than raising the price of electricity so high that all consumers will take note of the energy efficiency rating when they buy a new fridge. A motorist may be incentivised to leave the car at home and take public transport if fuel prices rise, but cannot do so unless suitable public transport exists.

### **What sort of price on carbon?**

The Green Party has been calling for a price on carbon since 1993. Our preference for many years was a carbon tax because of its simplicity; the certainty it gives business on what the price will be, thus enabling investments in emissions reductions to proceed with confidence; and the opportunity for governments to use the proceeds to reduce other taxes. We do not believe the case for an ETS instead is overwhelming, but agree that is the

direction the world is going and there are some benefits in aligning with international efforts. We have therefore put our efforts since 2007 into ensuring NZ has the best ETS it can have.

### **Design of an ETS**

Given the mechanism of choice is a market trading in emissions units, it is important to allow the market to work. Interference with price or liquidity should be avoided. The Greens believe a successful ETS must

- be comprehensive (all sectors all gases)
- ensure emitters face the full market price at the margin
- ensure mitigators receive the full market price for the emissions they capture or avoid
- allow only units with environmental integrity into the system
- be fair in the sharing of the obligations.

Only the first of these has been endorsed by the committee.

We agree that trade-exposed firms need some protection while their competitors face no price on carbon. However, basing this protection on output creates an incentive to increase their pollution because it dilutes the price effect at the margin of their activities. A free allocation of units based on a proportion of historical emissions greatly reduces the cost of an ETS to those firms, without reducing the incentive to reduce emissions. The Greens strongly oppose an intensity-based allocation, which commits New Zealand to constantly rising emissions and rewards those responsible for them.

Similarly we oppose a price cap. The whole purpose of an ETS is to bring the international price of carbon into decision-making by firms and individuals. A price cap denies foresters and those reducing emissions the full value of their actions and would reduce the incentives for all mitigation actions. It would have the perverse effect of rewarding those who are causing the climate change problem and punishing those who are part of the solution. It would also delay the economic transformation we so desperately need to a low-carbon economy. Rather than cap the price, it would be better to return to a carbon tax.

The Green Party supports the position of the EU and Australia in opposing the import of “hot air” AAUs from countries who have a surplus of units because their economies collapsed just after the base year, 1990. It is true that these units are accepted under the Kyoto protocol, but this was negotiated when the US was expected to be a participant and a major purchaser of units. This would have created a balance of supply and demand which would not have forced down the market price of units. We believe “hot air” AAUs should be accepted only when an international or bilateral agreement recognises them as having been “greened” through investment in environmental projects.

Fairness in an ETS takes several forms. One has been addressed above—firms exposed to unfair trade competition from countries with no price on carbon need protection. However, this protection comes at the expense of taxpayers, and particularly households and small business, which have to pay both for their own emissions and for those of large firms. We agree with the recommendation of the Parliamentary Commissioner for the

Environment that there should be transparency in the wealth transfers that the ETS creates, and that the Controller and Auditor-General should report annually on how costs are being passed from emitters to taxpayers.

There is also a need to ensure fairness between sectors. Late entry for agriculture and high levels of grandfathering will impact badly on forestry. The exemption from a carbon price for farmers will tend to be capitalised in land prices, raising the value of marginal land so that it becomes unaffordable for forestry.

Linking with emissions trading schemes in other countries with which we trade, and as soon as possible with an international market, is desirable but only where these principles are not compromised. Linking with the proposed Australian scheme (if it is passed) would require us to distort our market by capping the price and allocating on an intensity basis. Linking with the EU would be less distortionary and would have the benefit of a more established and experienced market. However, we should not attempt to link with any country until there are common rules that meet the principles above.

### **Existing ETS**

We are not starting from scratch here in designing an ETS. NZ has an ETS in law now. It covers all sectors, all gases (though more slowly than we would have liked); it preserves the full price signal at the margin even for firms that are 90 percent grandfathered; it allows mitigators to sell units at the full international price; it excludes AAUs from other countries unless specific regulations allow them because their environmental integrity has been established. In our view the large wealth transfers from households and small business are too great, which compromises fairness; but there is a compensatory provision for households in the form of a large fund for home insulation.

We do not see any reason to change these fundamentals. Proposals for a price cap, intensity-based allocations, importing of AAUs, further delays for agriculture and the energy sector, and alignment with countries whose interests are very different from our own would compromise both its environmental purpose and its fairness.

There are measures that could improve the current ETS. They include

- increasing the transparency around free allocation
- putting more of the criteria for allocation in the primary legislation rather than in later regulations
- restricting the ability of foresters to get credits for destroying native ecosystems to plant pines, given that there is so much low-quality pasture land which could be planted instead
- improving the measurement of carbon in native forest
- making the rules for the Permanent Forest Sinks Initiative fairer for the landowner.

We are disappointed that there seems to be little interest in addressing these issues.

**ACT New Zealand Party minority view**

The Emissions Trading Scheme Review Committee was set up with terms of reference to examine 10 specific aspects of this policy issue and report to the House accordingly.

The essence of the matter is that New Zealanders are being asked to cut their incomes on the grounds that “science” has proven beyond reasonable doubt that future human-induced climate change is likely to be dangerous; that cutting greenhouse gas emissions is the best human response to this problem; and that an ETS is the most efficient way to reduce net emissions.

The UN IPCC asserts that the matter has been proven beyond reasonable doubt. But it is neither impartial nor authoritative. Its charter obliges it to focus on human actions as a source of climate change. The flaws arising from its lack of care and self-selecting and self-referential nature have been documented by many authors and to some degree by inquiries held by the House of Lords and the Wegman Committee report.

Its most strident conclusions and “calls to action” advocacy are the work of a relatively small number of the contributing scientists who do not speak for the scientific community as a whole. More than 30,000 scientists have signed the following petition:

We urge the United States government to reject the global warming agreement that was written in Kyoto, Japan in December, 1997, and any other similar proposals. The proposed limits on greenhouse gases would harm the environment, hinder the advance of science and technology, and damage the health and welfare of mankind.

There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gases is causing or will, in the foreseeable future, cause catastrophic heating of the Earth’s atmosphere and disruption of the Earth’s climate. Moreover, there is substantial scientific evidence that increases in atmospheric carbon dioxide produce many beneficial effects upon the natural plant and animal environments of the Earth.

As the IPCC reports freely acknowledge in places, there are major scientific uncertainties, for example those relating to clouds, convection, solar activity, aerosols and the chaotic nature of some climatic processes. The surface of the earth has warmed, off and on, since the 19th century—and indeed for millions of years—but daily headlines conveying evidence of warmth, floods or storms tell us nothing about whether humans are causing climate change. The surface cooled for a period in the middle of the 20th century and appears to have stopped warming during the last decade despite strong emissions growth during this period. There is no doubt from the historical record that natural variability causes major changes in the earth’s climate, sometimes in a relatively short number of years. Human-induced emissions growth could increase the global average temperature, but not necessarily to a dangerous extent.

Scientists who are most closely associated with the IPCC’s most confident assertions about attribution put heavy weight on simulations conducted by climate change models. However, models are inevitably simplifications of a more complex reality. They embody many parameters whose values are highly problematic, and cannot usefully model what is unknown. As long as CO<sub>2</sub> was rising along with global temperatures, it was easy for the

models to attribute the latter to the former. But the models did not anticipate the contrary movement in the last decade. The models need to be told what caused it; scientists can speculate about the cause, but proving it is commonly another matter.

Another difficulty is that the earth warmed by perhaps only 0.7 degrees Celsius during the last century while atmospheric greenhouse gas equivalents rose 41 percent from a pre-industrial level of 281 ppm to 396 ppm by 2007. Because the relationship between temperature and concentration is logarithmic, the increase from 281 to 396 ppm should theoretically produce 95 percent of the temperature effect of doubling from 281 to 562. It follows that if 0.7 degrees were 95 percent of the full effect, humans should not be worried. The IPCC argument to the contrary is that 0.7 degrees can be nowhere near the full effect of the estimated 41 percent rise in atmospheric greenhouse gas concentrations. Instead, it conjectures that a much larger full effect is being delayed because of the temporary absorption of heat by the oceans. In due course that heat will be released in some form. Since it is not easy to measure the overall thermal content of the oceans of the world or to understand convection effects, this conjecture continues to be disputed. Other measurement controversies include whether the ocean level is rising on average and, if so, whether this is due to greenhouse gas emissions.

Given these uncertainties and measurement controversies it is easy to see why so many scientists consider that there is no convincing evidence in support of the alarmist propositions that are being used to steamroll politicians into making rash promises on climate change that they cannot implement successfully.

For policy-makers the bottom line is that if the climate is being driven by large natural but ill-understood forces, global governmental action to reduce emissions growth might be neither necessary nor effective. This is why ACT and many others argue that the extent of governmental global action should be conditional on the strength of actual scientific observations (as distinct from modelled simulations) that human actions are causing observed climatic outcomes. Climate change models do not constitute observational evidence. Furthermore, as Bjorn Lomborg has pointed out, spending large amounts of money to bring about a minuscule reduction in temperatures is a poor use of resources from the perspective of both current and future generations.

Finally, even if it was considered desirable to respond to such evidence as there is—for example, by application of a precautionary principle, or to be seen to be “playing our part” internationally, or to avoid risks of formal or informal trade restrictions—it is unlikely that an ETS is the most efficient policy solution. A low-rate carbon tax and subsidy scheme is a more appropriate initial step, with any advance from there dependent on the advance of scientific knowledge and on a fully international effort to reduce emissions.

### **Responses to the terms of reference**

The following sections deal with, in turn, the items of the terms of reference of the committee.

### **Views from trade and diplomatic experts on the international relations aspects**

The case for New Zealanders to “do their bit” to save the planet is not in itself a case for Government action. New Zealanders can, and do, “do their bit” as they see fit to reduce

their energy consumption without any carbon tax and without any hectoring from Greenpeace and other alarmists.

New Zealanders do not have a large “carbon footprint” amongst the relatively wealthy countries for their own consumption of goods and services. It is the farm products that are exported for world consumption that lift the carbon emissions per capita attributed to New Zealanders. Shifting the production of those products to other countries might make New Zealand look better in some comparative tables, but it could increase rather than decrease global emissions.

Mitigation by New Zealanders, tax-induced or otherwise, can produce no discernible climatic benefits for anyone. New Zealand emissions are too small to make a difference. The committee was advised by officials that New Zealanders should have to pay a carbon tax or ETS equivalent anyway—for the same reason that taxpayers have to pay taxes even if their individual contributions are minuscule. However, taxpayers should be happy to vote to pay a minuscule amount in taxes as long as the benefit is commensurate. To ask New Zealanders to vote to pay higher energy prices for no climatic or other benefits would be like asking them to vote to be taxed for no compensating benefits. Regardless of the human-induced warming issue, New Zealanders will have to adapt to any future changes in the climate, just as they have to adapt in their markets.

Another argument is that it is in New Zealanders’ interests to pay higher energy prices in order to reduce domestic emissions because this will alter the behaviour of other countries. One suggestion is that mitigative action by New Zealanders might induce the rest of the world to follow suit and alter the global climate for the better from the perspective of New Zealanders. But it is so implausible that New Zealand actions could have a material influence on mitigation by China, the United States and India that it is no wonder that no expert attempted to make this argument.

Another suggested benefit for New Zealanders from voting for higher energy prices is that their participation in such global action would avoid adverse international trade and diplomatic repercussions. New Zealanders have rejected this argument in the past in relation to the nuclear-free issue; it is conceivable that they might do so again.

Wealthier countries like Singapore and Hong Kong are promising far less action than New Zealand and no case was made to the select committee that they are suffering as a consequence. Much larger countries such as Canada, Australia, and the United States have at various times stood aside from the issue to a greater extent than New Zealand.

The committee considered advice on whether border taxes might be imposed on countries that were not seen to be pulling their weight on the global warming issue. We were advised that border taxes could breach WTO rules and would be very difficult to implement and of doubtful effectiveness. They observed that there was a “strong wish” by trade ministers at the Bali meeting to avoid talk of trade sanctions and focus instead on positive incentives.

Another point is that any feasible action by New Zealand (or any other country) is bound to be criticised by alarmists and self-interested parties for not going far enough. Protectionists will use the food miles argument to try to disadvantage exporting countries regardless of what New Zealand does. The relevant question is whether taking more rather

than less action would make a worthwhile difference in this respect. It is understood that Fonterra, for example, regards its own moves to provide labelling information on the carbon content of its products as more relevant to its customers than official New Zealand policies.

ACT concludes that the case that a carbon tax might help New Zealanders avoid material adverse international trade and diplomatic repercussions is not strong and needs to be quantified. New Zealanders might be prepared to pay something to see New Zealand “playing its part”, but no case has been made to date that they would wish to pay anything like the substantial costs of a commitment to reduce emissions to 10 percent or more below 1990 levels by 2020.

### **Consider the prospects for an international agreement post-Kyoto and the form this agreement might take**

The committee was advised not to expect a comprehensive international agreement to be reached in Copenhagen. There is a deep divide between Annex I countries and other countries and a considerable reluctance amongst the latter for binding commitments. The emissions trading framework, which is associated by some with the Kyoto Protocol, may not be perpetuated.

The lack of attention to scientific uncertainties might underlie the bald assertion that future climate change obligations will become “increasingly stringent” for countries. It is not clear whose view this represents, but it could reflect an inability to assess the scientific uncertainties independently of the IPCC’s bias. The fact of the matter is that it is not known whether new information will strengthen or weaken the alarmists’ case for “urgent, decisive” action.

ACT’s conclusion is that agreement by China, the United States, and India to binding commitments of a stringent nature is unlikely in the immediate future. We agree that New Zealand should be seen to be willing to play a part in any fully international effort to reduce global emissions. Thus the conditionality attached to the Government’s targets for 2020 is sensible and prudent.

### **Require a high-quality quantified regulatory impact analysis to be produced to identify the net benefits or costs to New Zealand of any policy action**

No such report was presented to the select committee. Since no analysis means no sound basis for taking policy decisions has been established, this omission fundamentally undermined what the select committee could hope to achieve in reporting back to the House of Representatives.

The NZIER and Infometrics modelling work assisted the committee in assessing some aspects of the costs of an ETS or a carbon tax. That work did not purport to be a regulatory impact analysis and it was not one, as officials have confirmed.

A regulatory analysis needs to evaluate likely benefits in relation to likely costs. The models used by the NZIER and Infometrics are not capable of estimating the likely benefits for New Zealanders from avoided adverse international diplomatic and trade repercussions from not participating in global action. As a result, the NZIER and Infometrics modelling

work did not establish (and was not intended to establish) whether it was plausible that New Zealanders would derive positive net benefits from a carbon tax or an ETS.

A regulatory analysis also needs to identify alternative courses of action and identify the option that maximises net benefits. Alternative courses of action include the choice between a carbon tax, an ETS with an uncapped price, an ETS with a capped price, and regulatory measures. The models could not easily distinguish between a carbon tax and an ETS and so were not very helpful in this respect. (They modelled an ETS as if it were a carbon tax.) Another option, suggested by Australian economist, Geoff Carmody, is a tax on domestic consumption of carbon rather than on domestic production of carbon. (The effect would be to exclude much of agriculture.) The models could throw some useful light, however, on the costs of any obligation to purchase units overseas and on options for using the revenue from a carbon tax.

As New Zealand has found with the previous Government's ill-justified Kyoto obligations, a binding commitment to cover shortfalls by purchasing emissions units overseas has the potential to be very costly. Problems of "hot air", fraud, misrepresentation and unacceptable enrichment are likely. New Zealanders who wish to transfer money overseas for worthy causes already do so, and our official overseas aid programme supplements this activity. No case was made to the select committee that purchasing emissions units overseas would make a better contribution to global welfare than the use of those funds in better-targeted ways. If the purpose of spending that money is to appease international opinion in relation to climate change then consideration needs to be given to the optimal way of appeasing that opinion. If the purpose is to raise global welfare then it seems unlikely that purchasing "hot air" units is optimal. Moreover, by reducing national income, a carbon tax makes overseas aid less affordable.

We were advised that non-Annex I countries wealthier than New Zealand are amongst those thinking of taking domestic action to reduce emissions that falls short of making "firm future commitments".

ACT suspects that the reason why no regulatory impact analysis has been produced that credibly establishes a positive net benefit for New Zealand from mitigative actions is that none can be produced. However, the hypothesis should be tested by the Government undertaking one, as the Cabinet Manual requires.

**Identify the central/benchmark projections that are being used as the motivation for any climate change policies and consider the associated uncertainties and risks**

The majority report usefully summarises the central scenario projections, but it does not comment on their relative reliability or their absolute reliability for policy purposes. ACT has no confidence in the ability of scientists, or IPCC bureaucrats, to predict future changes in energy-related technologies successfully. Although the majority report endorses the opinion of an adviser that "recent scientific analysis of actual trends .... strongly suggests that worst-case IPCC projections are being realised", ACT has not seen any evidence that the IPCC projections anticipated the lack of warming in this decade to date while emissions have grown strongly.

**Consider the impact on the New Zealand economy and households of any climate-change policies, having regard to the weak state of the economy, the need to**

**safeguard international competitiveness, the position of trade-exposed countries, and the actions of competing countries**

The analysis presented to the Government suggests that achieving a 10 percent reduction on 1990 levels by 2020 would reduce income per person in that year by \$1,400. Summed over 4 million people that is almost \$6 billion a year.

ACT does not believe that New Zealanders at large would be prepared to incur costs of this order for no demonstrable benefits. The threats of adverse international action would have to be much greater than they appear to be currently to warrant the acceptance of such costs.

Moreover, the NZIER and Infometrics modelling takes no account of the Government's primary economic goal of achieving per capita income parity with Australia by 2025. The higher growth rate that this will require implies higher emissions and a greater cost of meeting the "10 percent below 1990" emissions reduction target. This scenario should be analysed as part of the regulatory impact statement.

**Examine the relative merits of a mitigation or adaptation approach**

New Zealanders can choose whether to mitigate, and the regulatory impact case for Government action has yet to be made.

Non-adaptation to real adverse events is not an option. New Zealanders have always had to adapt and respond to global events, particularly those that affect overseas markets, world peace, and communicable diseases. We have always had to anticipate and respond to natural disasters.

In fact, New Zealand already has, in the view of at least one authority, a world best-practice civil defence agency to deal with natural environmental hazards. It is called GeoNet. GeoNet provides evidence-based information about short- and long-term hazards like earthquakes, volcanic eruptions, tsunamis, and floods. In principle it could easily monitor underlying trends in New Zealand's temperature or sea level in order to ensure that any risks of longer-term climatic changes were identified and cost-effectively managed.

ACT considers that New Zealanders would be better informed by an agency that focused on assessing risks from trends in actual observational data rather than by NIWA, which has focused to date on making alarmist temperature projections for New Zealand based on heroic regional "interpolations" of data from unproven global climate-change models. It suggests that GeoNet could be commissioned to report on what can be said on the basis of actual evidence about climate change in New Zealand.

Currently, ACT has seen no observationally-based evidence of any warming trend in New Zealand that would be grounds for concern. NIWA accepts that New Zealand warming might be only two-thirds of any global temperature increase. Plausibly this might be beneficial for New Zealanders for many decades at least.

**Consider the case for increasing resources devoted to New Zealand-specific climate change research**

ACT considers that more research could usefully be done on biological and chemical ways of reducing agricultural emissions. Barring scientific breakthroughs, reducing agricultural emissions while maintaining production levels would be very difficult.

ACT also considers independent research needs to be done on temperature and sea-level trends. NIWA has acted too much as if it is the New Zealand branch of the IPCC. Governments cannot rely on one source of advice on matters of such importance. The Government should commission independent expert assessments of the margin for error in NIWA's projections of New Zealand's temperature out to 2080 and further. Those assessments should be used to revisit the guidance being given to local authorities about likely future climate changes.

Above all, ACT considers that the issue of whether New Zealanders would be likely to regard themselves as better off or worse off from moderate warming needs to be assessed. Otherwise, New Zealand's international negotiators are simply "flying blind" on whether they should be urging other countries on with mitigation, or holding them back.

**Examine the relative merits of an ETS or a tax on carbon or energy as a New Zealand response to climate change**

Many submitters to the select committee favoured a carbon tax. Internationally, expert economists widely favour a carbon tax.

Between the two options, ACT favours a carbon tax coupled with an equivalent subsidy for carbon sinks, and reductions in income taxes. It does so primarily in order to preserve incentives to invest in energy-intensive industries in New Zealand (for a given average level of carbon tax). Prices for units internationally under an ETS have been very volatile and greatly influenced by non-transparent political decisions. A period of unexpectedly high prices for an ETS could destroy the viability of some New Zealand firms or industries, even if the average price over a longer period of time were no higher than the average rate of a carbon tax during the same period. For example, ACT understands that unless it were exempted, New Zealand Steel would face a \$20-million annual impost from a \$10/tonne tax. It is easy to imagine an overseas (or domestic) owner deciding to pull the plug on a New Zealand operation that had a period of major losses under an ETS. Proponents of an ETS assert that firms could use future contracts to hedge against this risk. However, such markets might not exist and a carbon tax could achieve the same purpose without the need for firms to incur the transaction costs and counter-party risks associated with hedging. So this response effectively concedes the investment argument in favour of a tax.

A tax would also avoid the costs associated with setting up a market in emissions units. It might also lend itself less to fraud or corruption associated with the allocation of emissions units. If the tax were administered by the Inland Revenue Department, one could be more confident that such pressures could be resisted.

None of this is novel. There is widespread agreement among top economists that a carbon tax is a superior mechanism. Former US Chairman of the Council of Economic Advisors, Greg Mankiw, has recently written that "A carbon tax is the remedy for climate change that wins overwhelming support among economists and policy wonks".

A number of Governments have implemented carbon taxes. The attachment of others to trading regimes is often for political reasons—because they are unwilling to impose the same level of tax by transparent means.

Arguments against a tax are commonly invalid. Like an ETS it is a market-oriented mechanism.

Since an ETS system—if fully adhered to—provides greater certainty about the achievement of a quantity target, the proponents of an ETS commonly propose that achieving the quantity target is more important than price certainty. However, any quantity target for New Zealand is arbitrary and any errors in setting it cannot conceivably affect global warming. Moreover, under the system being designed, an ETS does not determine the quantity of New Zealand emissions any more than a carbon tax would. This is because the designed ETS would allow New Zealanders to exceed the domestic target at will by purchasing emissions units offshore. In practice under either arrangement, Governments would have to adjust emission quantities or the level of carbon tax through time if they want to achieve a domestic emissions target. Either way, achieving an emissions target will be a trial and error matter.

ACT questions the Minister for the Environment's hypothesis that an advantage of an ETS is that prices will be low during an economic downturn and higher when the economy is buoyant, and thus cushion economic activity. If Governments really thought this was a good thing they could adjust tax rates pro-cyclically. But in practice fluctuations in global or domestic unit prices will be influenced by many other considerations, and business cycles in New Zealand may not correspond with business cycles overseas. The economy will adjust more smoothly if firms and households are faced with a stable price of carbon under a tax than volatile prices under an ETS. There is also a political advantage in terms of the acceptability of the scheme if households and businesses do not have to be nervous about the cost they will face.

Officials correctly observed that under both a carbon tax and an ETS there would be difficult measurement issues with respect to the carbon content of what is to be taxed. What they did not discuss was the option of a low-level energy tax. This option would be much simpler and avoid those difficulties.

Officials proposed two other reasons that they saw as tending to favour an ETS. One was that other countries are moving in that direction. However, some have carbon taxes, and a carbon tax can be transformed into an ETS if a deep international trading market develops. This was acknowledged in the NZIER/Infometrics report and was the recommendation of the Productivity Commission in Australia. We were advised that it would not be problematic for New Zealand to adopt a carbon tax even if Australia stayed with an ETS. ETS regimes are often favoured for political reasons (because their tax effect is disguised).

The other reason suggested as favouring an ETS is that it would confront our businesses with an emissions price that is “in tune with the economic climate that they, and their competitors, face”. This is akin to the fallacious argument New Zealand should subsidise agriculture because the EU subsidises agriculture. A carbon tax should be set at a level that achieves New Zealanders' objectives, not someone else's.

**Consider the need for additional regulatory interventions if a price mechanism is introduced**

The simplest approach for New Zealand, if there is a need to be seen to be playing our part, or because of trade or international relations concerns, would be to plan conditionally to introduce a low-level energy tax. Depending on what other countries are doing, there may be no need to pad this out with other measures. Regulatory measures such as energy efficiency or home insulation policies are more distorting than market-based mechanisms (a tax or an ETS). In effect they create a series of different carbon prices in the economy.

**Consider the timing of introduction of any New Zealand measures**

Because New Zealanders would be likely to benefit from moderate warming and there is no real evidence that even this amount of warming will occur, New Zealanders are unlikely to be willing to take early measures.

The only course of action that New Zealanders overall are likely to support would be action that is necessary for New Zealand as a member of the international community. That is why the timing of any material action by New Zealand should depend on the timing of action by the countries in the world that are large enough together to really make a difference. It is still too early to predict with any confidence if this will occur. New Zealand should await the outcome of the Copenhagen Conference and final Australian decisions before making its own plans.

**Concluding comments**

The foundation for good regulatory policy is a thoroughgoing analysis of the issues and available options. Much time is being wasted because officials have not been required to present politicians with such an analysis. Politicians thereby lack a sound basis for evaluating options and reaching decisions. Flawed analysis and idiosyncratic rushed decisions lay behind the previous Government's ratification of Kyoto and its promotion of the fundamentally flawed existing ETS legislation.

This is a big issue for New Zealand and unless we get it right, New Zealand's chances of achieving income parity with Australia by 2025 will likely disappear. ACT's strongest recommendation is that the Government insist on a sound regulatory analysis by officials.

ACT disagrees with many particular aspects of the majority report. In particular, it considers:

- It is wrong to treat the IPCC as an impartial authority. Its flaws have been documented by reputable inquiries and no entity has a monopoly on wisdom.
- The proposition that IPCC's worst-case scenarios are being realised seems to be inconsistent with the lack of warming in the current decade to date, while emissions have grown strongly.

- The statement that it is generally accepted by the global community that likely global warming affects would be “unacceptable” even if global emissions peak before 2015 and fall almost to zero by 2100 appears to rest on a blind belief that the few who control the IPCC constitute the global community. In fact it is voters not scientists who will determine what costs are acceptable and the IPCC does not speak for the 30,000 who signed the above petition. The majority’s claim that the IPCC assessments reflect a consensus is untenable.
- Uncertainty can be a valid reason to delay action, particularly when waiting can produce future information and new technologies might reduce the cost of action. Regardless, actions need to be justified on the basis that likely benefits from action exceed the costs.
- It is wrong to argue that a carbon tax approach cannot allow foresters to manage price risks over time. A carbon tax on emissions would be combined with a carbon subsidy for (genuine) absorption.
- It is premature in assuming that the rest of the world will move to emissions trading when the EU experience with it has been so unsatisfactory. Other countries trying to put one in place are struggling with the difficulties, some other countries are taking a different approach, and the weight of expert economic opinion seems to favour a carbon tax.
- It is also premature to propose that the critical objective for New Zealand’s mitigation decision should be to prepare for the continued existence of a carbon-constrained world. As our analysis above has shown, the only plausible benefit for New Zealanders from mitigation currently is that it might induce others to look more favourably on New Zealand.
- The finding that a mix of mitigation policies “will be necessary” for New Zealand illustrates the ill-justified calls for action that can be expected from the lack of a proper regulatory analysis of the issues. The majority report makes no case that other countries will look more favourably on New Zealand if we inflict a range of distorting ad hoc measures on the New Zealand economy. Officials must be required to make best-endeavours estimates of these postulated benefits.
- We agree that New Zealand should be seen to be willing to play a part in any fully international effort to reduce global emissions. A low-rate carbon tax and subsidy scheme is a more appropriate initial step, with any advance from there dependent on the advance of scientific knowledge and on a fully international effort to reduce.

### **Māori Party minority view**

The Māori Party commends the Emissions Trading Scheme Review Committee for their work in bringing together and drawing out key issues and concerns to be considered by the Government in developing an ETS to assist New Zealand in meeting current and future emission reduction targets.

We particularly commend the committee for the commentary on the impacts of an ETS on iwi and Māori households. The principles contained in chapter 9 are significant, and any final decisions on the design of an ETS will need to reflect them—alongside the recommendation for iwi to be directly engaged in policy design and implementation. These principles or provision for how they are to be reflected in an ETS will need to be included in any new legislation to ensure that the development of Māori businesses can be appropriately supported. Such protections are a just response to the reality of developing Māori businesses in a developed market, a reality that is due to historical breaches of the Treaty of Waitangi. The Māori Party also supports the view that more consideration should be given to incentivising the maintenance and planting of indigenous forests.

During the debate on the Climate Change (Emissions Trading and Renewable Preference) Bill, the Māori Party raised concerns over the introduction of an ETS. Opposition to the bill was both generalised and specific. At a fundamental level, there was opposition to an ETS which allows sectors to pollute and trade up to the Kyoto target, but which does not include incremental emission reduction targets in its design. With the emphasis on trading—establishing and maintaining the conditions for it—the overarching problem of unsustainable economic growth remains unaddressed. More specifically, we opposed the bill because of its relative ineffectiveness and inequalities, including the subsidisation of the nation's largest polluters at the cost of households and small-medium businesses.

The Māori Party continues to oppose the introduction of an ETS on these grounds, and would do so more strongly if a replacement scheme were to be less effective and more inequitable.

While the report notes the significance of climate change and the urgent need to respond, we do not agree that an ETS will make a sufficient contribution to lowering our domestic emissions. We remain unconvinced that the market is the best mechanism to set a price on carbon. The continued rise in oil costs from pending peak oil production and global shortages of fresh water alert us to the fact that the world's economy is not so much in a temporary recession as in a state of major change, and that the current mode of living in developed countries is simply not sustainable into the future.

Market forces will continue to be unpredictable and mitigating measures such as price caps and price protections may be demanded and agreed to for longer than merely transition periods. The urgency of the climate-change crisis demands the development and implementation of an effective scheme that is not reliant on whether or when the price of carbon increases to a sufficient level to incentivise change.

We also remain deeply concerned about protections in the form of intensity-based allocations and subsidies, which again distort the market model by allowing protected businesses to increase their emissions without penalty, and to be rewarded for it.

For this reason the Māori Party continues to support the introduction of a carbon tax regime as the best mechanism to introduce a price on carbon. A carbon tax is a simpler regime, which provides certainty on price, and as the report notes, it is more stringent than an ETS when set at a sufficiently high rate, and applied to all sectors—incentivising polluters to change without the option of trading their way out and continuing with business-as-usual. Tax revenue could be reinvested for sector-wide research and further policy development, and to provide assistance to households and communities vulnerable to increased living costs arising from the scheme, and the health and environmental effects of global warming.

Significantly, the nation urgently needs to grapple with the notion of sustainability and the increasing challenge posed by a changing climate system and pending peak oil to think and live differently; to live sustainably. We are pleased to note the recommendations included in chapter 10 on complementary measures, and particularly the recognition that an ETS is but one possible tool to address climate change, and that more is required. However, the Māori Party remains deeply concerned that an ETS remains a stand-in for a more comprehensive climate change policy, and that complementary measures rely on the notion that scientific and technological innovation is capable of manipulating the environment to enable the nation to continue as we are. The resources of Papatuanuku are finite.

The Māori Party strongly believes that more needs to be done. Instead of relying on carbon sinks from forestry or buying credits on the international market to achieve our targets, we need to be focused on decreasing domestic emissions. A commitment to prioritise emission reduction will best serve the climate system and protect New Zealand businesses and taxpayers from market uncertainties.

We take seriously the kaupapa of the Māori Party—rangatiratanga, kaitiakitanga, kotahitanga—and urge the Government to develop a wide-ranging sustainability framework in which to consider policy development on climate change, renewable energy, transport, roading, industry, employment and so on, to best ensure our collective future well being. Current and future Kyoto targets are a minimum response to addressing climate change

## Appendix A

### Committee procedure

The Emissions Trading Scheme Review Committee was established in December 2008 as a special committee by the House to carry out a review of the New Zealand Emissions Trading Scheme. We met between 18 December 2008 and 20 August 2009 to conduct the review.

We called for public submissions on the review. The closing date for submissions was 27 February 2009. We received 282 submissions from the organisations and individuals listed in Appendix C and heard 95 oral submissions.

We received advice from the Emissions Trading Group from within the Ministry for the Environment, from the Ministry of Agriculture and Forestry, and the Ministry of Foreign Affairs and Trade. We also received advice from the Parliamentary Commissioner for the Environment.

Recognising that the review would deal in considerable depth with aspects of climate change policy, which would affect sectors of New Zealand society significantly and in different ways, three independent specialist advisers—Stuart Frazer (Frazer Lindstrom Limited), Julia Hoare (PricewaterhouseCoopers), and Chris Karamea Insley (37 degrees South) were engaged.

### Committee members

Hon Peter Dunne (Chairperson)  
Charles Chauvel  
Jeanette Fitzsimons  
Craig Foss (Deputy Chairperson)  
Hon Rodney Hide  
Dr Paul Hutchison  
Rahui Katene  
Moana Mackey  
Hekia Parata  
Hon David Parker  
Nicky Wagner

## Appendix B

### Glossary and abbreviations

**Annex I Party** A developed country or economy in transition listed in Annex I of the United Nations Framework Convention on Climate Change. Annex I Parties would have also signed and ratified the Kyoto Protocol, including New Zealand and would have assumed binding quantified targets to reduce or limit their net emissions during the first Kyoto commitment period from 2008 to 2012.

**Assigned amount units** The emission units allocated to the Annex I countries under the Kyoto Protocol on the basis of their quantified emission target for the first commitment period, 2008 to 2012. One unit is equal to one tonne of carbon dioxide equivalent.

**Carbon dioxide equivalent** The quantity of a given greenhouse gas multiplied by its global warming potential, which equates its global warming impact relative to carbon dioxide. This is the standard unit for comparing the degree of warming that can be caused by emissions of different greenhouse gases.

**Carbon market** A shorthand term for an international or domestic market where greenhouse gas emission units are exchanged between buyers and sellers. The terms “carbon market,” “greenhouse gas market” and “emissions market” can be used interchangeably.

**Carbon tax** A tax applied to CO<sub>2</sub>-equivalent emissions. The New Zealand Government’s 2002 climate change policy package included a carbon tax on energy, industrial and transport emissions, capped at \$25 per tonne of carbon dioxide equivalent. In December 2005, the New Zealand Government decided not to proceed with the announced carbon tax.

**Clean Development Mechanism** A Kyoto Protocol mechanism that allows emission reduction and afforestation and reforestation projects with sustainable development benefits to be implemented in developing countries that have ratified the Kyoto Protocol. These projects earn particular Kyoto units, which can be used by Annex I parties to help meet their Kyoto commitment.

**Commitment period** A range of years where parties to the Kyoto Protocol are required to meet their quantified emissions limitation, or reduction commitment. The first commitment period is 2008 to 2012.

**Competitiveness at risk** The position where bearing a price for emissions significantly impedes a firm’s ability to compete against international competitors in countries with less stringent climate change policies. Such competition could be based on exports or imports.

**De minimus emissions** are either non-material or sufficiently small (relative to monitoring costs etc) so that it is not worthwhile for them to be included in the Emissions Trading Scheme.

**Economic leakage** Economic activity being displaced from one country to another, with a consequent reduction in economic welfare in the former country.

**Emission factor** An intensity factor relating emissions per unit of activity (such as tonnes of fuel consumed, tonnes of product produced).

**Emissions unit** An instrument created under law that can be bought and sold and used to meet an entity's obligations under an emission-trading scheme. In the NZ ETS, one emissions unit corresponds to one metric tonne of carbon dioxide equivalent emissions.

**Emissions** The release of greenhouse gases into the atmosphere.

**Emissions (or environmental) leakage** The shift in emissions (and other environmental impacts) from one country to another associated with economic activity being displaced from one country to another.

**Exemption** A waiver given to a firm from bearing an obligation under a policy measure; for example, under the former carbon tax and Negotiated Greenhouse Agreement regime, such firms were to receive a full or partial exemption from the carbon tax that would otherwise have applied to their direct emissions of greenhouse gases.

**Fossil fuel** Coal, natural gas, crude oil, and fuels derived from crude oil such as petrol and diesel. They are called fossil fuels because they have been formed over long periods from ancient organic matter. They are not renewable.

**Fugitive emissions** Emissions arising as a result of processing or transforming fuels. Examples of fugitive emissions include the venting of CO<sub>2</sub> at the Kapuni Gas Treatment Plant and emissions from geothermal fields.

**Global warming potential** A factor indicating the radiative forcing impact (amount of warming) of one unit of a given greenhouse gas relative to one unit of CO<sub>2</sub>. For example, under the Kyoto Protocol, the global warming potential of methane is 21 and the potential of nitrous oxide is 310.

**Grandparenting** The allocation of emission units or other forms of financial assistance to emitters on the basis of their historical emissions.

**Greenhouse gas** A constituent of the atmosphere, natural or anthropogenic, that absorbs and re-emit infrared radiation. Emissions covered by the emissions limitation or reduction commitment for the first commitment period of the Kyoto Protocol are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.

**Grey market** In the New Zealand context, a shorthand term for the emissions trading market for units that cannot be used for compliance with the Kyoto Protocol. Grey market units can be generated by projects in Kyoto countries that do not pass through the Kyoto Protocol's crediting processes, or in countries that have not ratified the Kyoto Protocol.

**Inventory** A list of an organisation's or a country's emissions by sources, removals by sinks (for example, growing trees) and stocks (for example, carbon stored in forest biomass and soils).

**Joint Implementation** A mechanism that allows emission reduction and removal projects to be implemented in Annex I parties that have ratified the Kyoto Protocol. Joint implementation projects earn particular Kyoto compliance units known as emission reduction units, which can be used by an Annex I party to help meet its Kyoto commitment.

**Kyoto market** The emissions trading market for emissions units included under the Kyoto Protocol.

**Kyoto Protocol** A protocol to the United Nations Framework Convention on Climate Change that includes emissions limitation or reduction commitments for ratifying countries listed in its Annex B (developed countries and Economies in Transition).

**Mitigation** Any action that results, by design, in the reduction of emissions by sources, or enhances removals by sinks. Mitigation and abatement are often used as equivalent terms.

**National inventory** A quantitative report of the anthropogenic emissions, by sources, removals by sinks, and stocks of greenhouse gases not controlled by the Montreal Protocol.

**Negotiated Greenhouse Agreements** Under the New Zealand Government's 2002 climate change policy package, agreements available to eligible firms whose international competitiveness would be placed at risk by the carbon tax. Eligible firms were to receive full or partial relief from the carbon tax in return for moving toward world's best practice in emissions management. In December 2005, the New Zealand Government decided not proceed with the carbon tax or negotiated greenhouse agreements.

**New Zealand Emission Unit Registry** The registry established for the purposes set out in section 10 of the Climate Change Response Act 2002.

**Pass-through** The increase in the consumer price of a product resulting from the imposition on the producer or supplier of a price for the product's emissions.

**Price-based measures** Also called "economic instruments" and "market instruments". Price-based measures can be applied to integrate the costs (or opportunity costs) of emissions into decision-making in the marketplace.

**Price of carbon** In the New Zealand context, a shorthand term for the price of emissions in a trading market, typically calculated in dollars per tonne of carbon dioxide equivalent.

**Progressive obligation** An obligation for an emission trading scheme participant to surrender units representing some percentage of the full obligation during a transitional period. For example, under a 50 percent obligation, a participant would surrender one emission unit for every two tonnes of emissions. A progressive obligation could increase over time until it became a full obligation to surrender one unit for each tonne of emissions.

**Rebate** An amount intended to refund the cost of a policy measure. For example, under the former carbon tax and negotiated greenhouse agreements regime, rebates were

available to firms to compensate them for increased electricity prices resulting from the carbon tax applied to fossil fuels.

**Relief exemptions** Rebates designed to offset the cost of a policy measure, such as a tax or other charge.

**Retirement (of Kyoto units)** Under the Kyoto Protocol, the transfer of a Kyoto unit from an Annex B party's holding account in its national emission unit register into a retirement account for the purpose of compliance with its quantified emission reduction or limitation commitment. Once a Kyoto unit has been retired in a commitment period, it cannot be traded or used in future commitment periods.

**Revenue recycling** The return to the economy of revenue derived from a policy measure.

**Sequestration** The uptake and storage of carbon. Carbon can be sequestered by plants and soil and in underground and deep sea reservoirs. (Underground storage is also called geological sequestration.)

**Sink** Something such as growing forest or soil, that actively removes a greenhouse gas from the atmosphere. A sink is distinct from a reservoir where greenhouse gases can be stored, such as an underground reservoir or a mature forest.

**Surrender** The transfer of a New Zealand unit, Kyoto unit, or other overseas unit (if applicable) from an individual account to the New Zealand Government's surrender account in the Registry for the purpose of compliance with a surrender obligation. Surrendering a unit will render it incapable of being further transferred, retired, or cancelled in the absence of a direction from the Minister of Finance. Once a Kyoto unit has been transferred to the Government's surrender account, it may retire it for compliance under the Kyoto Protocol.

**Threshold criteria** Attributes that define those firms, sites, or other business units that are required to participate in a policy measure. The United Nations Framework Convention on Climate Change is an international treaty on climate change that came into force in 1992. It aims to stabilise greenhouse gas concentrations at a level that avoids dangerous human interference with the climate system.

## Abbreviations

<b>AAUs</b>	Assigned Amount Units
<b>ABARE</b>	Australian Bureau of Agricultural and Resource Economics
<b>AGS</b>	Afforestation Grant Scheme
<b>avgas</b>	aviation gasoline
<b>CAR</b>	Competitiveness at risk
<b>CCRA</b>	Climate Change Response Act 2002
<b>CDM</b>	Clean Development Mechanism
<b>CERs</b>	Certified Emission Reductions
<b>CH<sub>4</sub></b>	Methane
<b>CNG</b>	Compressed Natural Gas
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>CO<sub>2</sub>-e</b>	Carbon dioxide equivalent
<b>ERUs</b>	Emission Reduction Units
<b>ETS</b>	Emissions Trading Scheme
<b>EU</b>	European Union
<b>EU ETS</b>	European Union Emissions Trading Scheme
<b>GDP</b>	Gross Domestic Product
<b>HFCs</b>	Hydrofluorocarbons
<b>IEA</b>	International Energy Agency
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>JI</b>	Joint Implementation
<b>LPG</b>	Liquefied Petroleum Gas
<b>MAF</b>	Ministry of Agriculture and Forestry
<b>MED</b>	Ministry of Economic Development
<b>NES</b>	National Environmental Standard
<b>NGA</b>	Negotiated Greenhouse Agreement
<b>NZ ETS</b>	New Zealand Emissions Trading Scheme
<b>NZEECS</b>	New Zealand Energy Efficiency and Conservation Strategy
<b>NZES</b>	New Zealand Energy Strategy
<b>NZU</b>	New Zealand Unit
<b>PFCs</b>	Perfluorocarbons
<b>RMUs</b>	Removal Units
<b>SF<sub>6</sub></b>	Sulphur hexafluoride
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change

## Appendix C

### Evidence, advice, and references

#### Evidence: List of submitters

1, 1A	Vincent Gray
2	Nigel Sutton
3	Australasian Compliance Institute
4, 4A	Global NRG Limited
5, 5A	John Adams
6	John Clements
7	Steve Wrathall
8, 8A	Max Hill
9	Dr J van der Lingen
10, 10A	M Nichols
11	G D Taylor
12	New Zealand Institute of Economic Research
13	Pike River Coal Limited
14	T G Brown
15	Carbon Farming Group
16	John Blundell
17, 17A	Holcim (New Zealand) Limited
18	Sustainable Dunedin City Incorporated
19	J B Cooke
20	R G Ward
21	K W Wilson
22	J W Eyton
23	Alan Sutherland
24, 24A	Neil Henderson
25	D G Dennis
26	John Purey-Cust
27	New Zealand Pork Industry Board
28	J G Rawson
29, 29A	Talley's Group Limited
30, 30A	Sanford Limited
31	Dean Satchell
32	James Barber
33	D W Beatty
34	M C Bint
35	Taranaki-King Country Electorate Subcommittee, New Zealand National Party
36, 36A-C	Dr R M Carter
37	Dr M Miskolczi
38	M Mills
39	J Finney
40	Winston Marsh

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41, 41A	Manfred Dedekind
42, 42A	Miklos Zagoni
43, 43A-B	Dr John Maunder
44, 44A	New Zealand Forest Owners Association Incorporated
45, 45A	Methanex New Zealand Limited
46	M L Matthews
47, 47A	John McLean
48	Otago Waste Services
49	PGG Wrightson Limited
50	T J Dunleavy
51	Perry Group Limited
52	Bera MacClement
53	David MacClement
54	Craige Mackenzie
55	Indigo Limited
56	J M T Greene
57	Bryan Walker
58, 58A-J	Graeme Howard
59	Mangatu Blocks Incorporation and Wi Pere Trust
60	Andrew Stuart Holdings Group
61	Kathleen Ryan-McCabe and Dr Bruce McCabe
62	SCA Hygiene Australasia Limited
63	Rio Tinto Alcan New Zealand
64, 64A	Temperzone Limited
65	Transwaste Canterbury Limited
66, 66A	Dr Peter Read
67	Robin Grieve
68, 68A-C	The New Zealand Climate Science Coalition
69	Forest Enterprises Limited
70	The Carbon Sense Coalition
71	Auckland Regional Public Health Service
72, 72A	Environmental Intermediaries and Trading Group Limited
73	G B Gleeson
74	MC and AE Ward
75	GreenAir Limited
76	Susan Skarsholt
77, 77A	Gareth Renowden
78, 78A	Noel Harvey-Webb
79	Morgan Davie
80	John Balance
81	P J Fleming
82	New Zealand Centre for Political Research
83	Taranaki Energy Watch
84	Peter Manson
85	Robyn Williamson
86	Pan Pac Forest Products Limited
87, 87A-C	Meridian Energy Limited
88	Atihau-Whanganui Incorporated

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89	Motor Trade Association
90, 90A-B	John Blakeley
91, 91A	BallanceAgri-Nutrients Limited
92	Solutions-Multipliers New Zealand Limited
93	New Zealand Automobile Association
94, 94A	Kyoto Forestry Association
95, 95A-D	Centre for Resource Management Studies
96	D T S Riddiford
97	Mobil Oil New Zealand Limited
98, 98A	DairyNZ
99, 99A	The New Zealand Refining Company Limited
100	Denis Shuker
101	S D Payne
102	B W Walker
103, 103A-B	Queen Charlotte Wilderness Park
104, 104A-B	Shell New Zealand Limited
105	Racewell
106	Murray Lane
107	Peter Wilks
108	The Green Climate Club Incorporated
109	Carbon Market Solutions
110	Vector Limited
111, 111A	Students of Waihi College Farm Unit
112, 112A-G	J B Liley
113	Waipari Station
114	Murumuru Farms
115, 115A-E	Dr Kesten Green
116	Dave McArthur
117	Airshed Limited
118	R K Stent
119	Local Government New Zealand
120	Standards New Zealand
121, 121A	Westpac New Zealand Limited
122	Catalyst R and D Limited
123	GNS Science
124	Carbonscape
125	M E Rollinson
126	TZ1 Limited
127	Wood Processors Association of New Zealand
128, 128A	New Zealand Institute of Forestry
129	Brian O'Neill
130	Farmers of New Zealand Incorporated
131	The Kiwi Party
132, 132A	Genesis Energy
133	South Waikato District Council
134, 134A-C	New Zealand Business Council for Sustainable Development
135	R M Blackstock
136	E M Jenkins

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137	Herb Familton
138	Paul Stichbury
139	G and D Matthews Limited
140	D C Bull
141	Waitakere Ranges Protection Society Incorporated
142	Edwyn Kight
143	Jim Cotman
144	New Zealand International Union for the Conservation of Nature and National Resources (IUCN) Committee
145	P N Baker
146	R C Howard
147	Institute for Private Enterprise
148	Environmental Defence Society Incorporated
149	Carbon Capital Partners
150	Kapiti Coast District Council
151	Neil Walker
152, 152A	Southern Cross Horticulture Limited
153	Fletcher Building Limited
154	Merv Rusk
155, 155A	New Zealand Business Roundtable
156, 156A-B	Scion (New Zealand Forest Research Institute Limited)
157	Certified Builders Association of New Zealand Incorporated
158	Ngati Porou Forests Limited
159, 159A-E	The Pacific Institute of Resource Management
160	R A Scampton
161, 161A	Bill Sayer
162, 162A	Federation of Māori Authorities
163	Murray Ellis
164	Fivepower Systems Limited
165	Tatua Co-operative Dairy Company Limited
166	Aviation Industry Association of New Zealand
167	Landcorp Farming Limited
168, 168A	Envirowaste Services Limited
169	Landfill and Residual Waste Sector Group (Waster Management Institute of New Zealand Incorporated)
170	McDonald's Lime Limited and Taylor's Lime
171	Midwest Disposals Limited
172	Stuart Orme
173	Gerizim Group Holdings Wellington New Zealand Limited
174	Mike Jowsey
175, 175A	Business New Zealand
176	Air New Zealand Limited
177	Libertarianz Party
178	OMV New Zealand Limited
179	Oxfam New Zealand
180	Climate Defence Network
181	BP Oil New Zealand Limited
182	New Zealand Kiwifruit Growers Incorporated

183, 183A-E	Fonterra Co-operative Group Limited
184	Dairy Companies Association of New Zealand
185	Southern Forests New Zealand Limited and Carbon Solutions New Zealand Limited
186	Te Ohu Kaimoana Trustee Limited, Aotearoa Fisheries Limited, Sealord Group Limited, and Endurance Fishing Limited
187	Westland Milk Products
188, 188A	Solid Energy New Zealand Limited
189	Wellington City Council
190	New Zealand Parliamentarians' Group on Population and Development
191	New Zealand Climate Change Centre
192	Pastoral Greenhouse Gas Research Consortium
193	New Zealand Members of the Australasian Mayors Council for Climate Protection (AMCCP–NZ)
194, 194A	Environment and Conservation Organisations of New Zealand Incorporated
195	Te Arai Coastal Lands Trust Limited
196	Waikato Raupahi Trustee Company Limited
197	O-I New Zealand
198, 198A-B	Federated Farmers of New Zealand
199, 199A	Contact Energy Limited and Origin Energy Limited
200	Stevenson Group Limited
201, 201A	Waste Management Division (Transpacific Industries (NZ) Limited and Manukau City Council)
202	Waste Disposal Services
203	Poultry Industry Association of New Zealand
204, 204A	Gull New Zealand Limited
205, 205A	Rank Group Limited and Carter Holt Harvey Limited
206, 206A	New Zealand Farm Forestry Association
207	Lester Sherman
208, 208A	Michael Cambridge
209	Wairakei Pastoral Limited
210	The Centre for Independent Studies
211, 211A	Bryan Leyland
212	New Zealand Fish and Game Council
213	Lake Taupo Protection Trust
214	Coal Association of New Zealand Incorporated
215	Domestic Energy Users' Network
216	Institute of Professional Engineers New Zealand (IPENZ)
217	New Zealand Fertiliser Manufacturers' Research Association Incorporated
218	New Zealand Anglican Church Pension Board
219	Castlepoint Station
220, 220A	Meat and Wool New Zealand Limited and Meat Industry Association Incorporated
221	Hinerangi Station Limited
222	David Marshall
223	Deer Industry New Zealand

224	Meat Industry Association Incorporated
225, 225A-C	Greenhouse Policy Coalition
226	-
227	Employers and Manufacturers Association (Northern) Incorporated
228, 228A-C	Landcare Research
229, 229A-C	Sustainability Council of New Zealand
230, 230A	New Zealand Steel Limited
231	Tourism Industry Association New Zealand
232	Horticulture New Zealand
233	Malcolm Harbrow
234	Moore and Associates
235	National Council of Women of New Zealand
236	Velma Siemonek
237, 237A-C	Climate Change Iwi Leadership Group and Māori Reference Group
238	Solar Action (The New Zealand Renewable Energy Society Incorporated)
239	Taharoa C Block Incorporation
240	New Zealand Climate Change Research Institute
241	350 Aotearoa New Zealand
242	Roa Mining Company Limited
243	Francis Mining Company Limited
244	Beyond Carbon Limited
245	Bus and Coach Association New Zealand Incorporated
246, 246A	Community Energy Action Charitable Trust
247, 247A-B	Ecologic Foundation
248	Matariki Forests
249	Mighty River Power
250	Hugh Riddiford and Simon Young
251	D A Ivory
252	Windflow Technology Limited
253	Bank of New Zealand
254	Todd Energy
255, 255A	Bioenergy Association of New Zealand Incorporated
256, 256A-B	Norske Skog Tasman Limited
257	New Zealand Recreational Canoeing Association
258	Geoff Carmody and Associates
259	Fisher and Paykel Appliances Limited and Skope Industries Limited
260	International Emissions Trading Association Geneva
261	Tairāwhiti Earth Centre
262	C M Ball
263	Chevron New Zealand
264	New Zealand Wind Energy Association
265	Greenpeace New Zealand Incorporated
266	The Reforest Trust
267, 267A	Seafood Industry Council Limited
268	New Zealand Chambers of Commerce and Industry
269, 269A	Petroleum Exploration and Production Association of New Zealand Incorporated

270, 270A-B	Major Electricity Users' Group
271	New Zealand Council of Trade Unions
272	Castalia Strategic Advisors
273	Royal Forest and Bird Protection Society of New Zealand
274	Morikaunui Incorporation
275, 275A	Te Rūnanga o Ngāi Tahu
276	OceanaGold Corporation
277	B E Brill
278	ERS New Zealand Limited
279	David Lloyd
280	Dr S H Schneider
281	Department of Climate Change and Environment and the Treasury, Australian Federal Government
282, 282A	Motu Economic and Public Policy Research.

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