

7 Conclusions

The Government should consider formulating an alternative climate change goal for New Zealand that better manages the risks, opportunities and impacts associated with our net emissions position while engaging with the international community in an attempt to secure broad and balanced participation and action on climate change policy.

Underpinning issues relating to our domestic policy settings going forward is a question of the appropriate mix of price-based measures (e.g. taxes), or regulatory and support-based policies. Broadly speaking, in a situation where New Zealand has binding emissions targets, the more closely a domestic carbon tax approximates the international carbon price, the less rationale there is for additional regulatory or supporting measures in those sectors of the economy subject to the tax.

It is unrealistic in the short-term (CP1) for the Government to introduce a new programme to offset New Zealand's Kyoto liability by subsidising large-scale new forest planting because relatively little carbon would be sequestered during CP1.

Although it is unclear what level of domestic emissions reductions can be achieved in CP1, the level of domestic reductions that can be achieved in a cost-effective manner is likely to be small relative to New Zealand's net emissions position. Given this, New Zealand would be prudent to meet its Kyoto commitment by, partially at least, purchasing some Kyoto-compliant units internationally.

A work programme should be commissioned to determine potential buying strategies for New Zealand that reflect New Zealand's objectives in this area and our risk profile, along with issues of management, timing and price. Given the considerable uncertainty that surrounds the future price of emission units, early agreement by the Government to a buying strategy may prove to very important.

7.1 Introduction

This chapter acts as a summary of the Review report and brings together its key conclusions. In doing so, the chapter focuses on the following:

- a. a discussion of New Zealand's climate change strategic goals
- b. a high-level discussion of different approaches to policy settings, more specifically, price-based mechanisms (PBMs), and regulatory and support-based policies
- c. a discussion of two types of PBMs, carbon taxes and emission trading schemes, and a brief discussion of the Project to Reduce Emissions (PRE) programme, a support-based policy which has been underway for some time
- d. a discussion of issues around the use of PBMs, and regulatory and support-based policies, on a sector-by-sector basis
- e. a summary of high level options for reducing domestic emissions in CP1
- f. a discussion of a possible buying strategy for New Zealand and the factors to be taken into account
- g. a discussion of principles to inform New Zealand's international negotiating position.

7.2 New Zealand's Strategic Climate Change Goals

7.2.1 Preface

Climate change matters to New Zealand for several reasons. New Zealand is vulnerable to the impacts of climate change through its coastline, the strong role of agriculture in its economy, infrastructure, and unique ecosystems. This was an important consideration in framing the Government's climate change policies in 2002. This review has been primarily concerned with presenting the Government with strategic choices around climate change mitigation policies. It has not attempted to undertake any evaluation of the potential costs of climate change adaptation in New Zealand, or of the weight that New Zealand should attach to adaptation strategies in the future. This is an area that will warrant further policy investigation over the next few years.

7.2.2 Where did the Government aim in 2002?

The Government established the following strategic climate change goal in 2002:

“To enable New Zealand to make significant greenhouse gas reductions on business as usual and be set towards a permanent downward path for total gross emissions by 2012.”

The goal was established against the following context:

- a. New Zealand would be a net seller of emission units in the first commitment period of the Kyoto Protocol, with a projected surplus of 55 million units – 17.9% of our Kyoto “Assigned Amount Units”

- b. additional policies would be required before 2008 to prepare the New Zealand economy for the first, and importantly, subsequent commitment periods beyond 2012 (New Zealand Government, 2002a). The key policies that were subsequently initiated included:
- projects to Reduce Emissions (PRE)
 - negotiation of Negotiated Greenhouse Agreements (NGAs) for “at risk” firms
 - joint industry/Government -funded agricultural research.
- c. additional policies would be required after 2008 as an international price of emissions emerged. The key policies are:
- a **carbon tax** that approximates the international carbon price;
 - **application of the NGAs** for “at risk” firms
 - continued **agriculture research**
 - the **forestry and land use policy** as announced (with a key feature being retention by the Government of forest sink credits and liabilities but with a deforestation cap aimed at limiting liability to the government from large-scale deforestation)

If it were maintained, and taken seriously, the strategic goal, as established in 2002, would have pointed New Zealand to adopt relatively ambitious long-term emission reduction policies. However, the emission forecasts at the time did not indicate that such policies would be required for New Zealand to meet its current Kyoto commitments, because of the “windfall” from forest sinks. An ambitious target did serve the purpose of ensuring that New Zealand meets its Kyoto obligations cost-effectively by undertaking domestic abatement as well as using its forest sink credits, and for positioning New Zealand for what were expected to be more stringent emission reduction obligations beyond 2012, provided that the mitigation policies achieved the necessary emission reductions.

New Zealand can meet its commitments under the Kyoto protocol through a combination of the following broad approaches:

- a. by reducing emissions through domestic action
- b. by establishing additional forest sinks to offset emissions
- c. by buying credits through the Kyoto Flexibility mechanisms to offset emissions.

7.2.3 What has changed since 2002?

Some fundamentals have changed

There have been some important contextual changes in underlying levels/ rates of emissions:

- a. underlying emissions growth is higher, and forestry planting rates are lower
- b. compared to initial estimates, less forest can be counted as “Kyoto forests”

The net result of these changes is that it is estimated that New Zealand will be in net deficit of 36.2 Mt CO₂e in the first commitment period.

It is important to note that there is uncertainty around that figure and although our methodology for assessing our net emissions position stands up well to international scrutiny, it will be some time until the uncertainty in our net emissions position is reduced to small levels

It is also worth pointing out that other countries are facing similar Kyoto-related issues.

Some of the key policies announced in 2002 will be less effective in delivering emission reductions than expected:

- **Experience has shown that firms eligible for NGAs are likely to be close to “world best practice” in relation to greenhouse emissions from their operations. This suggests that emission reductions achieved through NGAs may be modest.**
- **Preliminary evaluation of the PRE programme concludes that it is unclear whether the expected CP1 emission reductions resulting from PRE exceed the emission units allocated.**
- **Agricultural industry expectations that agricultural research could lead to a reduction of 20% in agricultural emissions by 2012 appear overly optimistic.**

What does this mean for New Zealand’s capacity to reduce emissions?

It will be more difficult for New Zealand to meet its current Kyoto commitments than was anticipated when current policies were set in 2002. However, the task is manageable, particularly if New Zealand makes use of the Kyoto Flexible Mechanisms to partly meet our Kyoto target.

It is impossible to predict now when New Zealand might be able to achieve a "downward carbon path" or how long such a transition might take. With some confidence, we can predict that in the period to 2012, during which New Zealand will have a binding emissions target, New Zealand emissions will continue to grow. Mitigation actions will be directed at reducing the *rate of growth*. Beyond 2012, the picture is less certain. It would be risky now to assume that "new and easy" emissions reductions will be achievable in the immediate period after 2012. In that case, New Zealand could probably only meet any binding "downwards" emissions targets soon after 2012 by paying for emission reductions in developing countries. However, looking to 2020 and beyond, it is only possible to speculate on the opportunities for significant reductions in emissions.

7.2.4 Consideration of Alternative Strategic Climate Change Objectives

The Government may wish to consider replacing the current strategic goal with multiple objectives that it can use to guide its choice of climate change policies.

A quantitative goal may not be helpful in guiding policy choice in the next 5 – 7 years, but that may not hold in the period beyond the next 15 – 20 years. Over a longer time period, technological change in areas such as agriculture for example, may allow New Zealand to pursue policies that do deliver an emissions profile that does take the country towards a "downward carbon path".

The following considerations are pertinent in considering an appropriate goal that might provide guidance for the development of climate change policy.

- New Zealand is dependent on effective global action to manage the degree of climate change
- it is desirable that New Zealand engage internationally to seek to secure effective global action
- the level of New Zealand's emissions will have little direct impact on the degree to which human-induced climate change occurs
- it is desirable that New Zealand positions itself to promote its national interests in the design of international agreements to address climate change
- there is no international agreement on how to deal with climate change post-2012
- it is important that New Zealand's domestic policies align with whatever future international targets we agree to (if any).

7.2.5 An alternative Climate Change Goal could be established based around the principles of “international engagement” and “policy sustainability”

The Government should consider formulating an alternative climate change goal for New Zealand that better manages the risks, opportunities and impacts associated with our net emissions position while engaging with the international community in an attempt to secure broad and balanced participation and action on climate change policy.

The Government may wish to consider an alternative strategic climate change goal around the following elements:

- a. **New Zealand will engage with the international community** on responses to climate change in an attempt to secure broad and balanced participation and action, in particular by all of the world's major emitters, including both developed and developing countries, to effectively manage the risks from human-induced climate change
- b. **New Zealand will adopt policy measures** to address greenhouse emissions that meet the following criteria:
 - i. policy settings that allow us to demonstrate that we will meet the international commitments we take on – e.g. through a combination of achieving domestic abatement and international emissions trading
 - ii. policy settings that recognise New Zealand's unique national circumstances
 - iii. policy settings are *sustainable, efficient, and flexible* and
 - iv. policy settings that are *compatible with New Zealand objectives in relation to economic growth, social cohesion, and other environmental objectives*.
- c. **New Zealand will manage the risks, opportunities and impacts** arising from the effects of climate change and ensure **adaptation** as smoothly as possible.

7.3 Policy Choice - Price-Based Mechanisms (PBMs), Regulation and Support Policies

A critical decision going forward relates to the balance that New Zealand places on price-based mechanisms (PBMs), and regulation and support-based policies (i.e. specific subsidies).

The key difference between the different approaches is that under a PBM, there is no attempt to centrally determine the areas in the economy in which New Zealand is best placed to reduce its domestic emissions.

The use of regulatory mechanisms, or support-based policies relies on a central determination of areas upon which to focus climate change mitigation efforts. In contrast, the use of a PBM allows private firms and individuals to determine the most

appropriate responses throughout the economy in response to the relative change in prices that is implicit.

Broadly applied PBMs are likely to result in changes across a whole range of economic activities. This may lead to:

- a. a large number of small changes in behaviour over time, many of which are imperceptible:
 - these changes in behaviour are likely to occur right throughout the value chain
 - there will be a strong signal that the price of carbon will be faced by all emitters (or all emitters within scope) going into the future thus providing an incentive to seek carbon-reducing activities and technologies where the benefits to the firm concerned outweigh the cost.
- b. structural change where some firms or industries become uncompetitive as a result of the need to face a price of carbon.

Regulatory or support-based mechanisms have the capacity to affect a small number of areas of the economy quite significantly. These types of mechanisms can be used to create large changes in the economy in the areas that are highlighted. One downside is that the costs of these interventions are often unclear. This can make it difficult to confidently determine whether the benefits of the intervention will outweigh the costs. Another downside is that regulatory or support-based policies can result in uneven incentives and behaviours across the economy (Of course, a poorly designed PBM can also have this downside).

An issue for New Zealand to balance going forward is the appropriate mix of these different types of mechanisms. As a general rule, the more that PBMs are employed (and the closer that a PBM is to the world carbon price), the less reason there is for employing either regulatory or support-based mechanisms in the sectors that are subject to a PBM. Therefore it would still be rational to have a PBM across a wide subset of the economy, and to use a regulatory approach in areas where it was not efficient, or practical to impose a PBM.

PBMs, regulatory approaches, and support-based policies all impose costs on the economy. Similarly, a policy mix that relied on not implementing any measures to reduce our domestic emissions would impose a cost on the economy – through the use of taxpayer funding to purchase Kyoto-compliant units internationally. The respective costs are likely to fall on different areas of the economy and are often difficult to determine. The challenge therefore, in determining the most appropriate policy package going forward, is to meet our Kyoto commitments (and position New Zealand as well as possible for going forward beyond CP1) while minimising both the social and economic costs to New Zealand.

The sections below discuss the two types of PBMs that are most commonly employed; carbon taxes and emission trading schemes. There is also a brief discussion of *Project to Reduce Emissions (PRE)*, a support-based policy which has been underway for some time.

Following this, **Section 7.5** examines the use of PBMs, and regulatory and support-based policies, on a sector-by-sector basis. One focus of this section is on discussing options that have the potential to reduce domestic emissions in CP1.

Underpinning issues relating to our domestic policy settings going forward is a question of the appropriate mix of price-based measures, such as taxes, or regulatory and support-based policies. Broadly speaking, in a situation where New Zealand has binding emissions targets, the more closely a domestic carbon tax approximates the international carbon price, the less rationale there is for additional regulatory or supporting measures in those sectors of the economy that are subject to the tax.

7.4 Carbon Taxes and Emissions Trading

7.4.1 Assessment of the Carbon Tax as Announced by the Government

The exemptions to the carbon tax that are applied to the agricultural sector and NGA firms create unequal incentives across the economy to reduce emissions and are therefore a significant source of inefficiency. If maintained, the current policy will not allow New Zealand to achieve long-term abatement at the lowest possible cost to the economy.

The carbon tax as announced might be used as a basis to move to an alternative price-based measure in the future. This could, however, be difficult. Once the tax has been enacted and implemented it would seem unlikely that a *fundamentally different* regime would replace it for some time.

If the Government wishes to introduce a price-based measure to address New Zealand's emissions, it would be preferable for an effective and sustainable regime to be established soon, rather than to persevere with the announced carbon tax and associated NGAs.

Alternatively, the Government could defer a decision until (probably) 2010, taking an explicit decision to meet New Zealand's immediate Kyoto commitments without using a carbon tax.

Alternative carbon tax options are presented in Section 7.4.2.

7.4.2 Alternative Carbon Tax Options

The Review identified a variety of alternative models for progressing the concept of a carbon tax. These are:

Option 1a: A low-level broad-based tax, implemented in the near future, gradually increased over time

Option 1b: A broad-based tax at world price, with targeted recycling of tax revenue (e.g. energy efficiency, structural adjustment)

Option 2a: A deferral of any decision on a price based measure

Option 2b: A tax on large industrial emitters that do not meet (i.e. are worse than) world best practice emissions intensity

A tabular evaluation of these is set out below, followed by a brief discussion of this evaluation.

The Review assessed these alternative models against the following criteria:

- forecast effect on domestic emissions in CP1
- potential impact on domestic emissions beyond 2012.
- economic impacts.
- sustainability, flexibility and feasibility.

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Schematic Comparison of Carbon Tax Models against Assessment Criteria

KEY

✓ Positive impact on emission reduction goal, or growth, or sustainability

X Negative or negligible impact

? Unknown impact

	Effect on domestic emissions in CP1	Effect on domestic emissions beyond CP1	Impacts on medium term economic growth	Sustainability, flexibility and feasibility
Announced carbon tax	✓ 13 Mt reduction	? Depends on whether policy survives "overheads" of negotiating NGAs	X Negligible	X Large overheads of NGAs means sustainability questionable
Option 1a: low-level broad-based tax, rising over time	X Negligible in CP1	✓✓✓ (With agriculture in.) ✓✓ (With agriculture out.) Potentially substantial to 2020 (Depends on the level to which the tax can be raised)	?	✓✓ Provided community buy-in
Option 1b: broad-based tax at world price, targeted recycling	✓✓	? Depends on the nature of the targeted assistance	?	? This option would face major sustainability barriers – fiscal pressures
Option 2a: defer decision on primary price based measure	X	X	X This option would create substantial regulatory uncertainty.	X Unlikely to be sustainable to 2020
Option 2b: tax on large industrial emitters that do not meet world best practice emissions intensity	X Negligible emission reductions	X	X This option would create substantial regulatory uncertainty	X Unlikely to be sustainable to 2020

The difference between **Option 1a** and **Option 1b** is effectively timing and transition to a state where the “world price” of carbon is reflected in domestic policy settings (Option 1a allows for a more staged and gradual adjustment than Option 1b). This report argues that such an approach, with few or zero exceptions, would be most likely to result in an appropriate resource mix from a carbon viewpoint in the longer term, and would be most likely to lead to significant reductions in domestic emissions in the longer term.

Important to note though is that it is very possible that the technical and administrative issues involved in getting to this point will not be easily (or quickly) overcome. In particular, measurement issues face the application of a carbon tax to agriculture; these imply that the use of proxies would be necessary in the short to medium term. In terms of forestry, issues relating to deforestation would still need to be overcome.

Either **Option 1a** or **Option 1b** would be far more suited to remain in place for a significant period of time than either **Option 2a** or **Option 2b**. **Option 1a** or **Option 1b** would provide an important signal to all sectors of the economy that the price of carbon is a genuine issue that New Zealand faces, and that the price of carbon will be reflected in domestic policy settings in the future. As such, firms would have an incentive to invest in technologies that would reduce the emissions intensity of production and consumption.

7.4.3 A New Zealand Emissions Trading Scheme

A New Zealand emissions trading scheme could be considered as an alternative to the carbon tax.

An **emissions trading scheme** (ETS) is potentially a very powerful policy instrument.¹⁴⁶ An ETS could lead to innovative ways of meeting climate change objectives that would otherwise be very difficult, if not impossible, to achieve. For an ETS to be effective, there are a number of administrative and transactional issues to overcome. These include:

- a. being able to accurately measure emissions performance (e.g. at the farm level) and tie individual businesses' obligations to New Zealand's overall obligation
- b. ensuring that scheme participants are accountable for their emissions
- c. ensuring that emission permits are easily tradable, with no excessive transaction costs.

For an ETS to be effective, there would need to be an acceptance that it is here to stay, at least for CP1 but preferably longer. Given this, consistency of policy settings is important, as is a high-level of buy-in, both politically and within the economy. The difficulty of design, and time required for the design, of an ETS implies that, ideally, an ETS would be used for more than one commitment period.

¹⁴⁶ An ETS requires all emitters within the scope of the scheme to hold (and then surrender to the Government) a tradable permit to cover their emissions. The permits have a market value; this allows the lowest cost emission reductions to be identified.

It would be preferable to include as many New Zealand emitters and major greenhouse gases in a New Zealand ETS as possible. There are difficulties associated with including agriculture and forestry. It would be more practical to add these sectors to an existing ETS rather than develop a new ETS including agriculture and/or forestry. Also, an ETS would be most effective if it included all types of land-use decisions that have significant climate change implications, such as afforestation and deforestation rates, changes in stock numbers (especially cattle), fertiliser application and use of technology.

It is arguable whether there is an effective, and suitable international carbon market for a NZ ETS to link into. A market of this nature is necessary to avoid the highly problematic exercise of setting a limit on total New Zealand emissions. An international emissions market would, ideally, allow New Zealand firms to access low-cost emission permits from overseas at low transaction cost.

The Review recommends that the Government not develop a New Zealand ETS to apply in CP1 – i.e. up to 2012. Depending on the nature of any successor to the Kyoto Protocol, New Zealand should seriously consider developing a NZ ETS, to be introduced after 2012.

It is important that any domestic policies developed in the short term are designed to enable a transition to an ETS.

7.4.4 Projects to Reduce Emissions (PRE)

The key objective of PRE is to reduce New Zealand's emission profile in the 2008 to 2012 period. Enhancing New Zealand's energy security was also identified as a desirable outcome of the first assessment round.

A high proportion of units allocated under PRE went to electricity projects. Modelling as background to the Review suggests that the bulk of New Zealand's additional electricity capacity (apart from one new combined-cycle gas turbine station) is likely to come from renewable sources in the immediate future.

The Review concludes that it is unclear whether the expected CP1 emission reductions resulting from PRE exceed the emission units allocated under PRE.

The Review recommends that PRE not continue in its current form.

If the Government decides to change current policy on the carbon tax (linked to the international price of carbon, capped at \$25 per tonne of CO₂e, starting on 1 April 2007 at \$15 per tonne), firms' expectations of future prices (in particular for fossil fuels and electricity), and their assessment of the financial viability of different electricity generation projects and projects that would reduce emissions, are also likely to change.

The assessment that the bulk of New Zealand's additional electricity capacity (apart from the one CCGT) is likely to come from renewable sources in the immediate future¹⁴⁷ may change too, although current modelling suggests that this is unlikely.

The third round of PRE, which was agreed by Cabinet earlier in 2005, should not proceed.

If the Government wished to pursue the PRE model (this may be appropriate depending on any decisions on the future of the carbon tax), the following questions should be considered:

- **Is the PRE model worth continuing?**
- **If so, what should the scope of any future PRE include? (Any non-electricity project? Any non-energy project?)**
- **How can any future PRE programme fit with other policies such as the carbon tax, or policies arising from the Climate Change Policy Review, in order to avoid “double-incentives”?**
- **[withheld under OIA s9(2)(b)(ii)]**
- **Should units (of uncertain value) be allocated to successful firms or is a cash payment more suitable?**

7.5 Sectoral Analysis

7.5.1 Agriculture

Agricultural emissions account for almost half of New Zealand's total gross emissions. The comparable figure for the European Union is just 10%. The significance of agriculture in our emissions profile reflects our traditional comparative economic advantage in pastoral land-use activities. Cost-effective significant mitigation options are currently limited and are likely to remain so, at least over the next decade.

The Government faces three key decisions to guide further policy development:

- a. does the Government want to move towards price or regulatory measures for agricultural greenhouse gas emissions?
- b.

[withheld under OIA s6(a), s9(2)(g)(i), s9(2)(j)]

¹⁴⁷ Based on modelling by the Ministry of Economic Development.

[withheld under OIA s6(a), s9(2)(g)(i), s9(2)(j)]

- c. does the Government accept that the current approach to research, extension, inventory methodology development and maintenance of scientific capacity is sub-optimal? How does it want to approach future Research and Development arrangements?

Does the Government want to move towards price or regulatory measures for agricultural greenhouse gas emissions ?

A Sector-wide Price-Based Approach

A sector-wide price measure during CP1 would be feasible but not fully efficient – it would need to rely largely on proxies for emissions at the farm level, e.g. a poll tax based on animal species and age. The use of proxies would tend to reduce sector output and change land use to lower-emission regimes, rather than make the production system more efficient (from a carbon viewpoint). In addition, estimates of the economic impacts of a price measure on the sector and its likely structural responses are still subject to considerable uncertainties.

If the Government wishes to explore possibilities for moving towards sector-wide price signals that encourage mitigation, the following actions are recommended:

- **Developing a better understanding of the economic impact and likely mitigation responses, and/or structural adjustment, of the sector, sub-sectors, and regions to different price signals**
- **Testing the long-term practical and environmental sustainability of mitigation technologies, and acceptance by international customers of agricultural products**
- **Developing and deploying monitoring and reporting tools that provide accurate, practical and cost-effective estimates of on-farm greenhouse gas emissions, including technological or farm management mitigation actions**
- **Developing methods and data systems to reflect mitigation actions at farm level in the national greenhouse gas inventory consistent with UNFCCC good-practice requirements.**

Partial Approaches

There are alternatives that could avoid some of the shortcomings of sector-wide emissions taxes. Some of these would allow the Government to send an early signal of its longer-term intention to move towards a sector-wide price measure in agriculture. The main alternatives to a sector-wide price measure are:

- a tax on nitrous oxide emissions associated with the use of nitrogen fertilisers

- regulation of total nitrogen loadings in catchments
- direct financial support for the uptake of mitigation technologies.

The price measures relating to agriculture that appear to be most feasible and practical in providing abatement incentives during CP1 are a tax on nitrogen fertilisers, and/or direct financial support for the uptake of mitigation technologies below the international price of carbon. Other proxies are available but have weaknesses.

The nitrogen tax would cover 7% of agricultural non CO₂ emissions and the net effect on total emissions is likely to be low. These partial options have specific risks and benefits that need further analysis; the Government will have to decide whether it wants to investigate these options further.

[withheld under OIA s6(a), s9(2)(g)(i), s9(2)(j)]

How does the Government want to approach future Research and Development arrangements?

Research into mitigation options, farm extension, and inventory development must continue to underpin climate change policies for agriculture to identify and implement cost-effective and practical mitigation options.

Current research and extension arrangements are considered sub-optimal and should be reconsidered not only in terms of total funding levels, but also with regard to the total coverage of research and sharing of responsibilities between industry and the Government.

It would be desirable to analyse existing arrangements and objectives for any critical gaps in efforts between mitigation research, the need to develop the national greenhouse gas inventory, and the development, extension and uptake of mitigation, monitoring and reporting tools at farm level.

Synergies and trade-offs between policy elements

These decisions and their mode of implementation are not independent from each other. The following links are critical:

- moving towards price signals for agriculture could erode the current joint approach to mitigation research, as well as other voluntary approaches by the industry to environmental management and voluntary reporting of information. Early engagement with the sector would be critical to manage these issues.

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[withheld under OIA s6(a), s9(2)(j)]

[withheld under OIA s6(a), s9(2)(j)]

Links of agriculture with other land uses, particularly forestry

Agriculture is only one of a range of possible land uses. Since the total amount of land available is limited, changing incentives for other land uses will have an indirect effect on land area and total stock numbers in agriculture; this will impact on agricultural greenhouse gas emissions. The key linkages are:

- any price incentives for forestry, in recognition of their role as carbon sinks, would reduce the relative value of land for agricultural purposes. The effect of carbon-sink incentives on overall emissions will be greater than the amount of carbon stored in newly planted trees since it will also replace agricultural emissions.
- other restrictions on land uses and land-use changes under the RMA that can also influence agricultural activities. It is not generally cost-effective to use such regulations specifically to control greenhouse gas

emissions. But where such regulations are undertaken for other purposes, they would also affect emission trends. There may be a need for consistency of RMA decisions in relation to this i.e. in some areas restrictions are placed on forestry planting due to water catchments effects.

Most farmers take a whole-farm perspective on their operations and do not distinguish between forestry and agricultural activities. A sector-wide price measure on agricultural emissions would receive greater support if it allowed offsets of agricultural emissions through the planting of trees. Such a scheme would raise a wide number of issues regarding monitoring, verification, and liabilities associated with carbon sinks.

7.5.2 Energy

The key means of achieving emission reductions in the energy sector is through improvements to energy efficiency (in terms of both technologies and behaviour) and increasing the proportion of renewable energy in New Zealand's energy supply.¹⁴⁸

Analysis suggests there is some potential for further uptake of cost effective energy efficiency measures in the economy. The key to "unlocking" this potential is understanding the nature of impediments or disincentives to adopting such measures, so that appropriate policy responses can be developed and targeted.

New Zealand's electricity system is already low in emissions intensity by world standards. While the contribution of some new renewables (in particular, wind) is projected to increase over the next 10 years, New Zealand's scope for mitigation from fuel switching is more limited than for many other countries. Potential emissions savings still exist through increasing the use of renewable energy in generation of process heat.

A key decision for the Government in the energy sector is whether to proceed with the announced carbon tax or adopt an alternative arrangement (including postponing implementation of any price-based measure).

A price-based measure will be an important mechanism for encouraging renewable generation, as well as fostering demand response through investment in energy efficiency and changes in behaviour. However, a tax focussed solely on the energy sector would have significantly reduced efficiency. If the Government decides not to proceed with a carbon tax, it could consider the benefits of expanding a selection of existing non-price based measures, although decisions on these programmes should wait until EECA's review of the National Energy Efficiency and Conservation Strategy (NEECS) is completed.

Existing regulation and support programmes to reduce emissions are generally more developed in the energy sector than in other sectors. Strong co-benefits (including economic, social, health and environmental benefits) have resulted in the Government

¹⁴⁸ Note that transport energy comprises a significant proportion of overall energy use, although emissions reductions from transport are discussed separately in Section 7.2.5

acknowledging and committing to energy efficiency and renewable energy, establishing EECA in 2000 to specifically focus on pursuing potential benefits.

EECA now has a well-established, although evolving, package of measures. Other regulatory measures also contribute to climate change outcomes in the energy sector, including recognition in the Resource Management Act of the benefits of renewable energy and energy efficiency, low-fixed-charge electricity tariffs and the (pending) regulation of line access for distributed generation.

EECA is currently leading an interdepartmental process to review NEECS. NEECS provides a strategic context for EECA's package of energy efficiency and renewable energy measures. The Energy Efficiency and Conservation Act 2000 requires the NEECS to be reviewed five years after it comes into force and requires the Minister of Energy to determine whether or not the NEECS needs to be replaced by a new strategy. This first stage will involve a stocktake of current NEECS programmes, an assessment of best practice, and an assessment of programme "gaps". Should the Minister decide that a new strategy is to be developed, a more in-depth assessment of options for additional and expanded programmes will be undertaken.

The review of climate change policy has therefore not attempted to provide detailed policy recommendations in the energy sector, although an initial assessment of the climate change costs and benefits of measures has been undertaken. This assessment suggests most current energy sector measures are "no regrets" policies, based on the economic gains they deliver and associated co-benefits.

While EECA's current suite of programmes is broadly well-balanced across the range of appropriate interventions, the ability to achieve more significant gains will depend on facilitating widespread behavioural change. However, due to the tight coupling of energy growth and economic activity, the gross emission benefits from such gains will risk being diluted by population growth and societal change, and economic growth more generally.

EECA already has in place a programme of regulatory-based minimum energy performance standards, which is scheduled to expand both in terms of scope and stringency. Whilst these planned regulations represent good value for money from a fiscal perspective, any additional expansion of the programme would need to consider the possibility of diminishing returns in light of technical potentials, as well as trans-Tasman alignment of standards (an important focus of the current programme). Other programmes in place address information problems (via product labelling, energy audits and education/information provision), capital barriers (subsidies and low cost loans) and split incentives (the current review of the Building Code).

The appropriate nature and breadth of future/additional regulatory and supporting interventions to encourage energy efficiency will be dependent on decisions taken regarding the future shape of any market-based measure (i.e. carbon tax or emissions trading). Broadly speaking, in situations where New Zealand has binding emissions targets, the more closely a domestic carbon tax approximates the international carbon price, the less rationale there is for additional supporting measures (however the need to address barriers to energy efficiency will remain). Whilst there may be a basis for transitional support to help firms adjust to a carbon price, this is offset to the extent that a tax is gradually phased in (the phasing in is, in effect, providing transitional support).

Decisions about energy-efficiency and renewable-energy programmes should only be made after the NEECS review is completed.

7.5.3 Forestry and Land use change

Uncertainty about the Land Use, Land Use Change and Forestry (LULUCF) rules beyond 2012 is a major impediment to developing a resilient domestic policy package in this area. Without certainty on future rules, including targets, definitions, accounting and interpretation, it is difficult to evaluate the benefits and liabilities to New Zealand in the medium-to-longer term. However, it is important to note that the design of domestic climate change policy for land-use change need not necessarily mirror international rules. While New Zealand must adhere to issues related to compliance, domestic policy design has the flexibility to determine how appropriate signals can be transmitted in relation to afforestation, reforestation and deforestation.

Forestry and agriculture compete for land use. For equity and efficiency reasons, it is preferable that climate change policies are land-use sector neutral and do not distort investment decisions. Similarly, substitutes for wood products should also be treated the same as wood products. Continued flexibility in land-use decision-making is desirable.

Forestry can assist New Zealand in the transition towards a more climate-friendly economy. Forest sinks “buy time”. However, any consideration of the benefits of forestry must not be divorced from the liabilities associated with harvesting and deforestation.

In the short term, forest sink credits will offset harvesting and deforestation liabilities. New Zealand’s projection for sinks over CP1 is a surplus of 67.8 Mt CO₂e.

In the medium-to-longer term, the high planting rates of the mid-1990s mean that, at harvest, there is a potential for New Zealand’s net sink position to be in deficit (ie, harvesting liabilities will be greater than the sequestration benefits). This deficit assumes that current Kyoto rules remain very similar over the medium-to-long term and that New Zealand is unable to gain a more favourable agreement (relative to the present agreement) in the future.

A planting programme could potentially dampen or push this deficit out into the future. However, such a programme will only be effective in the longer term if significant areas of pasture are permanently converted back to forest.

Description of Options Considered by the Review

The lack of information and in-depth analysis done to date precludes any recommendation on a preferred policy option for climate change land-use policies. The Review has identified five broad options for consideration by the Government:

- Option One – Government retains all Kyoto benefits and liabilities

- Sub-option 1A - No deforestation cap on non-Kyoto forests, no policies to enhance sinks (e.g, PFSI)
- Sub-option 1B - No deforestation cap on non-Kyoto forests, retain policies to enhance sinks (e.g, PFSI)
- Option Two – Payment for afforestation/reforestation, no devolution of liabilities and no deforestation cap
- Option Three – The current policy, giving effect to the deforestation cap and other policies to encourage new planting
- Option Four - Deforestation charge/afforestation rebate
- Option Five - Devolution of carbon benefits and liabilities.

Of the range of options assessed none is clearly preferred, and all have shortcomings and involve tradeoffs. The most preferred of the options should be investigated urgently to ensure that any policy changes can be implemented prior to CP1.

(See Section 4.4.7 for further analysis.)

Key conclusions of the Review are as follows:

- The current policy package does not send appropriate climate change signals to land managers regarding the benefits and costs of land-use change.
- It is recommended that Option One not be progressed further because, while it would provide greater certainty for forest owners in the absence of the deforestation cap, the lack of signals and bounds on the liability for the Crown means the situation would likely become untenable.

The review highlights some possible avenues to improve the lack of climate change signals to land managers. It is recommended that these findings form the basis of a work programme for further analysis. Those options include:

- Option Two - A payment for afforestation/reforestation and removal of the deforestation cap
- Option Three - The current policy package - clarification of the policy relating to the deforestation cap, additional policies to encourage new planting
- Option Four - Deforestation charge/afforestation rebate
- Option Five - Devolution of carbon benefits and liabilities (in conjunction with work on an Emissions Trading Scheme).

Options Three, Four and Five offer greater certainty and improved signals but are technically complex. They raise considerations related to feasibility, compliance, equity, enforcement and compliance costs.

A pre-condition for the full devolution of sink benefits and liabilities (Option Five) is a fully functioning Emissions Trading Scheme.

A work programme is also required to investigate the consistency of the above options against WTO and other international agreements obligations.

Better information is also required to discern the future deforestation intentions of foresters and to understand the decision-making process of land-use change in New Zealand.

Should Forestry Policy be used to affect New Zealand's CP1 Commitments?

A unique feature of New Zealand is the significance of plantation forestry as a land use. New Zealand's liability under the Kyoto Protocol is vulnerable to changes in land use; specifically, the conversion of forest to other land uses in the period 2008-2012. At the same time, under the Kyoto sink mechanism the afforestation of new areas since 1990 can be credited as sinks to offset emissions during the period of tree growth. However, when the forest is harvested, under the current rules there is a requirement to "pay back" these credits.

This leaves the question as to whether the Government should encourage large-scale forest plantings as part of a specific strategy to offset New Zealand's greenhouse emissions, and so reduce the forecast deficit in the first Kyoto commitment period. Practical and biological factors mean that such an approach will not be effective in reducing emissions over the short term (2008-2012) because new plantings would sequester relatively little carbon over CP1. The primary benefit of such planting would be to offset emissions growth in second and subsequent commitment periods.

It is also not possible at this time to provide precise costings for such an incentive scheme. This is because it is difficult, *ex ante*, to determine the subsidy required to generate a rate of return sufficient to induce the private sector to undertake large-scale new plantings. This would also need to be considered against the cost of the Crown investing directly in afforestation including afforestation/revegetation of Crown land. Any such strategy would need to take into account the full costs and benefits (including co-benefits), and be ranked against the cost of purchasing emissions units on the international market. In some areas the co-benefits are compelling i.e. East Coast hill country erosion.

It is unrealistic in the short-term (CP1) for the Government to introduce a new programme to substantially offset New Zealand's Kyoto liability by subsidising large-scale new forest planting because relatively little carbon would be sequestered during CP1. Such plantings have the potential to provide a benefit for future commitment periods and have the potential to provide significant co-benefits. However, they will also create a liability that will be incurred on harvesting.

7.5.4 Transport

For around the last two decades, New Zealand has experienced a period of low oil prices and/or relatively high economic growth. Transport patterns have been heavily reinforced by the low oil prices, while key growth areas in the economy are heavily

transport-dependent (e.g., tourism and freight movement). Fuel demand (and, by implication, CO₂ emissions) has been very inelastic to price (i.e., demand does not move much with price), with current elasticities for petrol and diesel suggesting only a 2% - 2.5% long-run reduction in demand for a 10% increase in price.

- **the signalling of the announced carbon tax was not expected to have an effect on transport emissions. At the proposed level (\$15 per tonne of CO₂), it is expected to have little effect on behaviour. The price increase will be largely invisible within the overall movement in fuel prices caused by volatility in international oil markets**
- **a number of current policy initiatives are still to be fully implemented. However, these will provide only small, incremental CO₂ gains in the short to medium term.**

Fuel price and vehicle technology are two key international drivers over which New Zealand has very little control. The recent fuel price increases to around \$US 60/bbl have prompted some behaviour change from transport users. Although the precise impacts are still unclear, continued high oil prices will maintain price pressure on consumers to consider energy reductions and alternatives, and a number of lower CO₂ options will emerge in response to a sustained fuel price shift.

The overall effects of a sustained, higher, level of oil price may be more influential in reducing CO₂ emissions than the current range of policies.

A second issue is the current lack of cost-effective technological alternatives that provide significant CO₂ reductions. Unlike the electricity sector, for instance, where relatively low price signals can cause a switch between high emission generation (gas/coal) and low-emission alternatives (renewables), there are few comparable opportunities at this stage in transport. Future vehicle technologies are largely out of New Zealand's hands, as we are essentially technology takers from the global vehicle industry. There are some fuel-switching opportunities, and the recent oil price increases have put the first tranche of biofuels (about 10 PJ) now within the range of potential cost-effectiveness (albeit with the need for a range of supportive Government policies). However, this represents less than 5% of current transport energy demand, and even lower CO₂ emissions-reduction potential.

Much stronger intervention policies designed to change the composition of the vehicle fleet in New Zealand could be contemplated. However, at this stage, it is unclear to what extent this might have lasting, effective outcomes. There are also questions about whether this would be the best way of addressing the issue, and whether potential perverse effects can be addressed.

If a decision is made to delay the carbon tax or to set it at a very low level, then there are implications for transport policy. In the absence of a full carbon price signal affecting fossil derived transport fuels, alternative price incentives or disincentives for transport become more important.

The Review considers that the following options should be considered by the Government. All of them require further analysis:

- more efficient distribution of costs to road users by transferring a proportion of the rates contribution and ACC charges across fuel excise and RUC

- ongoing financial support for travel-demand initiatives and public transport ;
- opportunities around electrification of parts of the rail track
- a work programme to engage with the aviation industry on climate change matters
- for biofuels, evaluating a sales target above 2 PJ per annum and prioritisation of research effort
- increased priority to vehicle fuel-economy information
- for road vehicle fleets, a leadership role for the Government in purchasing and investigating opportunities under the FBT system
- targeting drivers of heavy fleets for information and training
- support for programmes for vehicle maintenance and fleet entry requirements, because of the co-benefits for CO₂ that could be available
- creating incentives for the purchase of vehicles with high fuel economy/low CO₂ emissions through price differential on annual vehicle charges.

There are a number of potential policies relating to transport that could, potentially, reduce CO₂ emissions from transport by 5%. These require further analysis.

7.6 Meeting our Kyoto Obligations in CP1 – the Broad Choices

Section 4.9 presented the results of ABARE modelling of the economic impacts of different approaches to meeting our Kyoto obligations.

The Review has drawn the following conclusions from that analysis:

- **if New Zealand decides to adopt new policies sufficient to allow the nation to meet its Kyoto obligations entirely through domestic abatement, the cost to the economy will be substantially higher compared to the option of purchasing some units on the international market.**
- **more work is required to determine the optimum trading strategy for New Zealand, and the optimum mix of new domestic abatement and international emissions trading.**

- **the total economic cost to New Zealand of excluding agriculture is high if New Zealand wishes to meet all its obligations through domestic abatement.** This is important, because as the Review has concluded in Section 4.8, there are practical limitations to imposing an emissions price on most agricultural emissions in the short term. If these limitations prevail in the design of future policy, this will amplify the potential advantages to New Zealand of using international emissions trading to meet at least some of its Kyoto commitments.

7.7 Prospects for Reducing New Zealand's Domestic Emissions in CP1

It is estimated that New Zealand will face a deficit of 36.2 Mt CO₂-e in CP1. In order to meet our Kyoto commitment for this period, New Zealand must reduce its domestic (net) emissions by this amount, or purchase units internationally commensurate to this amount, or combine both approaches.

From the information currently available, it is not possible to determine exactly the extent of possible (cost-effective) domestic emission savings in CP1. This is dependent on a range of factors such as the rate of technological development, the outcomes of specific reviews, plus factors beyond New Zealand's control such as the relative price of agricultural and forestry products on the international market. Further to this, there is some uncertainty as to the exact deficit that New Zealand will face in CP1. Again, this is dependent on a wide variety of factors such as the level of economic activity in New Zealand and offshore, the price of oil, and a range of issues relating to the measurement of our Kyoto obligations.

It is important however to gain a general feel for the level of domestic emission reductions that are possible in CP1. These should be regarded as potential emission reductions which are possible regardless of whether New Zealand chooses to employ a PBM, or regulatory or support-based policies in CP1. Depending on the mix of policies New Zealand employs in CP1, not all of these savings will be "unlocked". The list below does not aim to be comprehensive by any means, and it focuses on possible emission reductions that are likely to be cost-effective.

7.7.1 Opportunities to Reduce New Zealand's net emissions in CP1

- | | |
|-------------------------------------|---|
| Agriculture | Limited opportunities to reduce emissions in the short term. Opportunities exist around the changes at the margins of production system in the use of nitrogen fertilisers and of nitrogen inhibitors. |
| Energy | If implemented, the announced carbon tax is projected to achieve total savings of 13 Mt of CO ₂ e across CP1, largely in the energy sector. It is recommended that decisions on energy-efficiency and renewable-energy programmes are made once the NEECS review is completed. |
| Forestry and Land-Use Change | Because relatively little carbon would be sequestered during CP1 from new forest planting, the potential for new plantings to affect our domestic net emission position in CP1 is relatively small. Changes in estimated deforestation rates would have some effect. |

Transport There are no obvious “big win” CO₂ emissions-reduction opportunities at present; rather, the opportunities will generally be through small, incremental gains. These gains may result in reductions in New Zealand’s net emissions position of approximately 10% of its deficit although the costs associated with these gains is unclear.

It is unclear what level of domestic emissions reductions can be achieved in CP1 in a cost-effective manner. What does appear to be the case however is that the level of domestic reductions that can be achieved in a cost-effective manner is likely to be small relative to New Zealand’s net emissions position. This is consistent with the results from the ABARE modelling. Given this, New Zealand would be prudent to meet its Kyoto commitment by, partially at least, purchasing some Kyoto-compliant units internationally.

7.8 A Strategy for Purchasing Kyoto units using the Kyoto “Flexible Mechanisms”

There are a variety of issues (i.e. identifying the most appropriate objectives for a buying strategy, determining the most appropriate risk profile and managing timing of entry into the market) that surround the development of an appropriate and effective purchasing strategy for New Zealand to acquire Kyoto-compliant units. These issues highlight the need for the Government to urgently commission a work programme, if the option of purchasing units to meet some of New Zealand’s CP1 obligations is to be available.

Early commencement of this work would allow the greatest scope to develop a strategy that met purchasing objectives while managing fiscal risk. Given the considerable uncertainty that surrounds the future price of emission units, it would be preferable for New Zealand to be in a position to purchase at least some units during 2006.

A work programme should be commissioned to determine potential buying strategies for New Zealand that reflect New Zealand’s objectives in this area and our risk profile, along with issues of management, timing and price. Given the considerable uncertainty that surrounds the future price of emission units, early agreement by the Government to a buying strategy may prove to very important.

7.9 International Engagement

The international framework for dealing with climate change post-2012 is uncertain
[withheld under OIA s6(a), s9(2)(g)(i), s9(2)(j)]

While there is a growing consensus within the international community that climate change poses significant global risks over the medium to longer term, there is a divergence in views about the required pace of change and the best way forward. One “top down” approach is characterised by the definition of further emission reduction targets for developed countries in the near term based on projected long term climate change outcomes; such an approach might build on Kyoto Protocol or draw on

the tools developed in that framework. The alternative “bottom up” approach is focussed on technology development and deployment and sector specific policies and measures, with less attention given to achieving an explicit emissions target within a particular time frame. Within each of these broad approaches there are a spectrum of possible specific arrangements, each with different nuances and implications.

The complexity of the climate change issue has also increased as countries’ experience has demonstrated that securing emissions reductions is more difficult than originally anticipated. National economic interests, both short and long term, are now firmly in the mix when countries weigh up what action they are prepared to take on climate change. An increasing push for linkages between climate change and other agendas such as development, energy security and biodiversity is also apparent.

This uncertainty and complexity surrounding the evolution of a future international climate change framework combined with the difficulties New Zealand faces in reducing its emissions in the short to medium term entails important risks for New Zealand. International dialogue which leads to effective global action is essential to manage the degree of climate change we face. In addition, the particular circumstances and interests of Pacific Island Countries are important to New Zealand. There is a need also to manage the risk that an international process does not lead to a future framework which has a disproportionate impact on us. Our unique emission profile, economic structure, including the significance of agriculture and plantation forestry, and our geographic location means that we have particular interests which are not represented by other parties. The pace of emission reductions advocated by some countries would be difficult for New Zealand to deliver, without significant tradeoffs in other domestic policy objectives.

The next opportunity for international discussion on future action will be at the UN Climate Change Conference in Montreal, beginning 28 November.
[withheld under OIA s6(a), s9(2)(g)(i), s9(2)(j)]

Kyoto parties will also discuss at Montreal whether to begin consideration of further commitments for Annex I parties to Kyoto.

[withheld under OIA s6(a), s9(2)(g)(i), s9(2)(j)]

Looking beyond the UN Climate Change Conference, Montreal, ongoing international engagement to encourage effective action while managing the attendant risks to New Zealand will be required.

[withheld under OIA s6(a), s9(2)(g)(i), s9(2)(j)]

[withheld under OIA s6(a), s9(2)(g)(i), s9(2)(j)]

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