# The New Zealand Emissions Trading Scheme: A step in the right direction?

*David Bullock*

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AUTHORS David Bullock

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INSTITUTE OF POLICY STUDIES

School of Government
Victoria University of Wellington
Level 5
Railway Station Building
Bunny Street
Wellington
NEW ZEALAND

PO Box 600
Wellington
NEW ZEALAND

Email: ips@vuw.ac.nz
Phone: + 64 4 463 5307
Fax: + 64 4 463 7413
Website www.ips.ac.nz

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## Abstract

This paper examines the development, features, merits and likely impacts of the New Zealand Emissions Trading Scheme (as implemented by amendments the Climate Change Response Act 2002). First, the paper explores the history and debate surrounding selection of policy instruments to reduce New Zealand's greenhouse gas emissions with a particular focus on the New Zealand emissions trading scheme. Second, the paper describes the consultation processes that have been used in the development of the climate change policy in New Zealand. Third, the paper examines the sectoral requirements and effects of participation in the scheme and looks at the modelling of economic and environmental impacts that has been carried out by various organisations. Finally, some brief comparisons are made with schemes in other jurisdictions.

> Now is the time to confront this challenge once and for all. Delay is no longer an option. Denial is no longer an acceptable response. The stakes are too high. The consequences, too serious.
>
> Barack Obama, addressing the Governors' Global Climate Summit, November 2008.

## Introduction

Since the late 1970s the scientific evidence that the Earth's climate is warming as a result of the activities of humans has been growing. There is an overwhelming scientific consensus that anthropogenic climate change is occurring. What this will mean for humanity remains to be seen, but predictions are becoming increasingly grim.[1] Leading members of the scientific community have stressed that in order for the mitigation of climate change to have the greatest chance of succeeding strong action must be taken with haste; they have implored the governments of the world to cooperate to reduce greenhouse gas (GHG) emissions. Despite this, many governments have acted hesitantly in the development and implementation of climate change policy. However, in recent years, as the scientific evidence and public awareness of the issue has grown, the resolve of many governments has begun to strengthen and action has followed, although often only modest. Even so, however, effective action has been somewhat of a rarity compared to the rhetoric of unrealistic and unfulfilled goals.

Climate change presents the world with large, dynamic and multi-faceted issues, dilemmas and tradeoffs. In economic terms, climate change is a market failure of epic proportions. The climate itself can be described as a global 'public good', a good that is non-excludable (a person cannot be prevented from enjoying the climate if they do not pay) and non-rival (one person's enjoyment of the climate does not stop others enjoying it). The market cannot provide a non-excludable and non-rival good adequately or

[1] For a comprehensive synthesis of present climate science see the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (2007).

efficiently, leading to a market failure. Climate change is also an example of an externality problem. A negative externality is a cost that is created by a transaction but borne (at least in part) by third parties to that transaction (often society generally) – that is, the people who create the cost do not bear all of it. In the context of climate change, those who emit GHGs contribute to causing climate change, imposing a cost upon the world (both now and in the future), however, the emitters themselves do not bear the full costs of their actions. Because the emitter does not have to bear a significant proportion of the costs of their emissions, they have few incentives to reduce emissions, nor do they have to compensate those who suffer harm as a result of the costs (Stern, 2006).

Externality problems themselves are not uncommon, indeed a creative mind can find one almost anywhere – a factory polluting a waterway or you neighbour's music giving you a headache. These problems are often relatively easily solved, often through legal avenues such as the assigning of property rights, torts like private nuisance and regulation. What makes the externality problem created by climate change different is an issue of size and time frame. While externalities can often affect many people, the proportions of the externality created by climate change are unmatched. It is an issue that affects the entire planet and every person on it. No one government can solve the problem of climate change in isolation. Climate change extends long into the future; there are time lags both in how long the climate takes to respond to emissions and how long governments and societies take to acknowledge the problem and then to take action. The climate change problem also has significant distributional complexity; while everyone is affected, not everyone is affected in the same way or to the same extent. The damage caused by the production of a tonne of GHG is independent to where it was produced (Stern, 2006).

New Zealand's record on climate change has been poor. While emissions in the European Community have fallen by 2.2% over the period 1990-2006, New Zealand's emissions have increased by 25.7% (UNFCCC, 2008). Only five Annex 1 countries performed more poorly than New Zealand; it could be said that between 1990 and 2006 New Zealand has been a climate change leader for all the wrong reasons. It could be said that New Zealand has often put climate change in the 'too-hard basket' and claims are often made that effective action on climate change leads to a necessary consequence of economic hardship. However, over the 1990-2006 period some leading economies managed to reduce emissions significantly, without falling into a consequential economic gloom. In light of this, it is hard to escape the conclusion that New Zealand's emissions have not only been excessive, but also inexcusable.

**Table 1: Reducing or stabilising emissions has been achieved**[2]

| Country | Change in total aggregate GHG emissions (excluding LULUCF) over the period 1990-2006 |
|---|---|
| United Kingdom | - 15.1% |
| Sweden | - 8.7% |
| France | - 3.5% |
| The Netherlands | - 2.0% |
| Switzerland | 1% |
| Denmark | 2.2% |
| Japan | 5.3% |
| United States | 14.4% |
| Canada | 21.7% |
| Ireland | 25.6% |
| New Zealand | 25.7% |
| Australia | 28.8% |

***Source:*** **UNFCCC (2008)**

In late 2007 the Labour-led government signalled its intentions to establish the world's first emissions trading scheme (ETS) encompassing all sectors of the economy and all six Kyoto gases. This intention was given expression in September 2008 through the Climate Change Response (Emissions Trading) Amendment Act 2008 which amended the Climate Change Response Act 2002 (henceforth referred to as 'the Act'). The New Zealand Emissions Trading Scheme (NZETS) is a mechanism to bring New Zealand closer to meeting its Kyoto obligations and any future obligations that may be taken on in post-2012 agreements. It operates by requiring participants to surrender an emissions unit for each equivalent tonne of GHG they are deemed to emit. Participants in the scheme will either be freely allocated units or will have to buy them on the market for emissions units. This has the effect of requiring emitters to bear a cost for their emissions, creating priced-based incentives to reduce emissions as fewer emissions leads to lower costs for producers. This is passed on to consumers; more emissions-intensive goods will be more expensive; consumers then have the incentive to move away from these goods to cheaper, less emissions-intensive substitutes.

The reactions to the initial proposals for the scheme, and to the scheme itself have been varied. Some argue that the scheme does not go far enough in reducing emissions and is too soft on emitters. Others see the scheme as New Zealand 'running' before the international community can even 'walk' on climate change matters. They fear the scheme may have adverse economic effects if New Zealand's competitors in international markets do not adopt similar policies. Some say the scheme is a good way of addressing the climate change problem and New Zealand's obligations, while a few others still query whether there is even a problem to be addressed.

[2] Note, this data is on a *production* basis only. European states import many high-emissions products.

This paper provides an overview of the development, details and debate surrounding the NZETS as established by the Climate Change Response (Emissions Trading) Amendment Act 2008. It explores the different views, concerns and critiques that have been made by various organisations, interest groups and stakeholders during the scheme's development. It seeks to provide insights into why New Zealand now has an ETS, how it has been developed, what the scheme entails and what the prospects are for the future. The paper also briefly examines the nature of the NZETS in the context of the policy and proposals of other developed nations.

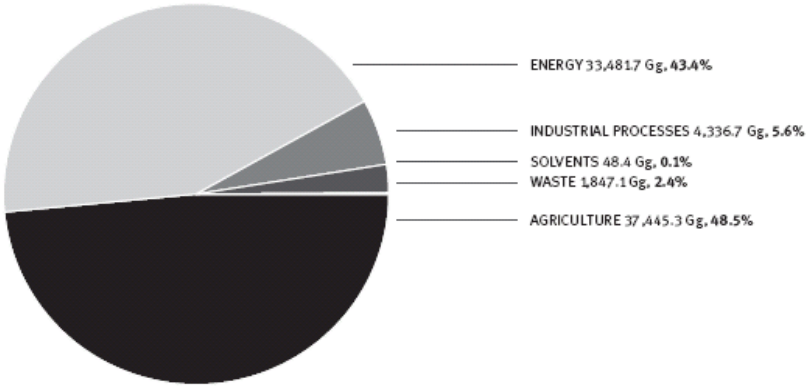
Following the 2008 general election the ETS legislation was returned to select committee as agreed by National and ACT in their confidence and supply agreement. Both parties had previously argued the legislation had been rushed and insufficiently consulted upon. The committee's terms of reference included consideration of: the likelihood of post-2012 agreement, the economic impact of climate policy on New Zealand, merits of an adaptation approach versus a mitigation approach, the merits of a carbon tax versus an ETS, the timing of introduction of the scheme, and the case for greater funding and regulation in this area. However, this paper will focus on the period up to the 2008 general election.

## The History of Climate Change Policy in New Zealand

New Zealand has long portrayed itself internationally as a 'clean and green' country, where environmental issues are taken seriously. Despite this, New Zealand's progress on climate change policy has been slow and hesitant at best. New Zealand's record for emissions reduction policy has involved a lot of rhetoric but few major substantive actions (although many minor policies have been put in place). Ambitious targets have been set, often with little clear thought on how they were to be achieved. On the occasions when major emissions reduction policy has been proposed, the government of the day has regularly been faced with significant public opposition and co-ordinated lobbying from interest groups who have feared that negative economic consequences would result from the implementation of climate change policy. More often than not, this has resulted in government back-downs or short-lived policies that were soon amended and watered down.

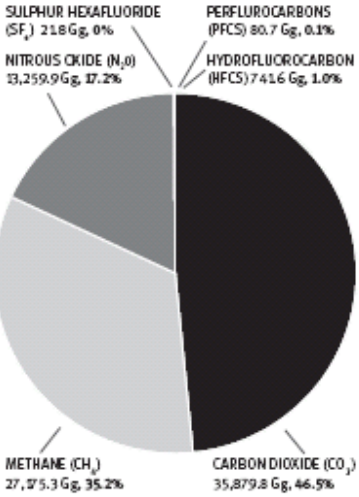
As a small country, New Zealand is only a very minor contributor to total global GHG emissions, producing approximately 0.3% of world emissions (MfE, 2007a). However, when adjusted for population, New Zealand ranks as the 12$^{th}$ highest emitter in the world (MfE, 2007a). This is largely as a result of New Zealand's high use of private transport and a large, emissions-intensive export sector (most notably agriculture). New Zealand has an unusual emissions profile (see Fig. 1 and Fig. 2), with nearly 50% of emissions coming from agriculture, compared to 12% on average in other developed nations (MfE, 2007a). New Zealand also has a significant renewable electricity generation capacity (approximately 70% of total generation) leading to New Zealand's emissions from electricity generation amounting to a smaller proportion of total emissions than other developed nations. Over the last 20 years New Zealand's emissions have continued to grow and are predicted to grow further in coming years if a 'business-as-usual'(BAU) scenario is maintained (see Fig. 3).

**Fig. 1 New Zealand's sectoral emissions in 2005 (all figures Gg $CO_2$-e)**



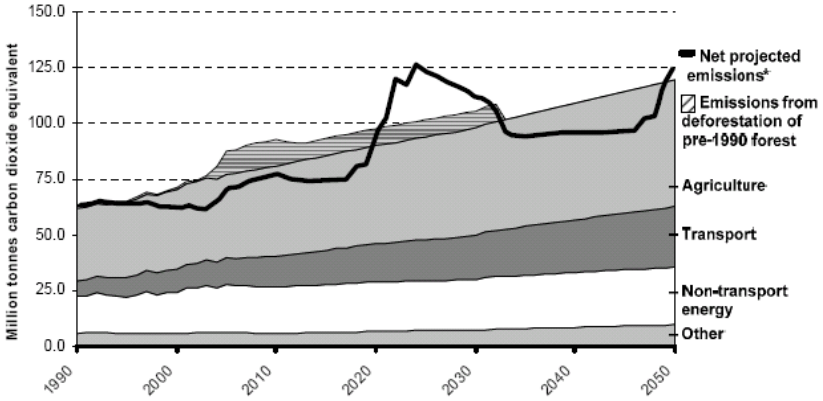

***Source:*** **Ministry for the Environment (2007f)**

**Fig. 2 New Zealand's Emissions by gas in** 2005 (all figures Gg $CO_2$-e)




***Source:*** **Ministry for the Environment (2007f)**

**Fig. 3 New Zealand's predicted GHG emissions 1990-2050**




***Source:*** **Ministry for the Environment (2007a)**

New Zealand governments have repeatedly committed to taking action on climate change, setting emissions reduction targets both on their own initiative and in accordance with international agreements. New Zealand's history on climate change policy began near the end of the fourth Labour Government's final term in August 1990. An ambitious goal was set of reducing net $CO_2$ emissions by 20% from 1990 levels by 2005. Following its victory in the 1990 general election, the National government released a 'Carbon Dioxide Reduction Action Plan' in 1992 which retained the target set by the previous government (while reducing the proposed date for the reduction from 2005 to 2000) and set out energy efficiency and forestry initiatives to assist in achieving this goal (Boston, 2007).

In 1992 New Zealand signed the United Nations Framework Convention on Climate Change (UNFCCC), the key international framework treaty for intergovernmental efforts to address climate change. The convention requires governments to share information on emissions and policies, to launch national strategies dealing with GHG emissions, to provide financial and technological support to developing countries and to cooperate in preparing for the impacts of climate change (MfE, 2005). New Zealand ratified the UNFCCC in 1993 and previous targets and government policies were adjusted to bring New Zealand's position in line with those of other Annex I countries. The new target involved a reduction to 1990 levels by 2000, a significantly less demanding target than the bold goal of a 20% reduction on 1990 levels that had been previously proposed. At the time, the National government proposed a NZ$10/t carbon tax to be used to meet this target, but this was eventually dropped in favour of voluntary agreements from industry, greater monitoring of emissions, and an increase in forest planting. The government threatened that a carbon tax would be introduced in 1997 if (particularly industry) emissions were not reduced. Despite emissions continuing to rise, the government backed down on its threat and talk of a carbon tax was quietly dropped.

In 1997 New Zealand adopted the Kyoto Protocol target of reducing emissions to 1990 levels (on average) between 2008 and 2012; this was consistent with the trend of New Zealand governments setting less ambitious targets as time progressed. Kyoto was signed by New Zealand the following year. The Kyoto Protocol is a protocol to the UNFCCC that sets legally binding reduction commitments for six greenhouse gases (carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons) produced by Annex I countries (industrialised nations). Collectively, Annex I countries agreed to reduce their emissions by 5.2% from 1990 levels during the first commitment period (CP1), spanning 2008 to 2012.

**Table 2: Emissions reduction targets set by various New Zealand governments 1990-1997**

| Year | Target |
|---|---|
| 1990 | To reduce $CO_2$ emissions by 20% from 1990 levels by 2005. |
| 1992 | To reduce $CO_2$ emissions by 20% from 1990 levels by 2000. |
| 1994 | To reduce $CO_2$-e emissions to 1990 levels by 2000. |
| 1997 (Kyoto target) | To reduce $CO_2$-e emission to 1990 levels during the first Kyoto commitment period (2008-2012). |

New Zealand ratified Kyoto in 2002 (it became operative in 2005). At this time New Zealand was predicted to be a net economic beneficiary during CP1 due to its forest sinks (MfE, 2005). The Labour-led government proposed a climate change policy package which contained a carbon tax (capped at $25/t) for energy, industry and transport, 'Negotiated Greenhouse Agreements' for 'at risk' large emitters, 'Projects to Reduce Emissions' designed to provide Kyoto units to projects to encourage further emissions reductions, and greater funding for research into reducing agricultural emissions (MfE 2005). A review of these policies was undertaken in 2005 following revised projections of New Zealand's GHG emissions that indicated the country would fall well short of its Kyoto obligations. Following this, the government outlined its proposed climate change policy, central to which was a wide reaching carbon tax (capped at NZ$25/t) to take effect by the start of CP1 in 2008. The proposed carbon tax was abandoned after the 2005 general election when the Labour-led government lost its majority support for the tax (neither of its two main support partners, New Zealand First and United Future, were willing to support the tax). Without parliamentary support for a tax, emissions trading was left as the only politically viable and cost-effective climate change policy option for the Labour-led government.

## Consultation with stakeholders 2000-2005

The Labour-led government was involved in stakeholder consultation long before the Kyoto Protocol was ratified. The Ministry of Economic Development led a working group focused on the design of an ETS until late 2001, this included meeting with sectoral stakeholders.[3] Dialogue sessions were held with representatives from the transport and oil sectors, the waste sector, and the coal, gas and geothermal industries. Overall industry representatives generally favoured down-stream points of obligation because they argued this would have the largest incentive effect on consumers, while officials favoured upstream points of obligation as they incur lower administrative costs and still carry incentive effects for emitters passed down through prices. Representatives also expressed concerns about loss of international competitiveness, loss of domestic competitiveness (e.g. coal) and uncertainties and inaccuracies of emissions measurement. Similar sentiments were expressed in dialogue with stakeholders from industries that used GHG emitting industrial processes. These industries also favoured a greater use of

[3] Summaries of these consultation meetings can be founds on the Ministry of Economic Development's website. http://www.med.govt.nz/templates/ContentTopicSummary____16251.aspx (last accessed 14/1/09).

either complementary or alternative regulatory measures. In dialogue sessions with the waste industry there was general agreement that the best location for points of obligation were landfill operators. However, some questioned whether the industry would be responsive to an ETS given that many landfill operators had already implemented emissions reduction technologies and that other options such as increased recycling were not economically viable. In the dialogue session with stakeholders from the agriculture sector the majority of discussion centred on the allocation on permits, measurement difficulties and trade issues.

In late 2001 the consultation and communications team of the Department of Prime Minister and Cabinet (DPMC) published the results of the consultation process it had undertaken on the issue of whether New Zealand should ratify the Kyoto Protocol (DPMC, 2002a). The consultation took the form of a representative telephone survey, written submissions and meetings. Many of the findings noted in the report echoed other consultations: concerns about costs, measurement and international competitiveness. According to the DPMC, stakeholders gave little clear indication as to what policies they preferred. However, those who did expressed a preference for a carbon tax or charge over an ETS because of the perceived complexities of the latter. The report also notes that many smaller stakeholders (e.g. agriculture, small businesses, private individuals) lacked a real understanding of New Zealand's international obligations and the issues involved in the consultation processes. Some Māori submitters were concerned that climate change policy may erode the value of past and future Treaty settlement assets and believed that the introduction of emissions trading did not sufficiently consider Maori spiritual values and cultural practices. Of the small number of submitters who discussed emissions trading, the majority thought that an emitter level (upstream) point of obligation was appropriate. Interestingly, it was typically energy sector respondents who favoured a higher-level point of obligation. The question how permits should be allocated under an ETS also received limited responses. Of those who did comment, environmental groups typically favoured the auctioning of permits (they saw 'grandparenting' of permits as effectively rewarding emitters), whereas energy and industry stakeholders generally favoured 'grandparenting' or 'hybrid' arrangements.

The DPMC produced a second consultation document early in 2002 (DPMC, 2002b). This document was a response to the preferred policy package that had been formulated by the government. Unlike the previous report, it was found that many stakeholders appeared to understand and generally accept the direction of the policy programme. Some stakeholders, particularly environmental groups, were concerned that the government's policy package did not do enough to reduce industry emissions, and instead relied too heavily on carbon sinks. Some in the business sector, on the other hand, remained concerned that the government was not doing enough to protect their trade competitiveness.

**Consultation with stakeholders 2006-2008**

In 2006 the government engaged in wide ranging public consultation on the nature of its policy response to climate change. This consultation involved interest groups, key stakeholders, scientific and economic experts and Māori. As previously mentioned, by this time the introduction of a carbon tax was unlikely, and officials turned their attention to an ETS specifically. As part of the consultation process, the government released five

consultation documents in December 2006 and called for submissions. The documents related to both climate change and energy policy under the general banner of the "Draft New Zealand Energy Strategy", they were titled:

- *Measures to Reduce Greenhouse Gas Emissions Post 2012*
- *Transitional Measures for Electricity and Stationary Energy Supply*
- *Sustainable Land Management and Climate Change*
- *Powering Our Future – New Zealand Energy Strategy*
- *New Zealand Energy Efficiency and Conservation Strategy.*

According to the Ministry for the Environment, the consultation process included approximately 50 public or multi-sector meetings, workshops and Hui, and approximately 100 focused stakeholder meetings. These events took place throughout the country, with over 4,000 people attending in total (MfE, 2007c).

As part of this consultation process, 13 regional Hui were held around the country to provide Māori with a forum to discuss views on climate change policy and to make submissions on the aforementioned consultation documents. The general response from these Hui was that Māori recognised climate change as an important issue and that urgently required attention. It was emphasised that the formation of policy on climate change ought to take Māori values into account and ought to be consistent with the principles of the Treaty of Waitangi. Concerns were raised that the implications of Kyoto for Māori land owners, particularly forest owners, had not been fully considered. Other concerns centred on the possible land use implications for tribes that had already settled with the Crown, and that ought to be entitled to 'carbon credits' generated from Māori forests (MfE, 2007d).

The paper *Measures to Reduce Greenhouse Gas Emissions Post 2012* received 1,776 submissions, 1607 of which were based on a template produced by Greenpeace Aotearoa New Zealand. These were treated separately for the purposes of the Ministry's analysis. The paper covered a wide range of topics, but some are of particular usefulness in the context of the ETS. Analysis of the submissions showed that 88% generally supported the use of a price-based measure and 79% supported an ETS specifically (MfE, 2007e), but it was also considered that such measures were not sufficient on their own and needed to be complemented with other policy such as increased education and greater funding for public transport and research and development. Submissions from environmental NGOs tended to favour the use of an emissions charge if a trading scheme could not be set up in the short term. Many of the submissions from business and industry groups stated that they did not want to see a price-based measured used in New Zealand ahead of similar measures being used by New Zealand's major trading competitors – if this condition was not met other measures need to be taken in order to address competitiveness-at-risk concerns. These submissions argued that a considerable 'lead-in time' would be needed to enable firms to gain expertise in measuring emissions. They also argued, in general, that all sectors needed to be included in an ETS in the long run for an equitable outcome, but that aviation, agriculture and trade exposed industries should be exempt in the short run. Most submissions thought that an ETS ought to be linked to a broad international market.

Submissions were divided on the allocation of permits. Environmental NGOs and academics rejected 'grandparenting' of permits, typically in favour of auctioning, while

acknowledging that in some cases free permits would have to be allocated to 'competitiveness at risk' firms. Industry and business submissions were strongly in favour of the allocation of free permits to 'competitiveness at risk' firms, and argued that firms that can pass on their costs should be required to purchase permits from the government.

In late 2007 this consultation and continuing policy development culminated in the production of *The Framework for a New Zealand Emissions Trading Scheme* (MfE, 2007a) and the accompanying Climate Change (Emissions Trading and Renewable Preferences) Bill. The Bill was split at the Committee of the Whole House stage into the Climate Change Response (Emissions Trading) Bill and the Electricity (Renewable Preferences) Amendment Bill.

The Bill passed its key second reading with support from the Greens and New Zealand First, and was passed into law on 25 September 2008. The Greens expressed concern that the Bill did not go far enough, having traditionally preferred a carbon tax. However, their support was won with concession on a $1 billion household fund designed to reduce household emissions by improving insulation.

**Options for reducing emissions**

It is well recognised that voluntary measures alone are unlikely to be enough to make significant reductions of emissions; economic instruments are needed to provide tangible incentives to the market. Miliniski *et al.* (2008) studied the effectiveness of voluntary contributions to mitigating climate. Despite finding that human altruism was effective in some circumstances (and could be encouraged), they concluded that climate change was a 'tragedy of the commons, because those who do not invest have a larger net benefit as they rely on others' altruism'. There are two main options for governments seeking to use price-based economic instruments to reduce GHG emissions – emissions taxes or emissions trading schemes. These market-based instruments are typically preferred to more regulatory 'command and control' style systems because market-based instruments create incentives that achieve lowest total cost of abatement, even if the details of the costs are not explicitly known (Sin, Kerr and Hendy, 2005). The literature is divided on the merits of each, and the applicability of each to New Zealand has been well discussed.

A tax is a traditional response to environmental externalities. A tax is designed to internalise the externalities (i.e. costs that are not accounted for in a good's market price) created by the production (or consumption) of a good. The goal is to ensure that the person who creates a harm should pay for it. Obviously, once the producers of an environmentally unsound product are forced to bear the full costs of their activities, they will have incentives to reduce the environmental harm they create so as to face a lesser tax burden.

An ETS is based on tradable permits. An acceptable total amount of GHG emissions is determined by a government (or the government's international agreements) who then allocates, by sale or for free, permits that allow a holder to emit a proportion of that total amount. These permits can then be traded with other firms. This enables firms who reduce emissions to be able to benefit by selling excess units (and needing to buy fewer). Other firms may not be able to reduce their emissions, or doing so may be highly

expensive, therefore they must buy permits to account for their emissions. The price of the permits would then ideally adjust to reflect the marginal cost of reducing emissions (Sin, Kerr and Hendy, 2005). Both schemes must involve the monitoring of emitters in order to enforce compliance. The two approaches also both entail administrative costs, it is often argued that taxes are more administratively 'simple' than trading schemes as no permits need to be registered or traded. However, permit schemes often have a wider coverage than taxes. Under a tax, relief is provided most simply by providing an exemption to the tax, but this removes the party from the scheme. Under an ETS relief can be provided through the allocation of permits, enabling the party to remain in the scheme with reduced obligations (Sin, Kerr and Hendy, 2005). In this case incentives to reduce emissions remain, even if a firm is allocated units covering all of its emissions, as a reduction in emissions enables the firm to have excess units which can be sold. Sin, Kerr and Hendy (2005) found that a well functioning auctioned permit scheme is the exact equivalent to a tax in terms of the incidence of the costs and wealth transfers. If permits were not auctioned and instead simply allocated, a similar effect to a tax is still achieved; the allocation provides a wealth transfer and makes no change to efficiency or incentives to abate.

Bertram and Terry (2008) argued that the NZETS is not an ETS at all, rather it is a tax that is payable with tradable vouchers. They assume that the NZETS lacks a 'cap' on emissions. The foundations for this assumption are questionable as while the New Zealand scheme does not directly provide a domestic cap, a wider international cap is stipulated under the Kyoto agreement for CP1 within which the NZETS operates. However, this cap is not an absolute limit on emissions as Annex B countries can earn units through Kyoto's Clean Development Mechanism (CDM) or through the use of domestic forest carbon sinks enabling them to emit more than their aggregate cap (MfE 2007a).

Market-based measures such as a tax or trading scheme may provide the government with a source of revenue. Sin, Kerr and Hendy (2005) argue that revenue generated through climate policy should be used to reduce other taxes. They argue that revenue from climate policies should not be treated any differently to other sources of government revenue. Using this revenue to provide compensation to sectors affected by the scheme, or to fund other environmental policy – that is, to 'earmark' revenue – is also not advised. It is argued that using revenue to compensate sectors can reduce economic and environmental efficiency and that other environmental policy should be considered on its own merits. However, the authors note that from a political perspective it is often important to use at least some of the revenue generated to fund other climate and environmental policy. Failure to do this may cause public support for the use of the instrument to fall as this can give the public the perception that the instrument is merely being used as a revenue-gathering tool, rather than as a measure to protect the environment. There is also often a strong political imperative to use revenue from an ETS to compensate and protect particular industries, even though this may conflict with environmental aims.

Müller (2008) notes that an aversion to earmarking is commonplace amongst treasury officials and economists more generally. The objections to earmarking include claims that it leads to a misallocation of resources, restricts budgetary control (it ties up government resources) and can lead to budgetary inflexibility (McCleary, 1991). Müller

notes that, on the contrary, earmarking can protect high-priority programs from shifting majorities, inefficiency and corruption, give policy stability and avoid unnecessary haggling over funding levels. Müller concludes that strong arguments can be made for the earmarking of revenue gained from climate policy.

Risk is a key factor in determining the policy choice. Reducing policy uncertainty improves the efficiency of either option, as firms are more confident when making investment decisions. However, risk cannot be completely eliminated and it is important that the risk that remains is allocated between the relevant parties as optimally as possible. An over-allocation of risk to some firms will cause them to reduce investment. One particular cause of uncertainty in trading schemes are shocks in the market for permits (e.g. the price shocks seen in the current financial crisis). If a firm can spread this risk over time it can be reduced. The government can aid this if it enables firms to bank permits (Sin, Kerr and Hendy, 2005). Risk can also be spread through the 'borrowing' of permits from free allocation in future periods.

Under either system there is a risk that firms will engage in strategic behaviour. This could take the form of strategic investment, lobbying or the misrepresentation of costs (Sin, Kerr and Hendy, 2005). Market dominance may also emerge under a permit system, where a firm uses its market power to manipulate the market for permits. However, it is argued that this behaviour is only likely to happen if there is no functioning international market. It is possible that the creation of the NZUs under the NZETS some of the large players in New Zealand (such as the large renewable electricity generators) may be able to exert some influence on the market for NZUs. Whether this will actually occur remains to be seen.

Despite the wide-ranging analysis undertaken on both policy options, New Zealand's future was largely decided in the public uproar over the proposed carbon tax in 2005. From a political economy perspective, a trading scheme is more likely to find favour, particularly in the business community. It is perceived that an ETS leaves more control in the hands of participants in how they meet their obligations. The decision to use an ETS stemmed directly from the consultation process undertaken in 2006. According to the government, this process concluded that and ETS offered the 'most flexible, effective, fairest, and least-cost option to reducing New Zealand's greenhouse gas emissions', it was also the option most favoured by submitters (MfE, 2007b). The government described a tax as a 'blunt instrument that would require regular alteration to ensure its effectiveness and to keep it in line with international emissions prices' (MfE, 2007a). It is interesting to note that the two parties on the opposite ends of the political spectrum, the ACT party and the Green party, both favoured a carbon tax over an ETS. The Greens saw as tax a more environmentally effective while ACT saw a tax as a lower-cost option as it was perceived to require less administration.

**Table 3: Comparison of different policy options for reducing emissions**

| | Advantages | Disadvantages |
|---|---|---|
| **Tax** | Tax level isolated from market shocks (it is set independently of market pressures).<br><br>Relatively simple administration, mechanisms already exist for collecting taxes.<br><br>Low compliance costs; participants do not need to buy units.<br><br>Can be more widely applicable directly; rather than focusing on a few points of obligation, a tax can be applied to products at the point of sale.<br><br>Revenue fro m a tax can be recycled into other environmental or economic programmes. | Vulnerable to political manipulation, particularly a reduction in the tax rate.<br><br>Taxes are often politically unpopular.<br><br>Examples of overseas policies favour emissions trading which may make a tax difficult to link internationally.<br><br>Monitoring required for compliance.<br><br>Do not automatically adjust to inflation or external economic shocks.<br><br>No set amount of reductions or emissions. |
| **ETS** | In theory leads to emissions reductions where abatement costs are lowest and the price of permits ideally adjusts to the marginal cost of abatement.<br><br>Firms can have partial obligations which continue to provide incentives to reduce emissions.<br><br>Seen as a 'market-based solution to a market-based problem', this flexibility is appealing to the private sector.<br><br>Greater ability to be linked internationally than a tax.<br><br>Capped systems can ensure a certain environmental outcome by fixing the amount of emissions allowed.<br><br>The 'grandfathering' of units mean a lower cost for participants than under a tax system. | Effectiveness is dependant of the price of units. Price shocks or over-allocation may undermine the effectiveness of a scheme.<br><br>Fluctuating and unstable unit markets create uncertainty for participants.<br><br>Monitoring required for compliance. Participants must source units to pay for their emissions, increasing transaction, search and compliance costs.<br><br>Vulnerable to strategic behaviour by firms and traders. |
| **Voluntary schemes** | Low cost and administratively simple. The government may want to run public information campaigns but does not need to collect a tax or units and it does not need to enforce accurate monitoring of emissions<br><br>Low compliance costs, participants do not need to pay a tax, surrender units or accurately monitor emissions.<br><br>Does not require coercive action by the government. | Free-rider problems; people have incentives not to participate. Coordination problems exist in organising collective action. These problems lead to low participation and limited effectiveness of voluntary schemes. |

**The Climate Change (Emissions Trading and Renewable Preference) Bill**

The Climate Change (Emissions Trading and Renewable Preference) Bill (later called the Climate Change Response (Emissions Trading) Amendment Bill) set out the framework for the NZETS. The main framework of the scheme was set out in the new Parts 4 and 5 of the Climate Change Response Act 2002. Part 4 outlined the general framework of the scheme while Part 5 gave sector specific details. Subpart 1 of Part 4 detailed the identity and obligations of participants in the scheme; participants (either mandatory or voluntary) were defined on the basis of the particular activity they were engaged in (Schedule 3 and Schedule 4). Subpart 2 of Part 4 established a policy for the issuance and allocation of NZUs by the government. Part 4, subpart 3 set out the function and responsibilities of the chief executive administering the scheme. Part 4 subparts 4, 5, and 6 dealt with offences and penalties, review and appeal provisions and miscellaneous provisions respectively. Part 5 of the Bill set out sector specific provisions for forestry, liquid fossil fuels, stationary energy and agriculture. These focused on sector specific obligations and exemptions. Part 5 also included transitional provisions.

The Bill had a number of key features (MfE, 2007):

- An obligation on participants to hold units matching their emissions.
- The inclusion of all major sectors and Kyoto gases.
- A staggered entry of sectors so that all sectors would have entered the scheme by 2013.
- The devolution to landowners of both the credits for afforestation activities (for post 1989 forests) and the liabilities for the release of $CO_2$ through harvesting and deforestation.
- Units will be held by three groups – a) those with obligations to surrender units, b) those who receive freely allocated units or those who receive units for eligible afforestation, and c) those who engage in trading activities.
- NZUs were to be the primary unit of trade and would be fully backed and comparable with Kyoto units during CP1.
- Penalties for non-compliance
- Adaptability with potential post-2012 international agreements.
- Free allocation of units

**Select Committee**

The Bill was sent to the Finance and exprenditure committee for consideration in September 2008. The committee received 259 submissions from a wide range of stakeholders and heard 161 of these submitters in hearings held in Auckland, Wellington and Christchurch. For this matter, the Finance and Expenditure Select Committee was comprised 5 Labour MPs, 3 National MPs, 1 Green MP, 1 Maori Party MP, 1 ACT MP, 1 United Future MP and 1 New Zealand First MP. The membership of the committee consisted of:

- Charles Chauvel (Chairperson) – Labour
- Hon Bill English – National
- Jeanette Fitzsimons – Green
- Hon David Carter (replaced Craig Foss) – Labour
- Hon Mark Gosche – Labour
- Hone Harawira – Maori
- Rodney Hide – ACT
- Moana Mackey – Labour
- Dr the Hon Lockwood Smith (Deputy Chairperson) – National
- Hon Paul Swain – Labour
- Hon Dr Nick Smith (replaced Chris Tremain) – National
- Judy Turner – United Future
- R Doug Woolerton – New Zealand First

The Committee's report was detailed and many issues were discussed. It is not necessary to comprehensively cover the select committee's findings here. However some points of particular salience are noted below. The most notable controversial issues included:

- At what stage agriculture and liquid fossil fuels should enter the scheme?
- The free allocation of units – what process, how many units, to whom, and for how long?
- International linkages and the use international units.
- Pre-1990 forest arrangements

The report noted that many submitters thought the NZETS was moving ahead of the rest of the world, not in line with it, and that this may put trade competitiveness at risk. The committee responded that the NZETS was consistent with the initial design of the Australian scheme, that Annex 1 countries that do not include all sectors in their scheme must still be the costs they create (this is often covered in other ways, for example, high petrol taxes in Europe) and that the NZETS reflected New Zealand's unique emissions profile.

The committee favoured a staggered introduction of sectors as proposed in the Bill. Of note, the majority of the committee agree with the government's suggestion that the introduction of the liquid fuels sector should be delayed from 2009 to 2011 due to an uncertain economic climate and domestic inflationary pressures. This justification was weak. Climate change policy must have a long-term focus; if it is watered down to ease short-term political pressures it may jeopardise the policy's effectiveness. This decision was founded on the high price of oil at the time. However, since the bill was passed the international price of oil has fallen significantly (from approximately US$140 in July

2008 to US$40 in February 2009). Undoubtedly economic uncertainties, high prices and inflationary pressures will reoccur after 2011 – this move suggests that the government may be willing to ease climate policy when economic times are tough. This can be further illustrated by the terms of reference of the Emissions Trading Scheme Review Committee for their 2009 review of the ETS legislation. The terms of reference ask the Committee to assess the impacts of the ETS on the New Zealand economy and households while 'having regard to the weak state of the economy'.[4] Furthermore, this sends a message to powerful interest groups that the government will be willing to sacrifice climate policy in difficult circumstances, creating incentives for such interest groups to put up obstacles towards such policy.

The committee also noted that there were competing arguments as to when the agriculture sector ought to be included. Arguments for early inclusion were for the most part based on the fact that agriculture produces close to half of New Zealand's GHG emissions. The Green party opposed a delayed entry of agriculture into the ETS. However, the majority of the committee decided that an early inclusion was impractical given monitoring difficulties and the need to finalise the allocation of units and the point of obligation. The committee recommended voluntary reporting for the agriculture sector in 2011, mandatory reporting in 2012 and obligations from 2013.

The phasing out of free allocation was an issue for many submitters. The majority of the committee recommended delaying the phase out by five years (from 2013 to 2018). The Green party strongly opposed this delay. The committee rejected submissions that a price cap on carbon should be introduced into the scheme in order to reduce uncertainty. The committee found that a cap may undermine the scheme if set too low, and would be ineffective if set too high. It also found that a cap would be unnecessary in the scheme as proposed and may provide a barrier to international linkages.

The committee recognised a wide range of arguments about whether international units should be used to meet obligations under the NZETS. The advantage of including international units was that it would provide a wide pool of units for participants to choose from, reducing their compliances costs. However, the committee recognised the need to preserve future international linkages and was concerned that 'the inclusion of imported AAUs in the NZETS could be an obstacle in the future to linking the NZETS to other trading schemes that prohibit such units'. This concern particularly related to so called 'hot air' AAUs sourced mainly from Eastern European states.[5] The committee recommended that a prohibition be placed on the use of CP1 AAUs in the NZETS during later commitment periods. Restrictions on the use of some0 imported AAUs were left to be decided in regulations. Any restrictions would not prevent participants holding imported AAUs, but would prevent them being surrendered to meet obligations under the NZETS.

[4] The full terms of reference can be found at: http://www.parliament.nz/en-NZ/SC/Details/EmissionsTrading/9/b/e/00SCETS_TOR_1-Terms-of-reference-of-the-Emissions-Trading-Scheme-Review.htm (last accessed 14/1/09).

[5] 'Hot air AAUs' refer to AAUs that have been generated as a result of reduced emissions due to an economic recession in their country of origin. The environmental credibility of such units is often questionable and they are generally regarded as poor quality units.

The treatment of pre-1990 forests was a contentious issue. Owners opposed the 1 January 2008 entry date for forestry arguing that the entry of forestry alone (two years before any other sector) placed an unjustified burden on the forestry sector and left them without other parties to trade units with. The question of whether indigenous pre-1990 forests would be included had been left open throughout the consultation processes. The select committee considered this matter and it was decided that there was no need to include pre-1990 indigenous forests as sufficient control mechanisms were already in place to limit deforestation of these forests. It was submitted that Māori land and land being used renewable generation of electricity should be exempt. However, the committee did not support this on the grounds that these parties ought to bear the costs of their emissions.

The committee received a number of submissions on what the point of obligation ought to be in the agriculture sector. Arguments were made for both farm level and processor level points of obligation. The committee acknowledged that while a processor level point of obligation would be easier to implement, it was likely to be less effective in changing behaviour than a farm level point of obligation. The committee noted the need for the government to resolve at an early stage where the point of obligation would lie, by default it would be at a processor level but this could be changed with an order-in-council. While farmer-level monitoring faced technical difficulties the committee recommended that the Bill should include an enabling provision that would allow farmers to opt-in to a farm level point of obligation if it was left at the default of processor level.

*Minority Views*

Both the National Party and the Green Party contributed minority views. The National Party accepted that climate change presents a significant environmental challenge and supported an ETS, it argued, however, that the proposed scheme did not do enough to protect the economy or the environment. It contended that the bill had been rushed and that insufficient consultation had occurred. National argued that, being only a small contributor to global emissions, New Zealand should not be a leader in climate change policy and rather it should follow the lead of other nations, particularly Australia. National also wanted a specific target of emissions representing a 50% reduction of 1990 levels by 2050 to be included in the legislation. It is intriguing that National suggested this target, as such a target is unlikely to be achieved without New Zealand being a climate change leader, at least in respect of reductions in agriculture emissions. National opposed the government receiving over $20 billion of windfall profits from the scheme. However, whether such windfall profits would actually exist given the costs of free allocation and administration was a point of contention. As could be expected, the party had serious concerns about what the NZETS would mean for industry in New Zealand. It argued that the NZETS would create incentives for New Zealand industries to relocate overseas, and that more flexibility was needed in the phasing out of industry support (it suggested that this may need to extend beyond the 2030 deadline). National agreed that agriculture should be included in the scheme but it argued that the scheme did not provide enough incentives for farmers to reduce their emissions and that greater funding needed to be put into research and development. The party opposed the 'arbitrary' distinctions of forest types created via the scheme (and Kyoto) and also argued that there would be difficulty trading NZUs as units from forestry were not accepted in the EUETS. It was argued that greater protection was needed for the fishing industry and that refrigeration industry should be given other options to manage emissions. National

disagreed with the moratorium on new thermal generation and believed a better approach would be to provide a price signal by including electricity generation as the first sector with obligations in the ETS.

The Green Party preferred a carbon tax to emissions trading, arguing that a tax would be more environmentally effective, simple and would have lower administration costs. The revenue generated by a tax could then be put into emissions reduction programmes. The Greens argued that the ETS is not a 'cap and trade' scheme as it lacks a cap on New Zealand emissions. It argued that NZUs were unnecessary and that international Kyoto units would be sufficient, also they feared that a future government could allocate more NZUs to drop their price, thereby harming those who have invested in low emissions technology. The party disagreed with the decision to delay the inclusion of sectors such as agriculture and transport into the scheme and believed that in many cases emissions would be 'grandparented' for too long. The Greens expressed concern that too many key features of the bill were being left to subsequent regulations, rather than being set in the legislation itself. The party were concerned that, initially at least, some emitters were bearing an inequitably great burden, while others had few or no obligations. It argued that the legislation did not do enough to protect regenerating indigenous forest, and that foresters may clear indigenous forest to plant exotic forest species, harming biodiversity.

**The passage of the Climate Change Response (Emissions Trading) Amendment Bill**

The Labour-led government alone lacked a parliamentary majority to pass the Bill into law. National, ACT and United Future were not willing to support the passage of the Bill and the government did not want to rely on the Māori Party for support. The government required the support of New Zealand First and the Green Party to gain sufficient numbers in the House. As previously mentioned, the Green Party preferred a carbon tax to an ETS, but was unwilling to be seen to be preventing climate change policy being enacted, so supported the passage of the legislation on the basis of it being better than doing nothing (Oliver, 2008). The Green Party also won a concession from the Labour-led government in the form of a 15-year NZ$1 billion household insulation fund that was to be funded through the profits the NZETS would provide to state owned power companies. For their support, New Zealand First won a number of concessions including electricity rebates and cash payments to those on fixed incomes to ease the effect of increased electricity prices under the NZETS and the free allocation of NZUs to the fishing industry to cover increased fuel costs. With the support of the Green Party and New Zealand First the Act passed its third reading (see table 4) on 9 September 2008 and was given Royal assent on 25 September 2008.

**Table 4: Voting on the third reading of the Bill**

| | |
|---|---|
| Ayes: 63 | Labour 49; New Zealand First 7; Green Party 6; Progressive 1. |
| Noes: 57 | National 47; Māori Party 4; United Future 2; ACT 2; Independents: Copeland, Field. |

***Source:*** **Hansard**

## Sectoral impacts of the NZETS

The various sectors of the economy all contribute to New Zealand's emissions in different ways and each sector will face different challenges from participation in the NZETS. The NZETS is the first emissions trading scheme in the world to cover all sectors and all Kyoto gases. Under the 2008 legislation the introduction of sectors into the scheme is staggered over a five-year period, with all sectors to be included in 2013. The government protects some sectors once they have entered the scheme by a free allocation of NZUs, so such sectors will not have to bear the full costs of their emissions for some decades. Each major sector is treated separately by the scheme, allowing the differences in each to be addressed. Notwithstanding this, the Act is only a framework for the scheme, many technical aspects of the scheme are not specified and will be left to be created through regulations in the next few years (for example, the placing of points of obligation in the agriculture sector and developing measurement requirements for all sectors).

**Table 5: Sectoral overview of the NZETS**

| Sector | Entry (with obligations) | Point of obligation | Free allocation of NZUs? |
|---|---|---|---|
| Forestry Pre-1990 | 1 January 2008 | Land owners or a third party who has the decision to deforest. | For pre-1990 exotic forests – 55 million units in total.<br>Between 2008 and 2012 – 21 million units.<br>Between 2013 and 2021 – 34 million units. |
| Forestry Post-1989 | 1 January 2008 | Land owners, holders of a forestry right and lease holders. | No free allocation |
| Stationary Energy | 1 January 2010 | Likely to be fuel suppliers | No free allocation |
| Industrial Processes | 1 January 2010 | Industrial producers | Trade-exposed industries may receive a free allocation of units representing 90% of 2005 emissions between 2013 and 2018. Between 2019 and 2029 the total number of units the Minister can allocate begins at eleven-twelfths of the number of units available for allocation in 2018. This then declines each year at a linear rate to equal one twelfth of this number in 2029.<br>Actual allocation has yet to be determined for individual firms. |
| Liquid Fossil Fuels | 1 January 2011 (early reporting from 2009) | Fuel suppliers | No free allocation |
| Agriculture | 1 January 2013 (early reporting from 2011) | Default at be dairy/meat processors. Farm level point of obligation is also possible.<br>Importers and manufacturers of synthetic fertiliser. | Between 2013 and 2018 the Minister can allocate a total amount of NZUs representing 90 units for each 100 tonnes of emissions that resulted from the activities 2005.<br>Between 2019 and 2029 the total number of units the Minister can allocate begins at eleven-twelfths of the number of units available for allocation in 2018. This then declines each year at a linear rate to equal one twelfth of this number in 2029.<br>Actual allocation yet to be determined. |
| Waste and other sectors | 1 January 2013 | Waste - Landfill operators | Waste – No free allocation.<br>Fisheries – Free allocation of 50% of 2005 emissions each year between 2011-2013 to fishing vessel operators to compensate for increased liquid fuel costs as a result of its inclusion in 2011. |

***Forestry***

Forestry is a relatively large contributor to the New Zealand economy. The forestry industry accounts for 10.4% of New Zealand's merchandise exports, approximately 3% of GDP and employers some 22,500 people and as of 2007 these figures were expected to grow (MfE, 2007a). The inclusion of the forestry industry in the NZETS is an important part of New Zealand's climate change mitigation strategy. As trees grow they absorb $CO_2$, removing it from the atmosphere. The Kyoto Protocol accounts for the role forests play in climate change mitigation by enabling forests planted in or after 1990 (commonly referred to as 'post-1989 forests') to earn forest sink credits called 'removal units' (RMUs). Post-1989 and pre-1990 forests are treated differently under the Kyoto Protocol because the Protocol established targets around a 1990 base level. So called 'Kyoto forests' are forests planted on non-forest land after 1989. The amount of RMUs awarded are calculated by subtracting deforestation 'emissions' from afforestation removals, New Zealand is expected to be a net beneficiary in this regard and may use RMUs to offset other emissions.

Deforestation activities are described as emitting activities for a number of reasons. First, the removal of a tree through deforestation prevents it from absorbing any more $CO_2$, this creates emissions in a 'removals forgone' sense. This is compounded when the land is then used for other activities, especially emitting activities like agriculture. Second, wood that is burned releases the $CO_2$ stored in the trees back into the atmosphere. Third, the harvesting process itself produces wood that is not used and is left to decay. This also releases the $CO_2$ stored in the wood. Deforestation and land use change accounts for some 20% of world GHG emissions (MfE, 2007a).

Deforestation of pre-1990 exotic forests has been substantial in New Zealand, and is expected to increase under a BAU scenario (MfE, 2007a). It is expected that this deforestation may contribute 41 million tonnes of CO2 (approximately 10.5%) to New Zealand's total emissions during CP1.[6] Deforestation of indigenous forests has been much less significant, and is expected to remain low unless commercial incentives increase substantially.

In line with the Kyoto Protocol, the NZETS also separates forests into 'post-1989' and 'pre-1990' forests. Lough and Cameron (2008) argue that this is primarily for fiscal purposes, for example, awarding NZUs to activities that did not earn Kyoto units would come at a direct fiscal cost to the government. Pre-1990 forest owners will only have emissions obligations under the ETS if they engage in deforestation and convert the land to a new use. Owners of pre-1990 forest must report annually any deforestation that occurs, calculate the resulting emissions and surrender the appropriate number of units. Foresters who deforest their land will be exempt from obligations as long as the deforestation is temporary (for instance, deforestation that takes place during the harvesting process) and the forest is replanted in within a specified time. Section 179(1) of the Act deems what activity constitutes 'deforestation'; a hectare of land has been deforested if the forest on that land has been cleared, and four years after the clearing, the hectare has not been replanted with at least 500 stems of forest species or if no forest of more than 500 stems of forest species has naturally been established. The Act also

[6] New Zealand's total emissions during CP1 are projected to be 391.5 million tonnes of $CO_2$-e (MfE 2008).

specifies that has been deforested if, 10 years after clearing, predominantly exotic forest species are growing, but the hectare lacks a tree crown cover comprising of at least 30% from trees that are 5 metres tall or higher. Indigenous forests are similarly governed but they have until 20 years after clearing to reach the aforementioned thresholds. The liability for each type of deforestation will be calculated individually, having regard to the age and species of the trees cleared (s179(2)). Owners of pre-1990 forests that are less than 50 hectares will be able to apply to be exempt from the scheme under s183, provided that no units have been allocated with respect to the land under s71, and all pre-1990 forest owners will have a 2 hectare deforestation allowance for the duration of the CP1 (and any subsequent five year period).

These exemptions are deemed necessary so that compliance and administrative costs do not outweigh the benefits generated by the scheme (Ministry of Agriculture and Forestry, 2007). The chief executive of the MAF is entitled under s184 of the Act to give exemptions in relation to the deforestation of pre-1990 forest land if the species growing on the land is a specified type of tree weed and no units have been allocated with respect to the land under s71. 'Tree weeds' are defined under s184(9) of the Act as trees that are pests listed in a pest management strategy under the Biosecurity Act 1993, trees that are 'tree weeds' as listed in regulations to the Act or tree that have naturally regenerated.

**Table 6: Deforestation activities**

| Type of forest | A hectare of land is 'deforested' when – |
|---|---|
| Any forest | a) Four years after clearing, the land has not been replanted with at least 500 stems of forest trees.<br>b) Four years after clearing, the land does not have a naturally established covering of at least 500 stems of forest trees. |
| Exotic forest | 10 years after clearing, predominantly exotic forest species are growing, but the hectare lacks a tree crown cover that comprises of a least 30% from trees five metres of taller. |
| Indigenous forest | 20 years after clearing, predominantly indigenous forest species are growing, but the hectare lacks a tree crown cover that comprises of a least 30% from trees five metres of taller. |

***Source:*** **Section 179 of the Act**

Post-1989 forest owners will not be required to enter the NZETS, but may do so voluntarily under s187 and s188 of the Act. This is to recognise that participating in the NZETS will not necessarily benefit all forest owners, particularly some owners of small forests (Lough and Cameron, 2008). Parties that choose to enter the scheme will have obligations relating to the net carbon stocks of their forests. If these stocks increase they will be awarded units, if they decrease they will have to surrender units. If post-1989 forest owners choose not to enter the scheme the government will retain credits earned from those forests and will be responsible for liabilities incurred.

The forestry sector entered the NZETS on 1 January 2008. The Labour-led government sought to bring this date as far forward as it could, as the Crown faced liabilities of between $180 million to $600 million (depending on the price of international emissions units) for each year that the forestry sector was excluded after this date. Policies to reduce

deforestation are seen as one of the most cost effective measures available in the near future for reducing emissions in New Zealand. Requiring foresters to bear the full cost of their emissions at an early stage is important both to ensure that deforestation is reduced and reduces compliance costs. The Labour-led government had been signalling its intention to impose deforestation controls since 2002, and its position was made clear in a number of consultation documents that followed. For this reason, most forestry stakeholders engaged in deforestation projects in the years immediately preceding 2008 had ample time to prepare for controls to be imposed on deforestation. A transitional measure has been provided for, however, in s196. Participants will not be required to submit an annual emissions return for the year ending 31 December 2008, but will have to submit one for the year commencing 1 January 2009 and ending 31 December 2009.

In general, the point of obligation lies with the owners of the land on which the forest grows. However, this obligation may be transferred to a third party if they have the had the decision to deforest vested in them. The criteria for the transferral of obligations are established in s180(1). The landowner must establish, to the satisfaction of the chief executive, that the right to decide to deforest was vested in a third party and that the landowner had no control over the decision. Section 180(3) makes it clear that, to avoid confusion, only landowners or third parties in the aforementioned category will be treated as carrying out an activity under Part 1 of Schedule 3 (deforesting pre-1990 forest).

The Labour-led government decided to grant a free allocation of NZUs to owners of pre-1990 exotic forests. The allocation will involve a total of 55 million units that will be allocated among landowners (Ministry of Agriculture and Forestry, 2007). Of these, 21 million units will be allocated in CP1 and 34 million will be allocated during 2013-2021 (see s71(b)). This is intended to recognise the economic loss suffered by forestry owners whose land values and profitability has fallen as a result of their obligations under the NZETS. It recognises the forest owners' lost opportunity to profitably convert their forests to other land uses. The 2008 draft allocation plan for forestry set out how units would be allocated to owners of pre-1990 forests

**Table 7 Allocation of units to pre-1990 forests**

| Category | Allocation |
|---|---|
| Eligible Crown forest licence land that was or will be transferred to an iwi under a treaty of Waitangi settlement after 1 January 2008. | 18 NZUs per hectare. |
| Land that was transferred to an eligible land owner on or after 1 November 2002. Land transferred to a body corporate prior to 1 November 2002 but where the changes in ownership since that date greater than 51%. | 39 NZUs per hectare. |
| All remaining NZUs from the 55 million unit forestry pool will be distributed equally on a per hectare basis across all other eligible land owners. | Approximately 60 NZUs per hectare. |

***Source*: MAF (2008)**

Afforestation is expected to increase as a result of the NZETS. There are incentives for forestry owners to act so as to reduce their NZETS obligations, thus increasing carbon stocks. It is expected that the NZETS will provide foresters with incentives to plant new forests on agricultural land where the expected value of the forest is likely to be greater than that of continued agriculture (especially in the case of sheep and beef). However, such land use change will be determined by international markets for timber, carbon and relevant meat prices (Cawthron, 2008). It is important to note that a reduction in the conversion of forest land to agriculture has a double benefit. Not only does the forest act as a carbon sink, but emissions from agriculture are also avoided (Cawthron, 2008). An increase in afforestation will have a number of spillover environmental benefits. These benefits included improved water quality and biodiversity in stream systems and reduced river erosion (Cawthron, 2008).

The NZETS is complemented by two main policies. The first of these is the Permanent Forest Sink Initiative (PFSI), enshrined in Part 3B of the Forests Act (1949). The PFSI enables landowners of planted forests to earn Kyoto units (AAUs) for establishing permanent forest sinks. This entails restrictions on harvesting and a permanent covenant registered between the Crown and the landowner for a minimum of 50 years (Ministry of Agriculture and Forestry, 2007).

The second is the Afforestation Grant Scheme (AGS). The AGS enables landowners to receive a government grant for planting forests on previously unforested land or assisted reversion of indigenous forests. Under the scheme, participants own the forests and can earn income from the timber produced. However, the Crown retains the sink credits and takes responsibility for meeting harvesting and deforestation liabilities (Ministry of Agriculture and Forestry, 2007). This scheme is expected to have lower compliance and transaction costs than the ETS for small forest owners.

***Agriculture***

New Zealand's agriculture industry has long been a key component of the New Zealand economy. New Zealand's stable and temperate climate has enabled an economy to be built around efficient primary production. Agriculture exports account for some 47% of total export income and around 53% of total merchandise exports. New Zealand is a leading player in the world dairy industry, producing approximately 40% of the world's tradable dairy products and in the order of 66% of the world's tradable lamb products (AgResearch). Agriculture contributes around 10% of New Zealand's GDP and is a significant employer.

The agriculture sector is New Zealand's largest single emitter and makes up approximately 49% of total GHG (AgResearch, 2008). Methane is the main GHG emitted from agriculture and this gas makes up 35% of New Zealand's gross total GHG emissions. Nitrogen oxide is also mainly produced through agricultural processes and amounts to 17% of total gross emissions (MfE, 2007f). Agriculture emissions are closely tied to the numbers of livestock being farmed. In the period from 1990 to 2003 methane emissions grew at an average of 0.4% per year. However, over this period, emissions from dairy cattle increased by approximately 52.3% as the intensity of dairy farming increased. During the same period emissions from sheep fell by 18.9%, as the sheep population reduced by over 30%. Nitrogen oxide emissions grew by 2.0% per year over

this period, mainly due to a significant increase in the use of synthetic nitrogen fertiliser and increased dairying. Of particular note is the methane emissions produced through enteric fermentation, a digestive process of ruminant animals. Methane produced as a result of enteric fermentation accounts for 31.3% of New Zealand's total emissions. This is significantly higher than other OECD countries (inducing Australia and Ireland) and is reflective of increased dairy farming.[7]

As previously noted, these statistics give New Zealand an unusual 'emissions profile' when compared to other Annex I (developed) nations. For example, Ireland, a country typically seen a being a comparatively similar country to New Zealand, has only 18.4% methane emissions and 14.2% nitrogen emissions. Australia also has relatively substantial methane emissions, amounting to 23.8% of its total emissions. This gap widens when New Zealand is compared to other developed nations; the European Union has methane emissions of only 8.5% of total GHG emissions and nitrogen oxide emissions of 7.9%. In Canada methane emissions are 12.9% of total GHG emissions and in the United States 8.6% (UNFCCC, 2003).

The implication of these statistics is that New Zealand needs climate change policy tailored to fit its unique emissions profile, especially in relation to the agricultural sector. Following the policies of other developed countries whose agriculture emissions make up a comparatively small part of their gross emissions would be unlikely to produce effective policy in the New Zealand context. If New Zealand intends to take effective action to reduce emissions it is imperative that the agriculture sector is included in the NZETS. The CEO of AgResearch, Dr Andrew West, described New Zealand as the only developed nation needing to focus as much on the countryside as on cities in its action on climate change (AgResearch, 2008). It is also necessary for New Zealand to invest in research and development in order to reduce agricultural emissions. Research into agricultural emissions is a low priority in most developed nations as they account for only a small part of these countries' emissions. In developing countries where agricultural emissions are typically high, research into reducing such emissions is also a low priority because governments are more concerned about increase economic growth and standards of living. New Zealand has the opportunity to develop world-leading technology to reduce agricultural emissions. Indeed, many of these technologies are already in the process of being developed, such as rumen microbial ecology, rumen microbial genetics, anti-methanogen vaccines, selective breeding, nitrification inhibitors and feed designed to produce lower emissions (AgResearch, 2007).

Many claims have been made that emissions reductions will be difficult or prohibitively costly in the agriculture sector. For example, Castalia (2007) argue that there is no reason to expect that the agriculture industry will be able to reduce its emissions following its inclusion in the NZETS and that significant agricultural abatement is not possible without reducing output. However, Bertram and Terry (2008) cite a study prepared for the government by ICF International that casts doubt on these claims. The report found that agriculture could provide substantial and immediate low-cost emissions reductions, and that these reductions could be made a at profit for the farmer at emissions prices under $30/t.[8] This indicates that reducing emissions in the agriculture sector should be further

[7] For data see http://www.mfe.govt.nz/publications/climate/policy-review-05/html/page3-1.html (last accessed 14/1/09).
[8] See chapter 8.2 of Bertram and Terry (2008) for further information.

explored as a key area for reducing New Zealand's total emissions and suggests that the government may have been too hasty in writing off the agriculture industry as a major area for emissions reductions.

Under the NZETS agricultural participants can choose to report their emissions voluntarily in 2011, and are required to report their emissions in 2012 but they will not have to pay for their emissions until 2013. Because of its 'competitiveness at risk' status, agriculture does not have to bear the full costs of its emissions until 2030. It could also be argued that this delay in responsibility is an indication of the political power of the farming lobby in New Zealand. Until then, a proportion of the agriculture sector's emissions will be covered by the free allocation of NZUs from the government. This is particularly important for farmers, who typically bear the burden of agricultural cost increases (MfE, 2007a). Section 76 of the Act sets out the process for the allocation of NZUs to the agriculture sector. The relevant Minister is required to create an allocation plan effective from 1 January 2013 but expiring no later than 31 December 2029. This allocation system is prescribed by s76(2)(b) and s76(2)(c) of the Act. For an allocation plan that is in force between 1 January 2013 and 31 December 2018 the Minister will be able to allocate a total amount of NZUs representing 90 NZUs for each 100 tonnes of emissions that resulted from the activities listed in Part 5 of Schedule 3 in 2005. For an allocation plan that is in force in any year between 1 January 2019 and 31 December 2029, the total number of units available for the Minister begins at eleven-twelfths of the number of units available for allocation in 2018. This then declines each year at a linear rate to equal one twelfth of this number in 2029.

The point of obligation – that is, the stage in the production chain that will be required to monitor, report, and surrender units in respect of emissions produced – has yet to be finalised for the agriculture sector. In respect of the use of synthetic fertilisers, it is likely that the point of obligation will be imposed high in the supply chain on nitrogen fertiliser suppliers (importers and producers). However, the points of obligation options for methane producing activities remain open. The two most likely are setting the point of obligation on farmers or on dairy/meat processors, with a processor level more likely. The view of officials is that the point of obligation does not need to be placed on the emitter directly, as the price signal created by the NZETS will move through the supply chain (MfE, 2007a). The former Labour-led government identified four key criteria to be used when assessing potential points of obligations (MfE, 2007a), namely:

- Administrative and compliance costs
- Coverage of emissions and emitters
- Feasibility of monitoring
- Incentives to reduce emissions.

There are two competing rationales here. It is desirable to set a point of obligation that has low administrative and compliance costs since this reduces inefficiency and ideally ensures a smooth functioning of the system. Low costs are most easily achieved by minimising the number of participants at the point of obligation. It is far less costly to monitor the obligations of 25 processors than to monitor tens of thousands of farmers. However, this is in tension with a need to create incentives to change behaviour at the sources of emission production. It is arguable that such a goal is best achieved by placing the point of obligation on the actual emitters, rather than further down the supply chain. The former Labour-led government's preferred point of obligation for methane producing

activities appeared to be at the processing stage as the Government's desire was to minimise the number of participants (MfE, 2007a). However it is likely that there will be significant consultation with the agriculture industry on the location of the point of obligation before the final decisions are taken and regulations drafted.

***Stationary Energy***

The stationary energy sector includes all fuels used for electricity generation and the direct production of power and heat in the industrial, commercial and residential sectors (MfE, 2007a). However it does not include emissions from liquid fuels used primarily in transport or emissions from industrial processes (both are covered elsewhere in the NZETS).

New Zealand has a high proportion of renewable sources of electricity generation, amounting to about 70% of total generation, one of the highest in the world. This contributes to New Zealand's unusual emissions profile where emissions from energy make up about half of what they would in most other developed nations. However, these emissions have been rising; emissions from electricity generation rose by 138% between 1990 and 2006 - a result of an 879.4% increase in emissions from coal generation over this period (Ministry of Economic Development, 2007). Emissions in this sector are mainly $CO_2$, with some methane produce in geothermal generation.

Stationary energy is to be included in the NZETS from 1 January 2010. The former Labour-led government argued that this delay was justified on the basis of a relatively large number of participants and a need to engage in further consultation as to the point of obligation (MfE, 2007a). The point of obligation will lie with fuel producers with energy producers having the option to opt-in to the scheme, if the energy producers opt-in to the scheme, s212 removes the obligations of the fuel producers. The Labour-led government expressed a preference to have the point of obligation at that most upstream level of the supply chain. This would include coal, geothermal and gas extractors and importers. A number of exceptions are expected to be granted. They will include exported emissions sources, emissions sources used for non-fuel purposes and coal-seam methane that is not being sold.

Electricity prices are expected to rise following the introduction of stationary energy into the NZETS framework. This, combined with increased costs of non-renewable generation, is expected to lead to an increase in the use of renewable generation, improvements in energy efficiency (for example, the purchase of more energy efficient appliances), an increase in household generation (for example, the use of solar panels for hot water heating), and a general reduction in electricity demand as consumers are encouraged to engage in more energy-saving behaviour such as turning off lights, taking shorter showers and using less heating.

The stationary energy sector is not being allocated free units; participants will have to buy units from the market or from the government. The former Labour-led government argued that allocation of free units would not prevent higher prices being passed on to consumers (MfE, 2007a). Renewable electricity generation is not included in the NZETS, it is expected that renewable energy generators to gain indirect benefits from the NZETS as a result of higher wholesale electricity prices.

Accompanying the NZETS legislation was the Electricity (Renewable Preferences) Amendment Act. This legislation places a restriction on the building of new thermal electricity generation. This is intended to move New Zealand towards a target of 90% renewable energy generation by 2025. A higher proportion of renewable energy will require greater excess capacity to account for environmental variation and uncertainty (for example, an unusually dry year). There is an indication that the costs of excess capacity increase significantly once the renewable generation exceeds 90% (Ministry of Economic Development, 2007), but that until this point these costs are likely to only be moderate (Cawthron, 2008). Cawthron's report identifies potential adverse consequences of an increase in renewable energy. These effects could include loss of land value from wind turbines, localised loss of biodiversity near geothermal sites and a loss of biodiversity and water availability from new hydropower sources (Cawthron, 2008). The National-led government formed following the 2008 General Election has repealed this legislation.

The Ministry for the Environment predicts only moderate emissions reductions from stationary energy in the shorter term, but that a price of $15/t to $25/t could halt the growth of emissions from electricity generation in the longer term (approximately 2020) (MfE, 2007a). The Framework document identified the need, and the desire, to implement complementary policy to reduce electricity demand, such as incentives for consumers to purchase more energy efficient appliances or better household insulation.

***Liquid Fossil Fuels (transport)***

New Zealand has a heavy reliance on liquid fossil fuels. This reflects the country's high level of car ownership, long, narrow geography, low-density urban areas and relatively poor public transport. New Zealand also requires liquid fossil fuel to transport exports to distant markets either with ships or aircraft. Total emissions produced by national and international transport increased by 58.3% between 1990 and 2006 (Ministry of Economic Development, 2007) with road transport being a significant driver. Emissions are expected to rise by about 35% by 2030 on a BAU scenario.

Under the 2008 legislation liquid fossil fuels will be included in the NZETS from 1 January 2011 with early reporting from 2010. Previously it had been proposed that liquid fuels be introduced from 1 January 2009 but the start date was delayed two years on the recommendation of the Finance and Expenditure Committee for the purpose of reducing inflationary pressures caused by high oil prices. New Zealand imports the majority of its oil and is heavily impacted by changes in the international market. This market is often volatile and the price of oil can change frequently and significantly. At the time when the Select Committee and the House were considering delaying the introduction of liquid fossil fuels into the scheme, oil prices were nearing the highest levels, in real terms, in decades. Politically, this was a good decision, implementing a policy adding to the already high price of petrol would have been unpopular. However, within months of the Act being passed into law oil prices had plummeted to some of the lowest levels seen in recent history. This shows not only the volatility of the market but also illustrates the risk in sacrificing climate policy for short-term political pressures. Ironically, the relatively low petrol prices in early 2009 would have provided a good basis for introducing liquid fossil fuels into the NZETS at that time.

Fuels covered under the NZETS include petrol, diesel, aviation gasoline, jet kerosene, light fuel oil and heavy fuel oil. Only fuels used domestically are covered; fuels used for international transport will be exempt, as will lubricating oils. The exemption of international transportation fuels was seen by officials as important given the high use of maritime transport to ship exports and a significant tourism industrial mainly involving aviation transport. These fuels are also not yet covered by Kyoto. Liquefied petroleum gas used for transport will be included under stationary energy. The preferred point of obligation is at a high level in the supply chain as this provides wide coverage for limited administrative and compliance costs. The point of obligation has been set on those removing fuel from a refinery for domestic use; this includes the five oil companies in New Zealand: BP, Caltex, Gull, Mobil and Shell. It is possible that jet fuel users will be able to opt-in to the scheme.

The NZETS does not provide for a free allocation of units to the transport sector. It is suggested that the free allocation of units would not prevent price increases reaching consumers (MfE, 2007a). A free allocation of units may instead produce windfall profits for the fuel companies, without producing incentives to change behaviour.

The Cawthron Institute notes that it is better to analyse transport in a functional sense, rather than simply looking at modes of transport. For instance, air travel can be broken down into business travel and personal travel. This is a useful analysis; breaking activities down into small, functional or location-based markets with defined elasticities can provide greater depth in the study of sectoral effects. New Zealand has typically been thought to have a relatively 'inelastic' (that is, price unresponsive) demand for transport fuel. Direct research on this has been limited in New Zealand. However, the studies have been done showing that an increase in fuel prices would produce a modest reduction in both traffic volume and fuel consumption (see Cawthron, 2008, quoting the Land Transport Safety Authority). A fall in medium-to-long-term demand of 3% per 10 cent increase in the price of a litre of petrol is suggested in the *Framework*. Cawthron suggests that fuel prices are likely to rise when liquid fossil fuels are include in the NZETS and this is likely to produce a small decrease in emissions from the transport sector. The Sustainability Council of New Zealand suggests that emission reductions from transport will be very low (Bertram and Terry, 2008). With a carbon price of $30/t it is predicted that the NZETS will reduce transport emissions by only 0.7%. The Ministry for the Environment suggests similar figures, a 0.3% reduction at a carbon price of $15/t and a 0.6% reduction at $25/t (MfE, 2007a). It is important to note that these figures were calculated on the premise of liquid fossil fuels being included in the NZETS in 2009 but this has been delayed until 2011 – no doubt making the emission reduction based on these calculations even less.

Other policy will also be put in place including incentives to move towards small cars with better fuel economy and better standards of driver training. The fuel economy measures involve the labelling of new and used vehicles with labels indicating their fuel efficiency in order to enable consumers to make a more informed choice. This could include a 'fuel efficiency' standard imposed on car dealers. The Ministry of Transport has also undertaken a number of other initiatives, including creating a website on fuel efficiency which enables consumers to calculate the fuel efficiency of their vehicles.[9]

[9] www.fuelsaver.govt.nz (last accessed 14/1/09)

***Industrial processes***

The industrial processes sector includes non-energy emissions created through the chemical transformation of material from one substance to another. Emissions from New Zealand's industrial processes sector represented 5.6% of total GHG emissions in 2005 (MfE, 2007a*)*. Those emissions increased 31.8% from 1990 to 2005. There are five main industrial processes that are identified significant $CO_2$-e emitters (MfE, 2007a):

- Reduction of ironsand or recycled steel in steel production
- Oxidation of anodes in aluminium production
- Calcination of limestone for use in cement production
- Melting of soda ash in glass production
- Calcination of limestone for lime.

The industrial processes sector also produces a number of other GHGs that are included in the NZETS; they include perfluorocarbons (PFCs) from aluminium smelting, hydrofluorocarbons (HFCs) used as substitutes for ozone-depleting substances, PFCs from refrigerants, and sulphur hexafluoride ($SF_6$) from electrical switchgear (MfE, 2007a).

Under the 2008 legislation, the date of entry for industrial process emissions into the NZETS will be 1 January 2010. However, emissions of all synthetic gases will be exempt until 1 January 2013 because of a 2004 memorandum of understanding between the Crown and major users agreeing that the latter were to be exempt from any climate change policy costs in return for meeting a specified target.

The Labour-led government proposed assistance to trade-exposed industries for increased costs caused by the NZETS both directly and indirectly (such as increased electricity costs). Under the 2008 legislation this will take the form of a free allocation of units representing 90% of 2005 emissions. The threshold for allocation and allocations will be specified in allocation plans. Bertram and Terry (2008) are critical of this proposed allocation. They argue that industry will receive more free units than their projected emissions, leaving them with surplus units and a windfall gain (Bertram and Terry, 2008).

***Waste***

It is estimated that the waste sector produces 2.4% of New Zealand's total GHG emissions (MfE, 2007a). However, the waste sector has reduced its emissions by 26% from 1990 levels as a result of better landfill management, increased recycling and composting, and the rapid uptake of landfill gas recovery technologies (MfE, 2007a). Solid waste disposal is the main emitting activity in this sector. Methane emissions are created through bacterial the decomposition of organic material. The volume of emissions is dependent on a number of factors, such as disposal methods, moisture and temperature. Participants in this sector will only comprise of landfills that dispose of organic material (MfE, 2007a).

The NZETS will only include the main gas produced by the waste sector, methane. It was decide that emissions of methane and nitrous oxide produced by wastewater treatment would not be included in the scheme. Despite accounting for approximately 0.5% of total

emissions, emissions from individual wastewater facilities are difficult to measure and such facilities are numerous. It was calculated that the costs of administering these emissions within the scheme outweighed the benefits that could be achieve from their inclusion (MfE, 2007a). Emissions from solid waste incineration are also excluded from the scheme, as there are no significant emitting solid waste incineration operations in New Zealand. However, there are indications that this may be revised if a major incineration operation is established (MfE, 2007a).

The waste sector will not be included in the NZETS until 2013 but will have early reporting from 2011. This is due to the passing of the Waste Minimisation Act 2008, part of the Labour-led government's broader sustainability programme. The Waste Minimisation Act imposed a levy on all waste disposed in landfills and is designed to reduce waste. The levy is designed not only to change behaviour as a price mechanism, but also to create funds for better waste management. It was decided that it would be inappropriate to impose two environmentally based price mechanisms on the sector and that its obligations under the NZETS should therefore be delayed. It is noted that the levy may be enough on its own to cause a sufficient reduction in emissions. If this is the case, the waste sector's inclusion in the NZETS may be further delayed (MfE, 2007a).

The point of obligation for this sector is likely to lie with landfill operators. The methods to be used for calculating emissions have yet to be determined, and will to be created in consultation with participants in the years leading up to the inclusion of the waste sector in the NZETS. The Labour-led government indicated that no free units would be assigned to this sector.

**Units of trade and international linkages**

Under the 2008 legislation New Zealand Units (NZUs) will be the primary unit of trade under the NZETS. NZUs will be issued and allocated by the government and will be able to be traded by any person. NZUs do not have an expiry date and will be available for use in future commitment periods. However, at this stage it is unlikely that participants will be able to until some resolution is given to the uncertainty surrounding post-2012 arrangements. Each NZU represents one tonne of $CO_2$-e and is backed by an AAU; this is designed to create an international market for NZUs. It is intended that NZUs be fully compatible and interchangeable with AAUs and to enable holders to use the Registry to exchange their NZUs for AAUs that can then be sold overseas (MfE, 2007a). NZUs can be used by participants to meet their obligations under the NZETS. Participants may also surrender some approved overseas Kyoto units. However, s18CB, subject to regulations, restricts the surrender of the imported AAUs during CP1.

There has been debate as to whether New Zealand needs its own emissions unit. Some believe a New Zealand specific unit is unnecessary and problematic. The nature, design and definition of the four Kyoto units are relatively clear and well understood; the introduction of an NZU may lead to confusion as to where it fits in relation to the well-established Kyoto units, particularly in an international context. Kyoto units are also directly required to meet New Zealand's Kyoto obligations. The use of Kyoto units in the NZETS may give greater consistency and familiarity to those purchasing and trading units within the scheme.

In its report on the NZETS, the New Zealand Sustainability Council highlighted three potential issues with a market for NZUs (Bertram and Terry, 2008). The Council argued that unit holders may prefer to hold the more internationally 'hard' Kyoto units, resulting in a 'flight' from the NZU (the authors argue the complexities of the market for NZUs will cause them to be priced differently to Kyoto units). In this case, it is suggested, the government may either have to declare the NZU to be inconvertible for Kyoto units or devalue the NZU against the Kyoto units to entice buyers. This may lead to a 'fixed exchange rate' style of management, where the government is forced to buy Kyoto units to make up for an excess supply of NZUs. Secondly, the integrity of the NZU may be undermined by inflationary pressures created by an over issue of units (of course this can be avoided by sound issuance management). Finally, it is argued that there is a risk that New Zealand's large energy supply companies will manipulate the market for NZUs. It is suggested that these factors will lead to uncertainty and economic inefficiencies. The price of NZUs is likely to be determined by the price of the lowest quality Kyoto unit – NZUs will only be brought if they are cheaper than the readily substitutable Kyoto units.

However, there would be drawbacks on the sole use of Kyoto units in the scheme. There are issuance and banking restrictions on Kyoto units during CP1, particularly for the forestry sector (as discussed below) and the status of Kyoto units after 2012 is uncertain and depends on future international negotiations.

Sin and Kerr and Hendy (2005) note that greater transaction costs are likely to flow from more complex systems of permits that are not well understood by stakeholders. This may reduce trading, transparency and make enforcement difficult. The authors acknowledge, however, that if there are only a small number of (typically sophisticated) participants required to hold permits then the complexity of the system will have less of an effect. It appears this may be the case with the NZETS. Excluding forestry (which may involve as many as 9,000 participants) the NZETS is expected to have approximately 170 firms serving as points of obligation (MfE, 2007a).

An integral part of the NZETS is the New Zealand Emission Unit Register (NZEUR), administered by the Ministry of Economic Development. The register is fully electronic and will track and record transactions and the holding of Kyoto units. This includes the government, companies and private individuals. The NZEUR will be linked to the United Nations administered International Transaction Log. The NZEUR will hold New Zealand's Commitment Period Reserve (CPR). The CPR is the requirement under the Kyoto Protocol that requires parties to hold a minimum number of Kyoto units (not NZUs) in its registry at all times – for New Zealand this is 90% of its total AAUs. The goal of the CPR is to ensure that parties can meet their targets by preventing them from overselling their AAUs. The NZEUR will be used by parties to hold and transfer NZUs and Kyoto units and, subject to restrictions, the holders of NZUs will be able to exchange them for Kyoto units through the registry.

**Administration and Enforcement**

Under the 2008 legislation, the NZETS is administered by both the Ministry of Economic Development and the Ministry of Agriculture and Forestry. The Ministry of Economic Development is responsible for the operation of the NZEUR and is responsible for overseeing the ownership, transfer and surrendering of emissions units.

The Climate Change Response (Emissions Trading) Amendment Act is administered by the Ministry for the Environment. It is responsible for the development of allocation plans and regulations under the Act relating to the act generally and all but one of the sectors involved. The Ministry of Agriculture and Forestry is responsible for administering forestry and agriculture regulations and allocations under the Act.

The Act provides penalties for failure to accurately report emissions and allows the administrator of the scheme to assess and audit emissions reports. These are important measures as the scheme involves self-assessment of emissions levels, similar to many income tax systems (Motu, 2008).

## Economic and Environmental Effects

### *Macroeconomic Effects*

A number of different organisations have modelled the possible macroeconomic effects that may result from the introduction of the NZETS. Much of this modelling was done in the consultation stage and before some changes had been made to the legislation (for example, the delaying the introduction of liquid fossil fuels into the scheme until 2011). However, the models still remain useful in giving a general economic picture.

Government officials identified two key considerations when assessing the effect the NZETS will have on the New Zealand economy (MfE, 2007a). They are:

a. The international price of emissions (derived from the stringency of international agreements)
b. Whether New Zealand is able to reduce emissions in a least cost manner, and whether New Zealand is able to help other countries do this (to gain Kyoto credits).

Modelling undertaken by the Australian Bureau of Agricultural and Resource Economics (ABARE) for the New Zealand Government's 2005 review of climate change policy indicated that a scheme similar to the NZETS (including agriculture and international linkage) with a carbon price of US$13/t $CO_2$-e would reduce GDP by 0.04% in 2010 relative to BAU levels. In 2006, Infometrics modelled the effect of a NZ$25/t $CO_2$-e carbon tax on the New Zealand economy, found that 2011/2012 GDP would be reduced by no more than 0.1%. It is important to note that a reduction in GDP relative to BAU levels does not mean GDP will be 0.04% (for example) less than GDP today. Rather, it means that GDP in 2010 will be 0.04% less than it would otherwise have been at that time.

Modelling carried out by the New Zealand Institute for Economic Research (2008) predicted a 0.5% fall in GDP by 2012 and a 2.1% fall by 2025. This was compared with a 'New Zealand pays' scenario where the government pays its Kyoto commitments *sans* the NZETS. Under a 'New Zealand pays' scenario, GDP was predicted to fall by only 0.1% by 2012 and 0.7% by 2025 (NZIER, 2008). However, any prediction of a 'New Zealand pays' outcome post-2012 depends entirely on what international agreements are reached and what commitments New Zealand adopts, and as such is essentially undefined. Furthermore, the initial expense of the NZETS in comparison to a 'New Zealand pays' scenario is not unexpected; the NZETS is intended to be the basis of New Zealand's

climate change policy for decades to come, initial impacts and start-up costs arguably make the scheme appear more costly than it actually is. Notwithstanding this, NZIER's own modelling acknowledges that a 'New Zealand pays' scenario would not produce any domestic emissions reductions. Given this, an ETS is still the cheaper of the two options when it comes to reducing emissions.

A report produced by Castalia (2007) criticises what it sees as the key assumptions made by the government – that adjustment costs will be negligible, that New Zealand firms will be able to access carbon permits at low and stable prices and that the competitiveness of New Zealand firms will not be undermined. It is argued that adjustment costs will be high as the New Zealand economy has few options for reducing emissions and that most of our emissions-intensive industries are already operating at 'world's best practice' emissions level and technology does not exist to reduce agriculture emissions. However, there is evidence that significant emissions reduction can be made with relative ease in New Zealand's agriculture sector (Bertram and Terry, 2008). Further research and development in emissions reducing technologies is likely to more effective options for reducing emissions. It has been argued that New Zealand ought to be a 'fast follower' rather than a leader on climate change policy (The New Zealand Institute, 2007). However, it may not be enough for New Zealand to be a 'fast follower' on agriculture emissions simply because there is little to follow. If New Zealand is serious about reducing its emissions and meeting international commitments, methods of reducing agriculture emissions must be found and applied.

Castalia argues that the NZETS will cause the New Zealand economy to lose competitiveness in international markets. It is argued that a lack of international action will hurt New Zealand industries whose foreign competitors will not face similar emissions related costs. The Ministry for the Environment maintains that 'loss of competitiveness' arguments are often exaggerated. Castalia does not sufficiently acknowledge the significant protection given to both agriculture and trade exposed industry over the next two decades under the NZETS (as of late 2008). Castalia's argument that foreign nations are not taking action is also weak. While it is correct that many countries have yet to adopt emissions trading, it is not acknowledge that many of these countries intend to have trading schemes in place before the end of CP1, for example Australia and the United States (see below). It is likely that many countries will have similar trading schemes in place once protection is finally lifted on New Zealand's trade exposed industries and agriculture.

The Australian Treasury (2008) undertook an in-depth modelling of climate policy. They found that early global action was less expensive than later action. Furthermore, this finding also held even if other countries chose to defer action on climate change as those who delayed action faced higher long-term costs. This suggests that early action may be more economically beneficial than a 'fast follower' approach proposed by the New Zealand Institute (2007). The Australian Treasury's report concluded that under all modelled scenarios a market-based approach enabled 'robust economic growth into the future'. The report found that the reduction in the level of GDP in 2050 relative to the reference scenario used ranged from 3.7% to 5.8% in the various scenarios modeled, these figures are low given that Australian GDP is expected to be approximately three times larger in 2050 than in 2005. The report argued that large emissions reductions

could be achieved without a significant reduction in economic activity, as the economy will restructure in response to the price of carbon.

### *Microeconomic effects*

All economic effects will depend on the price of carbon, which, of course, fluctuates with international markets. Most models assess the effects of both a $15/t and $25/t price of carbon to account for this uncertainty. The Ministry for the Environment has outlined potential price changes that may occur from different prices of carbon under the NZETS (MfE, 2007a). A 3.7 ($15/t) or 6.1 ($25/t) cent increase in petrol prices per litre was predicted, as was 1 ($15/t) or 2 ($25/t) cent increase in retail electricity prices and the retail price of a $20 bag of coal was expect to increase by $0.90 ($15/t) or $1.50 ($25/t). The consequence of the above figures is likely to be a $100 (minimum prediction at $15/t) to $330 (maximum prediction at $25/t) increase in average household energy expenditure per annum. This amounts to a 0.3% to 0.8% increase in average household expenditure.

The agriculture sector is a price taker on the international market; this prevents it being able to pass on all cost increase to consumers. According to the Ministry for the Environment, the participation of the agricultural sector in the NZETS is important to maintain its international competitiveness, especially in light of movements such as 'food miles' in Europe.[10] Some modelling was done on how participation in the ETS would affect agriculture payouts in 2013, the figures are only indicative, not exact (MfE, 2007a). Dairy was the biggest loser with a fall from BAU payouts of 1% ($15/t) or 1.6% ($25/t). Beef and venison farmers' payouts are expected to fall by no more than 0.3% but sheep farmers may lose up to 1.2%. The price of nitrogen fertilizers is expected to increase by 7% in 2013 assuming a carbon price of $15/t.

The value of pre-1990 forests is expected to fall due to the cost of deforestation liabilities created under the ETS (although this will be offset in part by the free allocation of units to affected participants). However, the ETS will provide the owners of post-1989 forests and those wishing to afforest suitable land with a new source of income from their forests.

The report of the Australian Treasury on the economics of climate change mitigation (2008) found that the competitiveness of many of Australia's industries were likely to improve or remain the same given coordinated international action on climate change. The report found that carbon prices were unlikely to be high enough to induce significant relocation of industry and the allocation of free permits could ease the transition process in many industries.

[10] 'Food miles' refer to the distance which food (or any good) has travelled from the location of production to its point of consumption. The further food has travelled the more GHGs have been produced as a result of its transport.

***Environmental effects***

As of May 2008 New Zealand is expected to be in a Kyoto deficit of 21.7 million units during CP1 (this was revised down from an estimation of 45.5 million units made in 2007, this may be revised further in light of the economic recession). The previous Labour-led government made no strong prediction on how successful the ETS will be at reducing emissions and bringing New Zealand towards its Kyoto target. One model of a possible change in New Zealand's Kyoto liability is proposed which sees the Kyoto liability failing to 35 MtCO2-e from BAU levels of 45.5 MtCO2-e (if the government retains all afforestation credits for compliance during CP1) or 124.5 MtCO2-e (if the government fully devolves afforestation credits to landowners) (MfE, 2007a).

The *Framework* document concluded that it is difficult to predict the economic and environmental effects of emissions trading with any great certainty. However, international experience has suggested that emissions trading is effective at reducing emissions in a cost-effective manner. Bertram and Terry (2008) criticised the Ministry for the Environment for not performing an estimation of the emissions reductions that the NZETS would achieve. Bertram and Terry's own estimations concluded that the scheme would reduce emissions by less than 2% over the first Kyoto commitment period (note that this figure was calculated before the entry of liquid fossil fuels was delayed until 2011). This echoed the Cawthron's (2008) prediction that emissions reductions in New Zealand would be limited until 2013 when agriculture enters the scheme. However, like the Ministry for the Environment, Cawthron argued that it was difficult, if not impossible, to predict emissions reductions with any accuracy due to the number of other factors involved.

The NZIER predicted that the NZETS would produce a 2.6% reduction in emissions by 2012, a 6.4% reduction in 2015 and a 10.4% reduction in 2025. Their modelling did not predict any reduction in emissions in any period by virtue of a 'New Zealand pays' scenario (presumably there would be an actual increase in emissions i.e. BAU levels). The goal of climate change policy must be to reduce emissions as lowest cost, if the policy does not effect emissions it cannot be considered effective.

**Table 8: Modelling of Environmental Effects (GHG reductions)[11]**

| Sector | MfE *Framework* (2007) | Bertram and Terry (2008) | Cawthron (2008) |
|---|---|---|---|
| Electricity | BAU – increase in emissions<br>ETS Short term – 'moderate reductions'<br>ETS Long term – A price of \$15 to \$25/t $CO_2$-e would keep emissions at 'about current levels' | BAU over CP2 – 34 Mt $CO_2$-e increase.<br>CP1 ETS – reduction of 3.1 Mt $CO_2$-e (~9%) | Short term – emissions from coal are expected to fall and emissions from gas use and electricity generation are likely to increase.<br>Long term – reduction in emissions. |
| Transport | BAU – a 40% increase by 2030.<br>Price of \$15/t $CO_2$-e – 0.3% reduction from BAU levels.<br>Price of \$20/t $CO_2$-e – 0.6% from BAU levels. | BAU CP1 – 80 Mt $CO_2$-e increase.<br>CP1 ETS – reduction of 0.4 Mt $CO_2$-e (~0.1%). | Short term – slight decrease in emissions growth.<br>Long-term reductions – dependant on price of emissions and technology development. |
| Forestry | Reduction in deforestation and an increase in afforestation, leading to reduced emissions. | BAU CP1 – 20 Mt $CO_2$-e increase in emissions from deforestation.<br>ETS CP1 – 14.1 Mt $CO_2$-e reduction from avoided deforestation (although not all due to the ETS). | Reduction in emissions from reduced deforestation and increased afforestation (see agriculture). |
| Agriculture | Pre 2013 – Indirect emissions reductions from less conversion of forest land into farmland and higher stationary energy prices.<br>Post 2013 – Reduction relative to BAU. | BAU CP1 – 203 Mt $CO_2$-e increase.<br>CP1 ETS – no reduction. | Pre 2013 – Indirect savings of 21 Mt $CO_2$-e from avoided deforestation/conversion. However, delaying the introduction of agriculture until 2013 puts these benefits at risk.<br>Post 2013 – dependant on price of emissions and technology development. |
| Other | Industry – uncertain, but opportunities exist to reduce emissions.<br>Level of reductions dependant on price of emissions. | Non-transport liquid fossil fuel – BAU CP1 increase of 19 Mt $CO_2$-e. CP1 ETS – 0.5 Mt $CO_2$-e reduction<br>Waste and other –<br>BAU CP1 – 7 Mt $CO_2$-e increase.<br>CP1 ETS – no reduction.<br>Non-electricity stationary energy and industrial process –<br>BAU CP1 – 62 Mt $CO_2$-e increase.<br>CP1 ETS – 1.9 Mt $CO_2$-e reduction. | Industry – gradual reduction in emissions. Dependant on technology and behavioural change.<br>Mining – uncertain, possible gradual decline.<br>Waste – gradual decline from entry in 2013. |
| Total reduction | Reduction on BAU levels. | At most a 5.9 Mt $CO_2$-e reduction over CP1 (~2%) excluding deforestation. | Reduction on BAU levels. |

[11] These calculations are based off the Climate Change Response (Emissions Trading and Renewable Preferences) Amendment Bill and the details presented in *A Framework for a New Zealand Emissions Trading Scheme*.

## International comparisons

While the NZETS is globally the first ETS to include all sectors and all gases it is by no means the first or only such scheme in place. Moreover, a number of countries (and sub-national governments) are in the process of designing new schemes. A sample of ETS models from around the world is discussed below.

### *Europe*

In 2005 the European Union established the European Union Emissions Trading Scheme (EUETS), one of the world's first and largest mandatory emissions trading schemes. While not as sectorally comprehensive as the NZETS, the EUETS involves 25 countries, some 12,000 installations and 6 major sectors. The sectors covered included electric power, oil refineries, coke ovens, metal ore and steel, cement kilns, glass, ceramics and paper and pulp. It has been proposed that more sectors will be added, including domestic aviation from 2011, international aviation from 2012, some metal refining from 2013 and chemical industrial processes, also from 2013. Two notable exclusions are forestry and agriculture – both of which are included under the New Zealand scheme. Indeed, emissions units generated by forest sinks cannot be used under the EUETS because it is argued that their effectiveness is uncertain and that reductions from industry emissions are superior, although there have been some calls to ease this restriction. At this stage the EUETS only covers $CO_2$ emissions from stationary energy and industrial processes, not all GHGs (such as methane from agriculture) or all sectors (notably agriculture and transport). This is expected to be expanded to included nitrous oxide and perfluorocarbons from 2013.

### *Australia*

The Australian state of New South Wales established one of the worlds first emissions trading schemes, the Greenhouse Gas Abatement Scheme (GGAS), on 1 January 2003. This was expanded into the Australian Capital Territory on 1 January 2005 with aim of reducing GHG emissions in the electricity sector. The scheme set a mandatory benchmark for buyers and sellers of electricity based on their share of electricity demand. This is met by surrendering 'abatement certificates' created by project based emissions reduction activities. If a benchmark participant fails to surrender enough certificates to meet it benchmark it must pay a penalty of AU$12.00 per tonne of the shortfall in emissions (GGAS 2008).

Australia has been slow in adopting international agreement on climate change, only ratifying the Kyoto Protocol in 2007. However, since then, climate change policy has been moving with some pace. Australia's proposed response to climate change has been envisioned in the Carbon Pollution Reduction Scheme (CPRS) green paper released in July 2008. The Australian government has favoured an ETS over a tax because it believes emissions trading better focuses on environmental goals by controlling the quantity of emissions directly (Department of Climate Change, 2008). The Australian government also believes that emissions trading is more consonant with international climate change policy and that such schemes provide a better mechanism for enabling firms to manage

uncertainty. Legislation for the CPRS is expected to be introduced in May 2009 and enacted later in the year.[12]

The CPRS shares similarities with the NZETS. It is a cap and trade scheme that is planned to commence in mid 2010. The CPRS seeks to create a wide-reaching scheme encompassing from the outset sectors including stationary energy, transport, fugitive emissions, industrial processes, waste and forestry – unlike the NZETS, it is not envisioned that the introduction of sectors will be staggered (although agriculture may enter the scheme in 2015). Forestry under the CPRS is treated differently to the NZETS; under the CPRS participation will only be voluntary with forest owners being able to 'opt in' to the scheme – however, this will only included post-1989 'Kyoto' forests. Deforestation activities are excluded from the CPRS as it is argued that deforestation in Australia has already been reduced significantly since 1990. Unlike the NZETS agriculture is not included in the CPRS; a final decision is to be made on the inclusion of agriculture by 2013 and it is recommended that agriculture not enter the scheme before 2015. Many other areas of the CPRS are similar, an Australia Emissions Unit (AEU) will be created, free units will be allocated to trade exposed industries, assistance given to strongly affected industries and all Kyoto gases will be included.

Entities will be required to be participants under the CPRS is they directly emit more than 25,000 tonnes of $CO_2$-e per year, although it is noted that different thresholds maybe necessary for the waste sector and synthetic GHGs. This threshold will be the general point of obligation. However there will be other points of obligations. In the stationary energy sector a point of obligation will lie at the fuel supplier for smaller energy users (presumably ones below the threshold). Obligations in the transport sector will also lie with fuel suppliers.

For the first five years the CPRS will have a carbon price cap, an option that was rejected in the New Zealand scheme. The cap will be set high enough so that its probability of use will be low given expected international carbon prices. Along with a price cap, the scheme will also have an emissions cap, set for a period of at least five years. The scheme includes a long-term target of reducing emissions by 60% of 2000 levels by 2050.

Over the period 2010-2011 to 2012-2013 AAUs will not be accepted under the CPRS. Units that will be accepted are AEUs, ERUs, RMUs, and CERs (except tCERs and lCERs), and these units may be banked. Non-Kyoto international units (such as the NZU) will not be accepted under the scheme. It was decided that including these units would add unnecessary administrative complexity to the scheme given that these non-Kyoto units could not be used to meet Australia's Kyoto obligations. Over the long term the scheme proposes that the allocation of AEUs will move towards complete auctioning, with the exception of assistance for trade-exposed and strongly affected industries. The free allocation for trade-exposed industries (excluding agriculture which is yet to be included in the scheme) would amount to approximately 20% of Australia's AEUs. This assistance will decrease over time, and will be dependant on the actions of Australia's competitors beyond 2020.

[12] See http://www.climatechange.gov.au/emissionstrading/timetable.html (last accessed 14/1/09)

***Japan***

Japan established a voluntary emissions trading scheme in 2005, the 'Japanese voluntary emissions trading scheme' (JVETS). The Japanese government used the scheme as a means of gathering information on cost-efficiency and management of emissions reduction policy, and the effectiveness of voluntary schemes. The scheme is only includes $CO_2$ emissions and uses both CERs and JPAs (Japanese emissions allowance). Under JVETS, firms that entered the scheme set concrete emissions reduction targets. Firms receive economic incentives for reducing emissions, in the form of subsidies for emissions reducing technology amounting to one third of the cost of the emissions reduction activity. However, if a firm fails to meet its target it must return the subsidy to the government. Of note, the scheme is *facility* based, not company based, and facilities are selected on the cost-effectiveness of possible emissions reductions. Participants are able to bank excess emissions units for use in future periods. Also of note is that the scheme is limited to only 32 participants in the first round of the scheme (this will be extended to 58 in the second) and it does not include major emitting industries (most notably electricity generation). Concerns have been raised that the voluntary nature of the scheme encourages firms to set low targets and achieve it excessively. It is likely that a mandatory scheme will be introduced in Japan in the near future.[13]

***Norway***

Norway introduced an ETS in 2005. It coved only $CO_2$ emissions and 51 institutions representing 10-15% of total emissions (mainly industry and some from the energy sector). This scheme was linked with the EUETS in 2008 by conforming to the EU's emissions trading directive.

***United Kingdom***

The United Kingdom is a participant in the EUETS. Notwithstanding this, the UK has proposed a Carbon Reduction Commitment scheme covering $CO_2$ emissions from large non-energy intensive business and public sector entities that a not covered by the EUETS. The mandatory scheme initially involves the non-capped fixed price sale of allowances, this will later be capped and allowances auctioned. The scheme is designed to include firms that fall below EU electricity use threshold but whose total contribution amounts to 10% of the UK's total emissions, such as supermarkets, banks, hotels and government bodies (Department of Trade and Industry, 2007). The threshold is a half-hourly metered electricity consumption of greater than 6,000 MWh per year. Organisations covered under the EUETS or other domestic climate change policy will be exempt form the scheme.

[13] For further information on the JVETS see
http://www.iges.or.jp/en/cp/pdf/activity06/07.pdf (last accessed 14/1/09)
http://www.arb.ca.gov/research/seminars/japan/japan3.pdf (last accessed 14/1/09)
http://www.icapcarbonaction.com/docs/mrvce_material/session1/Session_I_Yasushi_Ninomiya_Japan2.pdf (last accessed 14/1/09)

### *North America*

The United States government has been slow to address the problem of climate change and has contributed little to international agreement – it remains the only developed nation yet to (and unlikely to) ratify the Kyoto Protocol. However, in line with trends around the world a willingness to act is developing. At a federal level the recently elected President, Barack Obama, has signalled a desire to take strong action on climate change and a preference to use an economy-wide cap-and-trade programme with a goal of reducing GHG emissions 80% by 2050, with a proposed 100% auctioning of units (Obama-Biden, 2008). Ten northeastern states currently participate in Regional Greenhouse Gas Initiative (RGGI). The RGGI is a cap-and-trade scheme imposing obligations on $CO_2$ emissions from power plants with a generating capacity of 25 MW or greater. Permit auctioning began in late 2008, and a three-year commitment period began on 1 January 2009. Revenue generated from the scheme will be used to promote energy conservation and renewable energy (RGGI, 2008). Another proposed regional climate change initiative is the Western Climate Initiative (WCI), established in the main by states in the west of North America; it currently involves 11 participating members and 13 observing states. It seeks to establish a foundation for a cross-boarder ETS involving the United States and Canada. The current participants in the scheme have agreed to being reporting in 2011 for 2010 emissions. The trading scheme will itself begin in 2012, with an expected expansion in 2015 (WCI, 2008).

## Conclusion

The NZETS hopefully signals a new era of climate change policy in New Zealand. The scheme is novel in many respects, even world leading. However, the importance of these factors should not be over stated. In many ways the novelty of the NZETS was driven not the Labour-led government's desire for New Zealand to be a world leader on climate change, rather it resulted from the uniqueness of New Zealand's emissions profile and a recognition of the steps needed to make real reductions in New Zealand's emissions. Major emissions reductions need to come from major emitters, and it is for this reason that all sectors, including the agriculture sector, are participants in the NZETS. Other emissions trading schemes can afford to exclude agriculture (if they so desire) in order to reduce emissions as agriculture emissions make up only a small part of their total emissions. New Zealand does not have this luxury, the inclusion of agriculture in the NZETS is necessary if the scheme is going to create real and overseas comparable emissions reductions.

Concern remains as to the effect the NZETS will have on both the New Zealand economy and New Zealand's emissions record. Estimates and modelling as to the economic cost of the scheme vary greatly and are heavily influenced by their assumptions. Emissions reduction need not be costly, in fact for a small, technologically inventive country like New Zealand creating new emissions reducing technology could provide significant economic opportunity. New Zealand needs to be a 'future-maker'; while New Zealand alone cannot make a significant difference to the world's climate, it can show the world how efficient and effective emission reductions can be made. Reducing emissions is also important for New Zealand's reputation and trade. Consumers globally are becoming more 'carbon conscious' in what they purchase and where they travel. With distances so great between New Zealand and its trading and tourist markets it will be imperative in

coming years that 'brand New Zealand' includes a reputation for responsible and effective action on climate change.

It is important that the new National-led government, and future governments beyond it, do not undo the large amount of work that has been done in the creation of the NZETS. New Zealand has struggled with hesitancy in its climate change policy for over a decade. Now that substantive action has been taken, it is the time to look forward and not return to the tired debates of days gone by. It is also valuable to remember that if emitters do not bear the costs of their emissions, this burden then falls to the taxpayer, and ultimately future generations.

The NZETS is a valuable start to effective emissions reduction policy in New Zealand. It has been slow coming, but should serve as a platform to further expand future climate change policy in New Zealand. Concerns remain able the NZETS, its short term environmental effectiveness appears limited – an objection often raised toward the Kyoto Protocol. However, it is important to view both the Kyoto Protocol and the NZETS in context. They provide a framework to build from in future agreements and policy, neither attempt, nor are able, to provide a panacea to our global and local climate change problems. What they provide is a start. It is important that we as a nation continue to build on this beginning and do not once again put climate change policy in the 'too-hard' basket.

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## Appendix A: A Short Chronology of New Zealand's Climate Change Policy

**August 1990** – New Zealand's first climate change policy announced by the Fourth Labour government. This policy committed to reduce $CO_2$ emissions by 20% from 1990 levels by 2005 (later revised to 2000).

**October 1990** – National defeated Labour in the 1990 General Election.

**1992** – The National government released a 'Carbon Dioxide Reduction Action Plan' committing to a reduction in $CO_2$ emissions of 20% from 1990 levels by 2000.

**November 1993** – National won the 1993 General Election.

**1994** – New Zealand ratified the UNFCCC New Zealand's emissions target was revised to a reduction in emissions to 1990 levels by 2000. This would come from a mix of voluntary agreements, energy reform and forestry. The government threatened to impose a carbon tax if industry failed to cut emissions by 1997.

**October 1996** – A National-led government was formed following 1996 General Election.

**1997** – No carbon tax was implemented, despite growing emissions. The government adopted the Kyoto Protocol target of reduction $CO_2$-e emissions to 1990 levels during the first commitment period (2008-2012).

**May 1998** – The Kyoto Protocol was signed by the National government.

**November 1999** – A Labour-led government was formed following the 1999 General Election.

**Late 2001** – The Ministry of Economic Development lead a working group focused on the design of an ETS involving dialogue sessions with representatives from the transport and oil sectors, the waste industry, and the coal, gas and geothermal industry. The Department of Prime Minister and Cabinet published the results of consultation on whether New Zealand should ratify the Kyoto Protocol. It was noted that many submitters lacked an understanding of New Zealand's international obligations.

**Early 2002** – The government released its preferred policy package on climate change. This included a carbon tax on energy, industrial, and transport emissions, capped at $25 per tonne of $CO_2$-e, the exemption of agricultural emissions from any broad based price measure during CP1, 'Negotiated Greenhouse Agreements' for large emitters who risked a loss of competitiveness, 'Projects to Reduce Emissions' to provide addition Kyoto units during CP1, joint industry and government funding of research in the agricultural sector and government retention of sink credits and associated liabilities from forestry.

The Department of Prime Minister and Cabinet published the results of a consultation document on the government's preferred policy

package for dealing with climate change. It found that stakeholders generally accepted the package.

**July 2002** – A Labour-led government was formed following 2002 General Election

**November 2002 -** The Climate Change Response Act 2002 was passed. The Act put in place a legal framework to allow New Zealand to ratify the Kyoto Protocol and to meet its obligations under the UNFCCC.

**December 2002** – The Labour-led government ratified The Kyoto Protocol. The government proposed that a carbon tax capped at $25 per tonne of $CO_2$ be in place by the beginning of the first commitment period as a means of achieving New Zealand's Kyoto commitments.

**January 2005** – The European Union establishes the EUETS.

**September 2005** – A Labour-led government was formed following the 2005 General Election. The government dropped its proposed carbon tax due to a lack of parliamentary support caused by the opposition of governing partners New Zealand First and United Future to the introduction of a tax.

**December 2006** – The government released five consultation documents as part of its Draft Energy Strategy.

The consultation process included approximately 50 public or multi-sector meetings, workshops, Hui, and approximately 100 focused stakeholder meetings.

**September 2007 –** The government released a proposal for a NZETS, 'Framework for a New Zealand Emissions Trading Scheme'. The Climate Change (Emissions Trading and Renewable Preference) Amendment Bill was introduced as the mechanism for establishing the scheme.

**2008** – The first Kyoto Commitment Period began.

**Early 2008** – The Finance and Expenditure Select Committee heard submissions on the Bill. The National and the Greens gave minority views. The Bill was split by the Committee of the Whole into The Climate Change (Emissions Trading) Amendment Bill and the Electricity (Renewable Preferences) Amendment Bill.

**August 2008** – The Labour-led government won the support of the Greens and New Zealand First, giving it a parliamentary majority supporting the passage of the bill. In return for their support the Labour-led government promised the Greens a NZ$1 billion household insulation fund, and promised New Zealand First greater support to those on low incomes facing higher electricity prices.

**9 September 2008** – The Climate Change Response (Emissions Trading) Amendment Bill passes its third reading with the support of Labour, the Progressives, the Greens and New Zealand First.

**25 September 2008** – The Climate Change Response (Emissions Trading) Amendment Act was passed into law. Forestry enters the NZETS.

**16 November 2008 -** A National-led government was formed following 2008 General Election.

**11 December 2008** – The National-led government announced that the Climate Change Response (Emissions Trading) Amendment Act and other climate change measures would be reviewed by a Select Committee, this was to honour the terms of the confidence and supply agreement between National and ACT.

**1 January 2010** – The stationary energy sector and the industrial processes sector enter the NZETS.

**1 January 2011** – Transport enters the NZETS.

**2012** – The first Kyoto Commitment Period ends.

**1 January 2013** – Agriculture, waste and other sectors enter the NZETS.

**2029** – Free allocation of NZUs to Agriculture ends.

## Appendix B: Kyoto units

The Kyoto Protocol established four types of 'emissions units' that Annex B (developed) countries can use to meet their obligations. Each unit represents one tonne of $CO_2$-e emissions. Each Annex B country must retire emissions units covering their emissions during CP1; the four types of units are interchangeable for this purpose. The Protocol establishes three 'flexibility mechanisms' to enable units to be acquired from other countries through emissions trading, clean development mechanism projects and joint implementation projects. The units are:

**Assigned amount units** (AAUs) – These units are allocated freely to Annex B countries and match the targets set in each individual country, they represent that countries 'allowed emissions'. For example, New Zealand has committed under the Kyoto Protocol to contain its emissions to five times 1990 levels on average between 2008 and 2012. New Zealand is therefore assigned an amount of AAUs of five times the amount of emissions produced in 1990. Article 17 of the Protocol allows these units to be traded by Annex B countries, that is, countries that have more AAUs than needed to meet their Kyoto commitments may trade the excess to countries that exceed their targets. In theory, this gives developed states a financial incentive to reduce emissions. This represents a 'cap and trade' system, with the total amount of AAUs issued to Annex B parties forming the 'cap'.

**Certified emission reductions** (CERs) – These credits are generated from emission reductions created by clean development mechanism (CDM) projects. The CDM was established under Article 12 of the Protocol. It is designed to provide incentives to developed (Annex I) countries to undertake emissions reduction or limitation programmes in developing (non-Annex I) countries. The goal of this is to promote emission reduction activities in developing countries, and also provide developed nations with flexibility in how they meet their CP1 commitments. These projects can be certified and receive CERs equivalent to one tonne of $CO_2$-e. The Protocol establishes that certification is to be judged on the basis of:

a. Voluntary participation by each party involved
b. Real, measurable and long-term benefit related to the mitigation of climate change, and
c. Reductions in emissions that are additional to any that would occur in the absence of the certified project activity.

Once earned, CERs can be sold or used to meet Kyoto obligations. There are two other forms of CERs: temporary certified emission reductions (tCERs) and long-term certified emissions reductions (lCERs). These are generated by CDM forestry projects and are not accepted under the NZETS due to concerns about the environmental integrity of these projects and carry a risk of future liabilities for the Crown (MfE 2007a).

**Emission reduction units** (ERUs) – ERUs are generated through a mechanism called 'joint implementation' (JI) established under Article 6 of the Protocol. A JI project is one that is undertaken by an Annex B party to reduce or remove emissions in another Annex B country. Participation in a JI project can earn the parties ERUs, equivalent to one tonne of $CO_2$-e, which can be sold or used to meet CP1 Commitments. The 'host party' also benefits from the foreign investment that is involved, by receiving new low emission technology and reducing emissions. The criteria for JI projects are similar to that of CERs,

requiring the approval of the parties involved and a reduction in emissions that is additional to that which would have occurred.

**Removal units (RMUs) –** RMUs are units issued to Annex B countries for net emission removals from land use, land use change and forestry activities (LULUCF) such as emission removals from forest sinks or reforestation. An RMU is equal to one tonne of $CO_2$-e and can be used by Annex B parties to meet their CP1 commitments.

**Appendix C: Glossary of abbreviations**

AAU – Assigned Amount Unit
ABARE – Australian Bureau of Agricultural and Resource Economics
AEU – Australian Emissions Unit
BAU – Business as usual
CDM – Clean Development Mechanism
CER – Certified Emissions Reduction
$CO_2$ – Carbon dioxide
$CO_2$-e – Carbon dioxide equivalent
CP1 – Kyoto Commitment Period One
CPR – Commitment Period Reserve
CPRS – Carbon Pollution Reduction Scheme (Australia)
DPMC – Department of Prime Minister and Cabinet
ERU – Emissions Reduction Unit
ETS – Emissions Trading Scheme
EU – European Union
EUETS – European Union Emissions Trading Scheme
GDP – Gross domestic product
GGAS – Greenhouse Gas Abatement Scheme
GHG – Greenhouse Gas
HFCs – Hydrofluorocarbons
IPCC – Intergovernmental Panel on Climate Change
JI – Joint Implementation
JVETS – Japan Voluntary Emissions Trading Scheme
Kyoto gases – Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride
Kyoto units – AAUs, CERs, RMUs, ERUs, lCERs, tCERs.
lCER – long-term certified emissions reduction
LULUCF – Land use, land use change and forestry
MAF – Ministry of Agriculture and Forestry
MED – Ministry of Economic Development
MfE – Ministry for the Environment
NGO – Non-governmental organisation
NZETS – New Zealand Emissions Trading Scheme
NZEUR – New Zealand Emissions Unit Register
NZU – New Zealand Unit
PFCs – Perfluorocarbons
RGGI – Regional Greenhouse Gas Initiative
RMU – Removal Unit
tCER – Temporary certified emission reduction
UNFCCC – United Nations Framework Convention on Climate Change
WCI – Western Climate Initiative