

Discussion paper on measures to

REDUCE GREENHOUSE GAS EMISSIONS IN NEW ZEALAND POST-2012





Ministry for the
Environment
Manatū Mō Te Taiao

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1. Foreword

Climate change is a serious global problem, probably the most serious challenge our planet faces in the 21st century.

The way of life we enjoy as New Zealanders is also at risk. Our biologically-based economy and the environment we cherish are especially vulnerable to climate change. It is in our best interests that all countries work together to reduce greenhouse gas emissions.

This government recognises that a long-term vision, enduring policies and responsible action will be needed if we are to effectively contribute to global efforts to address climate change, and the risks it poses to New Zealand.

As part of that, New Zealand needs to prepare for a world where greenhouse gas emissions carry a cost. This is not a New Zealand government initiative; it is an international reality, regardless of what happens with the Kyoto Protocol.

The cost arises from reducing greenhouse gas emissions, whether this is achieved through regulation, price-based instruments, or other measures. While action to reduce greenhouse gas emissions will have a moderate cost, the predicted costs and risks of inaction are higher.

We are taking action to cut emissions, to make New Zealand truly sustainable, and to help us stay on the same footing as our international trading partners.

We have already announced a large number of practical, everyday measures to reduce greenhouse gas emissions, and more measures are being developed. Many of these measures have other benefits, such as improving air and water quality, reducing erosion and flood risk, reducing electricity and fuel bills through improved efficiency, making homes and workplaces healthier, improving energy security and protecting our native flora and fauna.

At the same time, we are taking action to prepare New Zealand for the effects of climate change. These effects may include rising temperatures and sea levels, and more frequent and severe weather events, including floods and droughts.

The government wants to engage with the wider public, industry and business on climate change issues to inspire their willing, effective and long-term involvement.

Through innovation and determination, we can find ways to transform our economy to one that is sustainable, and reap the benefits that this brings.

This discussion paper is one of a series being released by the government for consultation during the first quarter of 2007. It focuses on longer-term measures that could be applied broadly across the economy beyond 2012, and is designed to complement the following papers on sectoral policy measures:

- *Powering Our Future: The Draft New Zealand Energy Strategy to 2050 and its companion action plan*
- *Transitional Measures: Options to move towards low emissions electricity and stationary energy supply and to facilitate a transition to greenhouse gas pricing in the future*
- the replacement *National Energy Efficiency and Conservation Strategy*
- *Sustainable Land Management and Climate Change.*

I look forward to receiving your views on what actions we should take to protect the unique way of life we enjoy as New Zealanders.



Hon David Parker
Minister Responsible for Climate Change Issues



2. Executive Summary

Climate change is a long-term strategic issue for New Zealand within the broader context of sustainable development. As New Zealand continues to shape its climate change policy and reduce its emissions, it needs to prepare for a likely future in which international efforts to reduce greenhouse gas emissions become broader and more stringent.

Changing business-as-usual practices to reduce emissions will impose a moderate economic cost, as well as generating economic and other opportunities. Increasingly, countries are facing the question of how they can achieve least-cost mitigation consistent with sustainable development, and who, either directly or indirectly, should bear the cost. In New Zealand, policy design around this issue will have important implications for the overall economic efficiency of reducing emissions, the distribution of costs and opportunities across key players in the economy, and the international competitiveness of trade-exposed producers.

The government expects that, over time, all sectors of the economy should play a fair part in the national response to climate change, reflecting the fact that some sectors will be able to reduce their emissions more easily than others. An important policy consideration is the competitiveness of sectors in which there are no emissions-reducing technologies available at moderate cost. The government expects different sectors may require different pathways to making the transition towards increasingly stringent emission constraints over time.

Countries can apply price-based measures to support least-cost mitigation and to lessen the risk of investment decisions that could lock assets into emissions-intensive production and harm their international competitiveness in the longer term. Price-based measures, also referred to as market instruments, can be applied to integrate the costs (or opportunity costs) of greenhouse gas emissions into decision making in the marketplace, influencing choices in production, consumption and technology development. They can operate as “carrots”, by rewarding positive behaviour, and “sticks”, by imposing a cost on negative behaviour. Price-based measures can be applied on a narrow basis or more broadly across whole sectors or multiple sectors of the economy.

The purpose of this discussion paper is to start a dialogue on what policy measures would be preferred in New Zealand after 2012 (the end of the first commitment period of the Kyoto Protocol) to reduce its emissions, and protect and enhance its sinks, across key sectors of the economy. Although New Zealand’s international emission reduction obligations after 2012 are uncertain, it is important to begin discussing future policies now. A clearer specification of future policies provides greater certainty for investment and business planning and better guidance for the development of transitional measures in individual sectors. However, flexibility should be built into long-term policies so they can adapt to changing conditions and allow conditionality in how any particular policy measure might be applied.

This discussion paper was prepared under the government’s climate change work programme on alternatives to the carbon tax, which is considering longer-term policy measures that could be used to reduce New Zealand’s greenhouse gas emissions post-2012. This paper does not address the broader issue of the stringency of New

Zealand's longer-term goals to reduce its emissions and enhance its sinks, or the detailed development of shorter-term policy measures appropriate to individual sectors, which are the subject of other work programmes. However, this discussion paper is relevant to work undertaken through the sectoral work programmes because shorter-term sectoral measures should not preclude the implementation of longer-term, broad price-based measures. It is intended to complement consultation documents being produced under sectoral work programmes and focusing more specifically on shorter-term measures to reduce emissions.

This discussion paper will be of particular interest to stakeholders who are major producers or consumers of energy, and who need to make long-lived investments that will determine their future exposure to increased international pricing of greenhouse gas emissions. It will also be of interest to stakeholders in the transport sector, which presents particular challenges regarding the role of broad emissions pricing in changing behaviour as well as fuel and technology choices in the longer term.

The agriculture and land-use change and forestry sectors will also find this discussion paper relevant. These sectors carry out two types of activities: land management¹ and product processing. The product processing (or manufacturing) operations are major energy consumers (and to some extent, energy producers), and would be treated similarly to other industrial producers in a policy context. With land management activities, the nature and timing of the mechanisms for extending emissions pricing over time is likely to vary. Key considerations would include exposure to international competition, actions by major trading partners, the availability of cost-effective mitigation options, measurement and monitoring issues, and administrative complexities. While it is important to consider these issues at a broad level in the economy-wide context of this discussion paper, they will be analysed in greater depth under the government's climate change work programmes on agriculture, land-use change and forestry.

Stakeholders are invited to consider this discussion paper alongside other consultation documents being released: *Powering Our Future: The Draft New Zealand Energy Strategy to 2050* and its companion action plan, *Transitional Measures: Options to move towards low emissions electricity and stationary energy supply and to facilitate a transition to greenhouse gas pricing in the future*; the replacement *National Energy Efficiency and Conservation Strategy*; and *Sustainable Land Management and Climate Change*. This discussion paper provides a long-term context for selecting sectoral policies that will place New Zealand on a desirable pathway for managing its emissions and sinks in a manner consistent with its national interests.

This discussion paper invites stakeholders to present their views on core questions facing New Zealand policy makers regarding climate change policy post-2012. These questions relate to the following issues:

- What are your assumptions regarding the future direction of international climate change policy? (Section 4)
- To what extent should government policy devolve the costs and opportunities associated with climate change policy to producers, consumers and the general

¹ Land management includes pastoral farming, arable farming, horticulture and forest management activities.

taxpayer post-2012? How should this vary by sector, and over time, to best support the national interest? (Section 5)

- How can broad² price-based measures be used post-2012 to reduce emissions, enhance sink management and accelerate investment in new technologies? How should the coverage and design of price-based measures vary by sector, and over time, to best support the national interest? (Sections 6–10)
- What process should the government use to make decisions on long-term climate change policy? (Section 11)

New Zealand's long-term strategy for reducing its greenhouse gas emissions and enhancing its sinks could include a mix of sectoral and economy-wide measures, including price-based, voluntary and directive regulatory measures. This discussion paper specifically assesses the following measures (in no particular order):

- **Emissions trading.** An emissions trading scheme would require a group of emitters to hold tradable units or allowances to match some or all of their greenhouse gas emissions over a defined period. Essentially it would cap the quantity of emissions, and allow the market to determine the least-cost means of compliance. The cap could be defined on an absolute or relative (intensity) basis and could be set at the international, national, or sectoral level. Emission allowances could be freely allocated and/or auctioned. Emissions trading is considered an economically efficient mechanism for achieving emission reductions, and a wide range of design options are available. This paper assesses three trading models: cap and trade, baseline and credit trading and offsets trading. Considerations for New Zealand include the relatively small size of the domestic trading market, the potential to create linkages to trading systems internationally, the feasibility of allocating emissions liability to major emitters in different sectors, the efficiency and equity of different approaches for allocating emission allowances, and the process for recycling any government revenues produced by the scheme.
- **Greenhouse gas charge.** A greenhouse gas charge would raise the price of emitting activities to reflect their environmental cost, creating an incentive to reduce emissions where it is cost-effective to do so. A greenhouse gas charge could affect behaviour in production and consumption depending on the extent to which emitters improved their efficiency, absorbed the costs, or alternatively, passed the costs on to consumers. A greenhouse gas charge would provide greater certainty to emitters on the cost of emissions, but less certainty to the government on the quantity of emission reductions achieved. The government would be required to set the level of the charge and determine the method for recycling government revenue to the economy. If the charge did not produce the expected level of emission reductions at the national level, then the liability for remaining reductions would fall on the general taxpayer.
- **Other regulatory approaches.** Options could include amendments to the Resource Management Act 1991 (RMA) or the Electricity Act 1992. For example, regulations could impose offset requirements, emission limits or performance standards for major emitters in key sectors. In the case of the RMA, such

² Broad measures could apply to all or some of the energy, transport, agriculture, forestry and waste sectors.

measures could give local government the responsibility for administering direct emissions of greenhouse gases.

- **Emission reduction agreements.** Under an emission reduction agreement, a firm or sector would make a commitment to the government to manage its emissions or meet specified targets. Commitments could be voluntary or mandatory, and the consequences of non-compliance could be binding or nonbinding. Emission reduction agreements would potentially be more flexible in setting different emission reduction targets and activities across different emitters, according to their circumstances. Key challenges to the design and uptake of these agreements are the process for developing agreements and ensuring compliance, and the level of stringency of such agreements. This includes how efficient and fair they would be compared to measures in other firms and sectors.

This discussion paper assesses the merits and disadvantages of price-based measures alongside the other measures identified above. Although no decisions have yet been made, the government has stated it has a positive view on the use of economically efficient price-based measures applied broadly across key sectors of the economy in the longer term (ie, post-2012), provided such measures are consistent with New Zealand's economic and sustainable development interests and the longer-term international climate change policy framework.

In addition, the paper addresses a series of general policy issues relating to the distribution of costs and opportunities from climate change measures post-2012. These issues must be considered carefully regardless of which types of measures are selected. The issues include:

- reducing emissions at least cost
- determining emission reduction goals or targets for sectors
- managing the impacts of measures on the international competitiveness of New Zealand firms
- defining who participates in different measures
- recycling any revenue from policies back into the economy
- building capacity for emitters to participate in policy measures.

A key question facing policy makers is the extent to which decisions on longer-term implementation measures can or should be made now, or left for future decision-makers. Such decisions could include defining the architecture of the measures, defining the stringency of the measures, and determining when to introduce the measures in the economy generally and/or in particular sectors. Two possible approaches to this question, for the purpose of discussion, are:

- (a) To define the architecture of the measures now but leave decisions about the stringency of the measures across different sectors until key uncertainties, particularly the nature of the international policy framework, are clarified; or
- (b) To outline a set of principles for when measures would be applied and how stringently, but not to specify actual measures until the international situation is clearer.

The paper presents an indicative proposal for a path forward for government decisions on longer-term climate change policy. Note that this is not a government policy proposal or preferred approach, but instead is intended to serve as a starting point for discussion on this important issue.

The challenge facing New Zealand is how to design climate change policy measures that reap the potential benefits of emissions pricing, minimise costs, and best enable New Zealand to achieve its integrated sustainable development goals. The policy must recognise the international context of actions taken in New Zealand, including the need for the world's major emitters to take effective action. The government believes the pace and stringency of New Zealand's response to climate change should be aligned with our national interest and in step with what major emitters – including our major trading partners – are doing.

Submissions on the discussion paper

The primary objective of this discussion paper is to provide information on options and help to develop a consensus on the direction of longer-term climate change policy. In consequence, the paper does not provide specific government proposals for future climate change policies. Stakeholders are invited to use this paper as the basis for submitting their views to help officials develop recommendations to Cabinet. This paper will also provide a framework for discussions between officials and stakeholders through workshops and smaller focused meetings taking place between December 2006 and February 2007. A detailed government proposal for longer-term measures is expected to be released next year for consultation after submissions on this discussion paper have been considered.

Officials will prepare a public summary of submissions received on this discussion paper. The public summary will not attribute comments to individual submitters. Please note that your comments will be subject to the Official Information Act 1982 and may need to be publicly released. If you object to the release of any material provided in your submission, please specify the material that you consider should be withheld and the grounds for withholding. Please note that even if you do identify specific material that you consider should be withheld, we cannot guarantee that we will withhold this material. All requests under the Official Information Act need to be assessed in terms of the Act and while we will take into account your views, we are not bound by them.

Making a submission

Submissions on this discussion paper are required by 30 March 2007.

Electronic copies of this discussion paper and the submission template are available on the climate change website of the Ministry for the Environment <http://www.climatechange.govt.nz>.

Electronic submissions are encouraged and should be emailed to climatechange@mfe.govt.nz.

Written submissions should be made using the template provided at the back of this paper and be addressed to:

Post-2012
Ministry for the Environment
PO Box 10-362
Wellington

3. Introduction

3.1 Background to New Zealand's climate change policy

New Zealand's natural resources and equable climate, combined with its entrepreneurial and creative people, are the basis of its competitive advantage as a small trading nation. Looking out over the next 30-40 years, the effects of climate change and the global response to it present major challenges to New Zealand's future capacity to protect and enhance its economy, its communities, its environment and its way of life. New Zealand will need to do its fair share in addressing climate change if it is to influence collective international action and protect its own economic and environmental interests.

After a climate change policy review in 2005, the government concluded some elements of the 2002 climate change policy package should be modified to enable New Zealand to better respond to the longer-term challenges of climate change. One outcome was the announcement in December 2005 that the previously-announced carbon tax would not proceed. A suite of future work programmes was developed to inform government decisions in light of the review and to contribute to developing further measures.

The government's guiding principles for its climate change policies are that they:

- be long term and strategic
- balance durable efforts to reduce emissions with preparations for the impacts of a more variable climate
- engage with the wider public, industry and business to inspire their willing, effective and long-term involvement
- focus on international engagement that advances New Zealand's national interests.

To ensure policy signals are credible and sound long-term investment decisions can be made, the government believes it is essential that the fundamentals of domestic climate change policy endure over a prolonged number of years.

The government's current policy development process is underpinned by some key assumptions that are consistent with the approach it has taken to climate change over the past few years. These include:

- Faced with sufficient consensus on climate change science, responsible government must act to address the risks for New Zealand's vulnerable environment, economy and way of life. While action to reduce greenhouse gas emissions over the long term will have a moderate cost, the predicted costs and risks of inaction are expected to be unacceptably high.
- Effective international action is needed to reduce global greenhouse gas emissions. To support and encourage international action, New Zealand needs to

play its part in reducing emissions, as well as encouraging other countries, especially the major emitters, to act.

- New Zealand's response should maximise the economic advantages of using energy and resources more efficiently. New, and newly economic, technologies will play a crucial role. Policy should facilitate New Zealand involvement in the development or adaptation of low emissions technologies relevant to our needs.
- Our policy response should start with the most achievable options and seek least-cost solutions. A combination of sectoral and economy-wide measures, including voluntary, price-based and regulatory measures, is likely to be needed. Short-term measures must not be inconsistent with likely long-term solutions and should at the very least curb increases in emissions.
- All sectors of the economy should play a fair and equitable part in the national response to climate change, reflecting the fact that some sectors will be able to achieve emissions reductions more easily than others. An important policy consideration is the competitiveness of sectors in which there are no low emissions technologies available at moderate cost.

3.2 Overview of the New Zealand Energy Strategy and replacement of the National Energy Efficiency and Conservation Strategy

The development of New Zealand's climate change policy for the energy sector fits within the context of the development of the New Zealand Energy Strategy (NZES) and the replacement National Energy Efficiency and Conservation Strategy (NEECS).

The NZES will provide long-term direction and leadership to put New Zealand firmly on the path to an energy system that supports economic development, while being environmentally responsible. Through the NZES, the government remains committed to promoting energy efficiency and renewable sources of energy. Under the NZES, short-term policies and measures will be developed to assist the long-term reduction of New Zealand's greenhouse gas emissions from the energy sector. For information on the NZES, refer to the website of the Ministry of Economic Development (www.med.govt.nz).

The NEECS, in place since September 2001, is due to be replaced. The Energy Efficiency and Conservation Act sets out a statutory process for developing a replacement NEECS. Officials are coordinating the replacement NEECS with the NZES. For information on the replacement NEECS, refer to the website of the Energy Efficiency and Conservation Authority (www.eeca.govt.nz).

3.3 Work programme on alternatives to the carbon tax

The work programme on alternatives to the carbon tax is investigating:

- longer-term policy measures, including price-based measures, for reducing greenhouse gas emissions across the New Zealand economy post-2012
- implications for the design of transitional measures.

This work programme assesses two specific price-based measures – emissions trading (including cap and trade, baseline and credit trading and offset trading models) and greenhouse gas charges. It also examines the contrasting approaches of directive regulation, such as under the Resource Management Act 1991, and emission reduction agreements. It seeks to develop a clear and widely-shared understanding of these measures, their potential effectiveness in supporting New Zealand's longer-term climate change goals, and a sense of stakeholder preferences for different design options.

Public consultation on these measures was undertaken when the government's 2002 climate change policy package was being developed. However, national and international circumstances around climate change policy have changed substantially since then: the science of climate change has advanced considerably; the Kyoto Protocol has entered into force, although without the participation of the United States and Australia; an international carbon market now exists; and world energy prices have increased beyond expectations. This work programme challenges officials and stakeholders to re-evaluate a range of implementation measures within the evolving domestic and international context.

The government is considering a broad range of climate change implementation measures across various sectoral work programmes. However, the range of mitigation policies and measures is not limited to those discussed in this work programme. The government expects a mix of sectoral and economy-wide measures, including price-based, voluntary and regulatory measures, will be needed to achieve the integration of New Zealand's sustainable development objectives. Specific aims for climate change measures may include:

- developing incentives to encourage fuel switching to renewable and low emissions energy sources for new electricity generation in a way that is compatible with energy security and efficient pricing
- accelerating capital stock turnover and deployment of best available technologies
- promoting development and commercialisation of new technologies
- reducing the growth in energy demand and direct emissions across all sectors of the New Zealand economy.

As discussed earlier, the energy-sector elements of this work programme fall within a broader policy framework for the management of New Zealand's energy sector,³

³ Note that the transport sector has its own climate change work programme outside the development of the NZES and the replacement NEECS and will be reporting to Cabinet separately on measures to address transport-sector greenhouse gas emissions.

including the development of the NZES and the replacement NEECS. Final decisions by Cabinet on the use of specific measures for the energy sector will be undertaken within the context of the NZES.

This work programme also has important links to the other sectoral climate change work programmes of agriculture, land-use change and forestry, and transport. In the longer term, a broad price-based measure such as emissions trading could potentially be applied across all major emitting and sequestering sectors of the New Zealand economy. This would create a price linkage for mitigation efforts across diverse sectors such as electricity generation, industrial production, transport, agriculture, forestry and waste. However, the detailed assessment of shorter-term policy measures in sectors such as land-use change and forestry, agriculture and transport, and the potential for such measures to support a transition toward a broad price-based or other measure, will be addressed within each sectoral work programme.

4. Longer-Term Climate Change Policy Development

This section of the discussion paper provides context to the development of long-term climate change policy and the potential role of price-based measures. It also presents considerations for the design of transitional policy.

4.1 The future international climate change policy framework

Intergovernmental discussion on climate change is accelerating and some form of future global framework for reducing emissions beyond 2012 is expected to evolve over time. International actions that are likely to contribute to the evolving discussion include the United Nations Framework Convention on Climate Change, the Kyoto Protocol, the G8 Gleneagles Dialogue and the Asia-Pacific Partnership on Clean Development and Climate (AP6).

Over time, mitigation efforts are likely to cover more countries and become increasingly stringent as countries are required to make a significant impact on the rate of climate change. There is a wide range of possible scenarios for how future frameworks for international climate change policy, and consequently the shape and stringency of any international obligations taken on by New Zealand, may develop. For the purpose of illustration, these could include features such as:

- a continuation of the original Kyoto Protocol framework with further agreed emission targets for Annex I (industrialised) countries and possibly for some developing countries, complemented by international emissions trading and flexibility mechanisms
- differentiated but non-quantitative commitments to climate change mitigation actions for developing countries
- the development of regional or plurilateral arrangements which could vary in approach from applying binding emissions targets to promoting technology development and diffusion
- the development of sectoral arrangements under which particular emitting sectors or industries (such as aluminium or cement) would commit to emission control standards on a sectoral rather than a national basis
- the adoption of intensity targets rather than capped emission commitments by countries under either international or regional agreements
- a technology-centred approach by which incentives or funding are provided for the development of new technologies.

Combinations of these features could coexist within any future international policy framework for climate change.

A number of organisations have released detailed studies on future international climate change scenarios. We encourage you to refer to these in answering the questions in this document. Studies can be found, for example, at:

http://www.pewclimate.org/policy_center/international_policy

http://www.ecofys.com/com/publications/documents/Ecofys_TowardsaPost-2012ClimateChangeRegime.PDF

http://www.iisd.org/climate/unfccc/post_kyoto.asp

<http://www.fiacc.net>

4.2 The role of price-based measures in New Zealand's climate change policy

New Zealand and other industrialised countries that have ratified the Kyoto Protocol already face a cost for their greenhouse gas emissions. Countries whose net emissions from the first commitment period, 2008 to 2012, exceed their unit allocation for that period (called their assigned amount) will have to either buy additional units internationally or incur a penalty⁴. The price of purchased units will depend upon the relative international supply of, and demand for, emission units available to industrialised countries that have accepted targets for the first commitment period. Other countries pursuing a separate regulatory approach to reducing emissions, such as Australia, also face a cost for their greenhouse gas emissions from reducing emissions below the level at which they would otherwise occur.

One of many questions for governments is how to minimise those costs and who should bear them. In New Zealand, the government's climate change policy will determine the extent to which the cost of greenhouse gas emissions will be devolved to emitters or consumers, or covered by taxpayers more broadly.

While there is uncertainty about the nature of future international climate change obligations, it is reasonable to expect increasing international efforts to mitigate climate change. This will come at an economic cost.

Currently, it is unclear to what extent different countries will apply comparably stringent climate change mitigation measures under the post-2012 international climate change policy framework. Regardless, it is reasonable to expect that many countries will attempt to utilise some level of "flexibility mechanisms" such as international emissions trading, or mechanisms to support emissions mitigation projects, to take advantage of

⁴ Under the first commitment period of the Kyoto Protocol, the penalty for emissions in excess of emission units (including assigned amount units, removal units from eligible domestic sequestration, and purchased units) takes the form of a more stringent emissions reduction requirement for the subsequent commitment period. The penalty consists of deduction from the party's assigned amount for the second commitment period of a number of tonnes equal to 1.3 times the number of tonnes of excess emissions during the first commitment period. In addition, the party will not be able to transfer assigned amount units to other parties under Article 17 (international emissions trading) until it has submitted an acceptable compliance plan demonstrating that it will meet its commitment in the second commitment period.

least-cost opportunities for emissions mitigation. This may or may not result in the creation of an identifiable international price of greenhouse gas emissions that can be traded internationally.

Under any future emissions constraint or target, a domestic price-based measure could help New Zealand capture the least-cost mitigation opportunities across the New Zealand economy. Depending on the future international framework for climate change, particularly the extent of international emissions trading or other international flexibility mechanisms, a price-based measure with international linkages could also allow New Zealanders to access least-cost mitigation opportunities in other countries. In the absence of a clear emissions price signal across the economy, it is less likely that mitigation options that are implemented are the lowest-cost options available.

Accordingly, the government is considering whether it would be in New Zealand's best interests to adopt price-based measures to mitigate greenhouse gas emissions in the future. However, it is not clear that all sectors would readily respond to price-based measures, and it may be necessary in some sectors to retain a diverse portfolio of measures to operate alongside price-based measures, or possibly as a substitute for them.

Forging new pathways for sustainable economic growth will impose some transitional economic costs as well as generating long-term environmental and economic benefits. The challenge facing New Zealand is how to design climate change policy measures that reap the potential benefits of emissions pricing, minimise costs, and best enable New Zealand to achieve its integrated sustainable development goals. It will also be important to design the policies to recognise the international context of actions taken in New Zealand, including the need for the world's major emitters to take effective action.

4.3 Transitional climate change policy development

As noted above, separate work programmes are developing shorter-term policy measures in sectors such as energy, transport, forestry and agriculture. This section of the paper discusses key considerations in the design of shorter-term (ie, pre-2012) measures to support a transition toward a broad price-based measure at some time after 2012.

In the shorter term, a range of measures could help to prepare key sectors or major emitters within those sectors to face a price for their greenhouse gas emissions. Such measures might be designed to meet one or more of the following objectives:

- increase the capacity of major emitters to measure, monitor and report their emissions. This might involve compliance with a standard for emission inventory reporting
- increase the capacity of major emitters to participate in domestic and international emissions trading. Examples include participating in project activities and narrow trading between firms
- influence investments in new plant capacity by ensuring future emission pricing is taken into account when these decisions are made. This would start to achieve mitigation by ensuring that lower-emission alternatives were put in place, and avoid any subsequent complaints that implementation of a price measure would

strand investments that would not have been made in circumstances of policy certainty

- influence behaviour at the margin to reduce emissions in the operation of existing assets. There can be opportunities for many firms to reduce their emissions without replacing their current assets prematurely. In addition, the practices and processes established within firms to manage their current emissions can contribute to improved emission management and production efficiency in the longer term
- contribute to the process of allocating emission allowances in a subsequent price-based measure applied broadly across the economy. A shorter-term measure might provide the framework in which firms' performance in emissions management is recognised, which could influence their treatment in the subsequent allocation of emission allowances.

The effective use of a shorter-term measure to achieve these capacity-building goals may depend on some prior commitment to basic design features of the future price-based measures. For example, the effort firms put into building their capacity to participate in emissions trading could be of limited value if the subsequent measure is a greenhouse gas charge. Firms that could be points of obligation under an emissions trading regime would have different requirements to those not directly participating.

Price-based measures, emission reduction agreements and directive regulatory measures could be used individually or in combination to help meet these goals in the shorter term. Such measures could be designed specifically to phase in a selected long-term price-based measure, or could be designed more generally to be compatible with long-term price-based options.

4.4 Stakeholder assumptions in responses to this paper

Stakeholders' expectations of future economic conditions and the international climate change policy framework are likely to strongly inform responses to the questions in this document. Those assumptions are vital to the government's interpretation of responses. Stakeholders are encouraged to report their key understandings and assumptions under the questions below.

Questions for discussion

- 1) Do you expect international efforts to reduce greenhouse gas emissions to continue? If so, in what form?
- 2) Do you believe a price-based measure such as emissions trading, which gives emitters the responsibility for at least some of their emissions, could enable businesses to find the lowest-cost way to reduce emissions?
- 3) Would you prefer directive regulations to a price-based measure?
- 4) What, if any, pre-conditions would need to be met internationally and/or domestically before a broad price-based measure such as a greenhouse gas charge or emissions trading was introduced in New Zealand?

If you do not have a strong view on the future international framework for climate change policy, you might like to consider the following two possible scenarios in your responses to other questions in this paper.

Scenario One: A post-2012 environment with an emissions trading system including most industrialised countries (and including major emitters such as the United States, Japan and the European Union), with other major-emitting developing countries also taking steps to curb their emissions.

Scenario Two: A post-2012 environment with international emissions trading limited to the EU emissions trading system, with a significant amount of effort directed towards climate change mitigation in the rest of the developed world, but not under a coordinated international framework and varying in stringency and approach across countries.

5. Policy Development on Devolving the Cost of Emissions

This section addresses a suite of general policy issues relating to the question of how the government should devolve emission reduction and sink management costs and opportunities to producers, consumers and the general taxpayer post-2012. These issues must be considered carefully regardless of which types of implementation measures are selected. The issues include: options for realising least-cost mitigation opportunities; determining emission reduction goals or targets for subsets of emitters; determining the most appropriate way to manage the impacts of climate change measures on the international competitiveness of New Zealand firms; selecting thresholds for determining which firms are subject to specific measures; revenue recycling; and building capacity for strategic emissions management, including measurement, monitoring, reporting, verification and emissions trading.

Some of these general issues may be particularly important in the design of shorter-term policies and measures, and may become less significant over the longer term. For example, competitiveness-at-risk issues for New Zealand firms will ease if the international climate change policy framework produces climate change measures that are comparably stringent across countries. There could be less need to set sectoral or sub-sectoral targets if a price-based measure was applied broadly across the New Zealand economy in place of disparate sectoral mitigation policies. However, other measures, such as revenue recycling, capacity building, and realising least-cost mitigation, are likely to remain important considerations in the design of both shorter- and longer-term policies and measures.

5.1 Realising least-cost mitigation opportunities

Greenhouse gas emissions have a global climate impact. As a result, reductions in emissions (or removals by sinks, such as carbon uptake in biomass) anywhere in the world will have a comparable impact on mitigating climate change. Similarly, it is possible to equate the relative global warming impacts of different greenhouse gases. This enables climate change policy measures to support least-cost emissions reductions wherever they happen, and to maintain the environmental integrity of those emission reductions.

The principle of achieving least-cost emissions mitigation was incorporated into the Kyoto Protocol. The Kyoto Protocol sets country-specific targets for industrialised (Annex I) countries as the basis for an initial allocation of emission allowances (called assigned amount units) during the first commitment period (2008–2012). However, it does not require Annex I countries to meet their emission reduction targets solely through domestic measures. Annex I countries with emission reduction targets can achieve a portion of those targets through three flexibility mechanisms that work across country borders: joint implementation (projects between industrialised countries), the clean development mechanism (projects between industrialised and developing countries), and international emissions trading (the trading of assigned amount units among industrialised countries).

Similarly, the Kyoto Protocol does not constrain Annex I countries from making cost-effective emission reductions in different sectors of their economies and across the sources of the six greenhouse gases included in the Kyoto Protocol. The Kyoto Protocol does place some specific limits on the use of removals by sinks (biomass and soil) in the forestry and agriculture sectors to meet emission targets.

When designing climate change policies, it is important to consider options for least-cost mitigation across sectors and national borders while achieving other environmental and economic objectives. Whether the government pursues emissions trading, greenhouse gas charges, emission reduction agreements or regulatory mechanisms, it may be possible to enable some flexibility in the cost of compliance by applying the following options:

- investing in domestic emission reduction or sequestration activities which have long-term benefits through a cross-sectoral projects mechanism, a centralised fund or another mechanism
- trading emission allowances domestically across different sectors of the economy
- investing in the Kyoto Protocol's two projects mechanisms (joint implementation and the clean development mechanism) or similar international projects mechanisms
- linking to international emissions trading schemes
- enabling the fully flexible exchange of cash (based on the international price of greenhouse gas emissions or another price set by the government) and emission units to meet emission reduction obligations.

Flexibility mechanisms create opportunities and challenges. The opportunities result from enabling entities with higher-cost emission reduction options to pay those emitters that could reduce their emissions at lower cost. This could help to ensure that the cost to New Zealand firms of reducing their emissions is broadly comparable to the costs faced in other countries.

Challenges result from administering these types of mechanisms and aligning them with the policy's other environmental and economic objectives. For example, there are additional transaction costs and policy complexities associated with certifying and trading project-based emission reductions. In addition, even if domestic emission reductions were more costly in New Zealand than in other countries, it could still be in the national interest to pursue domestic emission reductions because of other co-benefits, such as economic development, energy security and local environmental gains.

Questions for discussion

- 5) Under what conditions should the government support or limit the use of domestic and international flexibility mechanisms by firms or sectors with emission reduction targets or obligations?

5.2 Determining emission reduction goals/targets for subsets of major emitters

Cabinet has invited Ministers to consider “bold goals or objectives” as part of their ongoing sectoral work programme responsibilities. Such sectoral goals and targets could be defined in qualitative or quantitative terms. They could be expressed in terms of scenarios, policy objectives, technology outcomes, emissions levels or some combination of factors.

If particular measures are targeted to a subset of emitters, they may require specific emission reduction goals or targets. For some kinds of policy measures, it may not be necessary to translate broader policy objectives into quantitative emissions targets for subsets of major emitters. For example, emission reduction targets do not need to be set for subsets of emitters when using a market-based instrument such as emissions trading or a broad greenhouse gas charge. The main feature of these types of measures is devolving liability for emissions directly to the emitters, and then enabling them to choose the most cost-effective response. This response could include reducing their emissions by increasing efficiency, paying a price on their emissions (in the case of an emissions charge), or surrendering any allocated or purchased allowances (in the case of emissions trading). The level of environmental benefit achieved by the system will depend on the level of the price on emissions (in the case of an emissions charge) or the overall cap on the number of emission allowances in the market (in the case of emissions trading).

In the case of emissions trading, an important distinction should be made between setting emission reduction targets and allocating some quota of free emission units or allowances. An emission reduction target implies that an emitter should reduce its emissions to a specific level. A free allocation of emission allowances reduces the cost to the emitter of carrying an emissions liability, but does not imply that the emitter has to reduce its own emissions to meet the level of free allocation.

When using regulatory measures or emission reduction agreements, it may be more important to consider the use of quantitative emission reduction targets or emissions standards for subsets of emitters within the broader context of sectoral or national goals for reducing emissions. However, such targets would have to be imposed in an equitable way across sectors and across emitters, and enable New Zealand to achieve its climate change goals. Setting such targets for subsets of emitters could be a very complex decision-making process.

5.3 Leakage and competitiveness issues

Applying a greenhouse gas price directly to emitters would have both supply- and demand-side impacts across the New Zealand economy. A price could be imposed through an emissions trading system, a greenhouse gas charge or by regulatory measures. It could potentially be applied to all greenhouse gas emissions, specific greenhouse gases or emissions from specific sectors or sources.

For many New Zealand businesses, the increased costs that would be caused by a greenhouse gas emission price could be passed through to their customers or otherwise managed over time. However, this may not be the case for some energy- or

emissions-intensive New Zealand firms exposed to international competition from countries with less stringent climate change policies. Those New Zealand firms may not be able to pass emissions-related price increases through to their customers because of competition from countries that did not place an additional emissions-related price on emissions. As a result, the New Zealand firms may lose market share to international competitors. This condition is referred to as competitiveness-at-risk.

There could be a risk of economic and environmental leakage if competitiveness-at-risk firms were exposed to a significant price on all their emissions, at least in the short term. Leakage refers to a shift in production and emissions from New Zealand to other countries. To the extent that reduced production in New Zealand is offset by increased production in other countries, particularly in countries with less stringent environmental standards, there would be no global environmental gain from such displacement and there would be a negative impact on the New Zealand economy. This risk could apply regardless of whether the government used price-based or regulatory measures to reduce the emissions of such firms. However, this risk is also linked to a broad array of factors affecting firms' international competitiveness, such as currency exchange rates, market fluctuations, labour costs, material costs, productivity and underlying energy prices. Failure by New Zealand firms to adjust to a low-carbon global economy would also damage their international competitiveness in the longer term.

General policy options for managing competitiveness impacts

Within the range of options for price-based policies in the relevant sectors, there are two policy strategies for managing the economic and social costs associated with a business becoming competitiveness-at-risk.

The first policy strategy is prevention. Examples could include: full, partial or transitioning exemption from emission reduction obligations or costs; rebates for costs passed through to at-risk firms; subsidies; border protection; free allocation of emission allowances; and regulatory exemptions. A related approach could be to provide for a gradual increase in the stringency of the measure, potentially resulting in a slowly increasing cost impact. Such an approach is similar to a tightening cap in an emissions trading system with an initial free allocation of emission allowances.

The second policy strategy is providing a safety net to assist with the economic and social adjustment to a lower-emitting economy. Examples could include special unemployment benefits, retraining programmes and relocation assistance.

Examples of preventive strategies include:

- In Denmark from 1996, the carbon tax was set at a lower level for “heavy processes” or energy-intensive sectors, with an additional reduction in exchange for negotiated agreements. Commitments were based on a requirement to carry out energy audits and implement recommendations that met a specified investment criterion.
- In the United Kingdom from 2000, firms and sectors with negotiated agreements have received an 80 percent discount on their Climate Change Levy payments.
- The European Union Emissions Trading System provides a level of gratis allocation of emission allowances to participating sectors based predominantly on historic emission levels.

- Under the previously announced New Zealand policy, firms with Negotiated Greenhouse Agreements were to receive rebates or exemptions covering emissions equivalent to a “world’s best practice” emission rate, and submit or receive emission units for marginal greenhouse gas emissions above or below that level.

Conceptually, managing the competitiveness issue is separate from setting a performance goal or target. In a straightforward cap and trade scheme, in particular, environmental outcomes are determined by setting the emission cap. Any subsequent decision to protect some firms from competitiveness impacts by allocating free allowances to them need not affect the expected environmental outcome. In a charge system, the incentive to mitigate is determined by the charge rate and coverage.

Measures such as exemptions or free allocation can have very significant financial implications for firms and for the economy as a whole. They may create distortions and intra-industry competitiveness issues for the sectors involved. Exempting some emitters from emission reduction obligations effectively shifts their adjustment burden onto other emitters, and may make the economy as a whole less efficient in responding to limits on emissions. Conversely, where some sectors have low-cost technological choices but others do not, universal emission reduction obligations are effectively more costly for some sectors than others. Protecting some firms from emission reduction obligations could increase the overall cost to New Zealand of reducing its emissions. However, in the shorter term, it may be in New Zealand’s broader social and economic interests to mitigate some of the sectoral adjustment effects of introducing an emissions constraint across the economy.

Allocation on the basis of historical emissions may be the simplest approach to compensation for competitiveness-at-risk firms. However, this may be simplistic and risk over-allocation, particularly to firms that may have had high emissions in the past due to low investment in efficiency measures. Allocation in the context of requiring firms to make forward commitments or agreements may reduce these risks. Another option is allocation on the basis of benchmarking for the efficiency of production. All of these options will involve implementation costs for firms and the government.

Experience with allocation under phase one of the European Union Emissions Trading System

Under the first phase of the European Union Emissions Trading System (EU ETS), running from 2005 to 2007, all sectors received a free allocation of allowances based predominantly on historic emissions levels. This allocation method has been widely criticised for creating substantial windfall profits for some sectors, in particular the electricity sector, which is said to have passed on the cost of allocated allowances directly to consumers. Sectors such as steel and cement are more exposed to international competition and are less able to pass on these costs. A key conclusion from several reviews of the first years of trading is that there needs to be a greater differentiation of allocation methods across sectors to correct for these effects, including sector-wide (instead of member state) allocations for some sectors, a greater use of benchmarks instead of historical emissions, and use of some level of auctioning in addition to gratis allocation. The European Commission has issued new guidelines to member states to this effect for the second phase of the system, which runs from 2008 to 2012. Allocation to the electricity sectors of all member states is expected to be much tighter in the second phase. For more information on the EU ETS, refer to section 13.

Considerations for electricity generation

In the New Zealand context, electricity is not an internationally traded commodity and generation firms are not exposed to international competition. In principle, the consideration of competitiveness-at-risk issues does not lead to any case for gratis allocation or charge exemptions for the electricity sector. However, some energy-intensive firms in the industry sector might be put at risk by the impact of a greenhouse gas price passed through in electricity prices, especially if all electricity prices increase as a consequence of a price on emissions from fossil-fuel generation. Comparatively low energy prices have given some energy-intensive manufacturing firms a competitive advantage internationally. Some industrial firms could also potentially be placed at risk by the impact of a greenhouse gas cost on non-electricity energy use and on process emissions.

Generation of electricity in New Zealand is characterised by high levels of renewable energy sources, which is likely to continue to be the case in the future. As a result, the future emissions intensity of New Zealand grid electricity will be low compared to electricity consumed in many major trading partner countries. This reasoning implies a price on emissions from electricity generation would potentially have a low impact, relative to trading partners, on the wholesale price of electricity supplied in New Zealand. However, the size of the impact depends on whether the price on emissions is applied to marginal or absolute emissions and whether the wholesale clearing price of electricity is determined by fossil fuel or renewable generation. As major trading partners incorporate the price of greenhouse gas emissions into their economies, New Zealand's high proportion of renewable electricity generation may give energy-intensive industries a competitive advantage.

Considerations for the agriculture and land-use change and forestry sectors

These sectors have two types of activity: product processing and land management. The product processing operations are major energy consumers (and to some extent, energy producers), and would have similar interests to those of other manufacturers

across the economy. Land management includes a range of activities such as pastoral and arable farming, horticulture, and forestry.

If greenhouse gas pricing were extended across the economy, this could include methane and nitrous oxide from agricultural production. Farmers could lose profit or export market share if they had limited ways of reducing their emissions and could not pass the price increases on to export customers.

If greenhouse gas pricing were extended to land-use change and forestry, forest owners could both face liabilities for conversion of forests to other land uses⁵, and attract investment by earning carbon credits in new forest planting. This would alter the relative economics of land use, and in particular have some influence on land-use change from forestry to agriculture.

A range of options is available for moderating the impact of emissions pricing on land management activities:

- A cost on marginal emissions, instead of full emissions, as discussed more generally above. For example, analysis suggests that if emissions were charged at the margin for livestock production, the cost of increasing emissions through increasing stock numbers may be approximately four percent of the gross revenue associated with those increased stock numbers.
- An emissions size threshold to exempt smaller producers from bearing an emissions charge.
- Financial incentives for marginal emission reductions achieved through verified projects. Further analytical work would be needed to ensure that such project-based emission reductions were fully reflected in New Zealand's national greenhouse gas inventory.
- Agricultural emitters to offset total or marginal emissions by investing in new forest plantings, biofuels, renewable energy or other greenhouse gas-reducing or sink-enhancing activities.

Major considerations in developing the government's agriculture and forestry work programmes are likely to include exposure to international competition, action by major trading partners, availability of cost-effective mitigation options, responsiveness to pricing mechanisms, measurement and monitoring issues, and administrative complexities. Across all sectors, to the extent that competing firms in other countries also face local or international emissions pricing over time, the risk of leakage will be reduced and eventually disappear.

Considerations for the transport sector

Transport energy consumption in New Zealand accounts for 37 percent of total energy use. Greenhouse gas emissions from transport energy consumption have increased 62 percent since 1990. The Stern Review⁶ notes about 14 percent of total global

⁵ For example, land uses with a lower net carbon storage value or which emit higher levels of greenhouse gases such as agriculture or residential development.

⁶ Stern, N. et al. (2005) *Stern Review: The Economics of Climate Change*. Report from H.M. Treasury to the UK Chancellor of the Exchequer. Cambridge: Cambridge University Press. ISBN-10: 0-521-70080-9.

greenhouse gas emissions come from transport. If greenhouse gas pricing were extended into the transport sector, the increased costs could impact on the competitiveness of New Zealand products in the international market by increasing total costs of production and distribution.

Questions for discussion

- 6) In the longer term, should the same price of emissions apply across all sectors of the economy? If not, how could the stringency of emission targets be determined for different sectors?
- 7) What measures should the government consider for managing the international competitiveness impacts of its climate change policies?
- 8) How might the government set a threshold for acceptable levels of competitiveness-at-risk impacts for firms subject to international competition?
- 9) What conditions would justify removal of any measures to deal with competitiveness issues?

5.4 Thresholds

A threshold is needed to establish which entities would be covered by a price-based instrument or regulatory mechanism. The definition of the threshold will have important implications for the number of participants, the emissions coverage of the mechanism, the administrative feasibility of implementation, equity among entities above and below the threshold, and economic efficiency. The definition of a threshold would have to include definition of the entity, the scope of its activities or emissions that are covered, and the metric used to determine which emitters are categorised as large emitters and included in the instrument or mechanism.

Considerations for the energy and industrial sectors

In the case of the energy and industrial sectors, the relevant entity to serve as a point of obligation might be a firm as a whole, a business unit or a single site. Officials believe a single site may be the most appropriate entity to use because many New Zealand firms are conglomerates with different types of operations, only some of which would qualify as large direct emitters and be suitable for inclusion in a price-based or regulatory policy measure. However, further work is needed in this area. There will be challenges in developing a clear and enforceable definition that can apply to the full range of corporate structures in the New Zealand industry and energy sectors.

The scope of coverage might include all of the entity's emissions or be restricted to emissions associated with major processes, excluding items covered by other measures. The metric might be based on a number of measures, such as energy use, direct CO₂ emissions, or energy or emission intensity. A significant issue would be whether to base the participation threshold on absolute emissions or energy use, or on intensity. Including only the largest emitters in a price-based or regulatory mechanism could simplify administration of the mechanism but create domestic sectoral market distortions.

Considerations for the agriculture and land-use change and forestry sectors

When setting thresholds for emitters in the agriculture and forestry sectors, key considerations are which gases and emitting activities to include. Manufacturers or processors in these sectors could be treated similarly to other industrial firms. In the case of land managers, separate thresholds may be needed with regard to methane emissions from ruminant livestock production, nitrous oxide emissions from fertiliser use and livestock excrement, carbon dioxide emissions from land-use conversion, and carbon sequestration from forest planting. Thresholds may need to be further differentiated by type of activity. A key consideration is measurability.

Alternatively, a de-facto collection point at point of processing could be defined. Regulatory rules could be used to control intensity (or measures that ensure adoption of best practice) on each farm. Under this option, the calculation of emissions would be per unit of output based, such as per kilogram of milk solids.

Once the nature of the threshold had been defined, it would be appropriate to set a size threshold. To reduce transaction and administration costs, which could pose a significant barrier to small producers, participation could be limited to major producers. Another option would be to aggregate smaller producers on a regional or sectoral basis, and manage their emissions collectively. Collective management could be accomplished through an industry-level organisation or some kind of government entity. However, careful consideration would be needed regarding the domestic market distortions that could result from setting thresholds in the agriculture and forestry sectors. The design of the threshold should not create perverse incentives for producers to subdivide their operations to avoid the threshold, or to displace emitting activities from operations inside the scheme to those outside the scheme (a form of domestic leakage). In addition, consideration should be given to fair treatment of large and small emitters across all sectors of the economy. These issues will be considered in the further development of the government's climate change work programmes on agriculture, land-use change and forestry.

Considerations for the transport sector

Price-based (or other) measures could be applied to the transport sector at three levels: individual consumers of transport energy, major transport energy producers or importers, or larger, commercial transport energy consumers. Each level would require a different threshold definition. For example, placing a greenhouse gas charge or emissions trading obligation upstream at the level of fuel production or import may not require a threshold definition if the measure was intended to encourage downstream transport energy consumers to decide whether to absorb or avoid any cost increase. Alternatively, a measure aimed at larger transport energy users would require an entity-level threshold, such as total transport energy consumed. The measure might then need a separate emissions threshold to define the scope of emissions from the entity covered by the measure. Such a measure could enable participating entities to trade or offset their emissions.

This work programme appreciates the difficulty and importance of reducing greenhouse gas emissions from the transport sector. A suite of measures would probably be required: any price-based measure would probably need to be supported by regulatory measures, such as standards and enforcement, as well as changes to urban design and other incentives, such as education and information, to encourage consumer behavioural change and modal choices. The transport climate change work programme

is investigating a range of possible measures for reducing greenhouse gas emissions. The treatment of transport-related emissions under broad price-based or other policy measures post-2012 should reflect analysis and decisions made under that work programme.

Considerations for the waste sector

Most emissions of greenhouse gases from the waste sector are from solid waste to landfill or the treatment of waste water. By far the largest source is methane emissions from the anaerobic decomposition of organic matter in landfills. In recent years, these emissions have been progressively declining because of reduced waste volumes and improved landfill management practices. The introduction of the 2005 National Environmental Standard (NES) to control greenhouse gas emissions from landfills is predicted to have a further significant impact on net emissions from the sector. When the NES was introduced, 19 landfills met the one-million-tonne capacity threshold for mandatory landfill gas collection and destruction. The design of a threshold for the solid waste sector should aim to not unfairly penalise those 19 landfills already regulated by the NES.

In contrast, nitrous oxide and methane emissions from industrial, commercial and residential waste water treatment are relatively small and have a much larger number of sources. Direct estimates of emissions are currently not possible for waste water treatment plants. A threshold could be defined on the volume of waste water processed, although varying processing types result in different amounts of emissions for any given volume. The main issue for this sub-sector is the administrative efficiency of any threshold due the range of treatment types, number of plants and measurement of emissions.

Questions for discussion

- 10) How should the government define and enforce a threshold determining which firms or sites should be included in the scheme? For example, should a threshold be defined on an intensity or absolute basis?
- 11) How could the government design a threshold to minimise competitiveness and equity problems?

5.5 Revenue recycling

Greenhouse gas charges, auctions of emission allowances/units and regulatory penalties can raise substantial revenues that can be returned to the economy in many ways. One option is to link revenue from a greenhouse gas charge or allowance auction to reductions in existing taxes on business or individuals. The economic gain from such tax reductions could partly offset the costs associated with the economy's adjustment to emissions constraints. Revenue recycling could be designed to offset the impact of higher energy prices on consumers. The funds could also be used to pay for projects which reduce emissions, described as tied revenue. In addition, the funds could be used by the Crown to purchase units to cover any deficit in the first commitment period.

The Minister of Finance announced in the 2005 Budget that revenue from the proposed carbon charge was to have been recycled back to businesses in the form of tax relief. Specific areas targeted were compliance costs, changes to depreciation and fringe benefit tax rules. Underlying this decision was the argument that the options for spending revenue, irrespective of its source, should be judged on their merits alongside other proposals. Any other application of the revenue was considered an increase in the overall tax burden through resulting tax-system efficiency losses. This consideration did not include an assessment of applying carbon tax revenue to purchasing international units to cover a net deficit position over the first commitment period.

Example: Revenue recycling from the UK Climate Change Levy

The UK Climate Change Levy is a tax on business use of energy determined through different rates per kilowatt hour for coal and gas, LPG and electricity. It covers the use of energy across all industrial, commercial, and agricultural sectors, including the public sector, but excludes the domestic and transport sectors. It provides for negotiated agreements between the government and energy-intensive sector organisations.

Revenue from the levy has been used to reduce a general tax (the government cut the rate of employers' National Insurance Contributions by 0.3 percent) and to provide a fund for energy efficiency and emission reduction projects, such as administered through the Carbon Trust.

Links:

UK Climate Change Levy website: <http://www.defra.gov.uk/environment/ccl/>

Carbon Trust: <http://www.thecarbontrust.co.uk>

OECD review: <http://www.oecd.org/dataoecd/54/41/34512257.pdf>

Typically, tax reductions are designed to achieve economy-wide or industry-wide benefits, not to offset specific competitiveness impacts. In the case of a greenhouse gas charge or emissions trading scheme, the price burden of competitiveness impacts could be very unevenly distributed, with only a modest burden on most businesses but a substantial burden on a few sectors. General cuts in existing business taxes funded by a greenhouse gas charge or permit auction revenues might not adequately compensate the highly burdened industries. Another way of targeting relief to these industries could be through the mechanism of the charge or trading scheme itself, or through direct payments or exemptions. This was the intention of the Negotiated Greenhouse Agreements policy in the previous climate change policy package, in which rebates were to be provided to eligible firms according to their direct and indirect payment of the tax.

Another option for revenue recycling is to tie the revenue to specific climate change mitigation or adaptation activities, or to relieve consumers who are disproportionately affected by the increased price of energy and other important goods and services. Challenges associated with using the revenue in this way include coping with the variations in funding flows over time, deciding the relative allocation of funding among specified activities and ensuring the efficient use of funding. It could also be argued that providing emitters with money in proportion to their emissions-related burden is ultimately self-defeating, unless the money is applied to reducing emissions.

Question for discussion

- 12) Should revenues from climate change policy measures be returned to the economy through either general tax relief or funding for targeted activities? If you believe revenues should be returned to the economy through funding for targeted activities, which activities should be considered?

5.6 Building capacity for strategic emissions management

As longer-term policy measures become more sophisticated and broader in scope, it will be increasingly important to build the capacity of major emitters to meet their emissions reporting obligations and manage their emissions strategically. Major emitters will need to develop the data systems and management tools to measure, monitor, verify and report their emissions. Depending on the design of longer-term measures, major emitters may also need to develop the expertise to participate in emissions trading or offset activities. Building capacity for emissions reporting can also play a vital role in helping firms to understand the sources of their emissions, identify opportunities to reduce emissions and manage their liability for emissions under various policy measures.

This issue will initially be addressed by specific sectoral work programmes, which will aim to support the short-term measures proposed in those sectors. In the longer term, to the extent that a consistent price-based measure might be adopted across sectors and is devolved to emitters, it is likely that new types of measurement, monitoring, verification and reporting will be required for a number of sectors. The chosen approach is likely to be driven by the choice of measures and the administrative complexities and compliance cost of reporting, particularly in sectors with a large number of point-source emitters such as transport. In sectors with a large number of emitters, a top-down approach aimed at collecting emissions data at points of fuel supply may be required rather than a bottom-up approach aimed at individual emitters. A top-down approach is consistent with the general approach currently adopted for compiling New Zealand's emission reporting under the Kyoto Protocol.

For large direct emitters, measurement, monitoring, verification and reporting of emissions could be vital elements of any long-term measure and are likely to also be important elements of shorter-term measures. Early development of capacity by large emitters to manage these issues will be important in designing and implementing shorter-term measures, and may be necessary to ensure all emitters are treated fairly.

Question for discussion

- 13) What assistance would large direct emitters need to prepare for mandatory monitoring, measurement and reporting?

Examples of reporting guidelines

A number of major industrial emitters already report emissions performance either publicly or internally. Reporting standards and procedures have been developed, or are under development, by several business organisations. These include:

The WRI and WBCSD GHG Protocol Initiative:

<http://www.ghgprotocol.org/templates/GHG5/layout.asp?MenuID=849>

The ISO 14064 series of standards, available for purchase via:

<http://www.iso.org> or <http://www.standards.co.nz>

6. Emissions Trading

An emissions trading scheme requires a group of emitters to hold tradable units or allowances to match some or all of their greenhouse gas emissions over a defined period. Emitters can either reduce their own emissions or trade allowances to meet their obligations. While there are a number of types of emissions trading schemes, two principal options analysed in this paper are the cap and trade and baseline and credit models. The difference between the two is that the cap and trade model uses an absolute framework, in that allowances must be surrendered to the authorities for every tonne (or other unit of quantity) of emissions produced, while the baseline and credit trading model uses a relative framework, where only deviations from an emissions baseline must be accounted for.

Emissions trading schemes are particularly suited to sectors in which emissions can be estimated and reported accurately at low cost, which have a reasonable number of emitters and in which the transaction costs of covering those emitters are not unreasonably high. The stationary energy sector and industrial processes sector generally fulfil these requirements and have been the main target for these kinds of measures internationally. However, emissions trading could potentially be applied in other sectors, such as transport, waste, agriculture and forestry. The government's climate change work programmes on transport, agriculture, land-use change and forestry will give further consideration to any issues specific to the inclusion of these sectors in a broad emissions trading regime.

A third option is to allow for trading of cross-sectoral offset credits, either as a stand-alone model or along with either cap and trade or baseline and credit models. Alternatively, any emissions above a specified level could be required to be compensated for with offset credits, which would in turn be tradable.

An emissions trading system recognises that the cost of abating greenhouse gas emissions differs across different entities and provides opportunities to reduce the total cost of emission reductions by allowing them to be made where it is cheapest to do so.

Emissions trading can offer more flexible settings than a greenhouse gas charge and is likely to be more effective in encouraging emission reductions in areas where it is most cost-effective. However, costs of establishing a broad emissions trading regime may be higher than for a greenhouse gas charge.

6.1 Trading models: cap and trade, baseline and credit, and offset trading

This section outlines in general terms features of three emission trading approaches. In practice, any chosen trading scheme may have a mix of features (eg, a cap and trade scheme with a sectoral offsets component).

A more detailed assessment of the relative merits of these different models in the context of the energy sector is provided in the government discussion paper *Transitional Measures: Options to move towards low emissions electricity and stationary energy supply and to facilitate a transition to greenhouse gas pricing in future*.⁷

Cap and trade

The main feature of a cap and trade scheme is that a fixed ceiling or cap is set for a certain type of emissions (international examples are CO₂ and NO_x) over a set period of time in combination with tradable emission allowances. A cap and trade scheme is in effect a regulation with a market component. The allowances are initially allocated in some way (eg, based on historical emissions, auctioned or purchased at a fixed price), typically among existing sources. Each source covered by the programme must hold allowances to cover its emissions, and is free to buy and sell from other sources.

Essential elements of a cap and trade scheme are:

- emissions are capped at some level in each period
- allowances to emit greenhouse gases are issued for each period
- there is a penalty for non compliance.

Key design issues include:

- point of coverage
- threshold for entry
- use of offsets or other flexibility mechanisms
- method of allocation of allowances.

Under a standard cap and trade design, an overall emissions cap is applied to a group of emitters and tradable emission allowances equal to the cap are issued into the market (eg, through gratis allocation or auction). To comply with the scheme, emitters must surrender allowances equal to their total emissions. An absolute cap provides some level of certainty about the volume of emission allowances available in the market. The relative supply of emission allowances, and the demand for them, determines their market value.

Baseline and credit

In baseline and credit schemes, individual emitters are assigned an emissions baseline which represents a schedule of allowable emissions over time. These can be defined on an absolute or an intensity basis.

Emitters are exempt from carrying a liability for their emissions up to a baseline level, which has to be less than actual emissions to have a substantial effect. If the scheme is based on absolute emissions, it is no different from a cap and trade scheme with

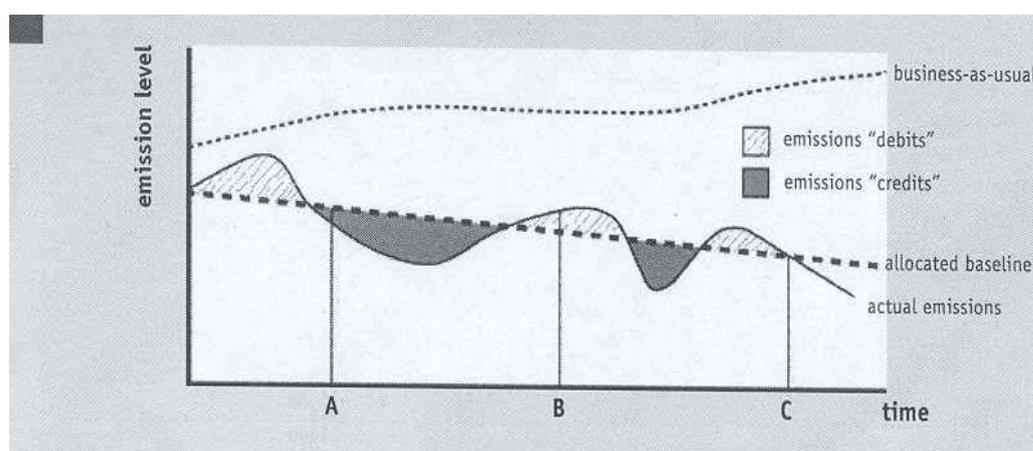
⁷ This paper has been released by the Ministry of Economic Development as part of its consultation on the draft New Zealand Energy Strategy, and is available at: www.med.govt.nz.

grandparented allowances. The only allowances likely to be traded are associated with deviations from the initial allocation.

Baseline and credit schemes start to differ from cap and trade schemes when they are designed on the basis of emission intensity: sources must buy additional allowances when their emissions rate per unit of activity (energy input or output of energy or product) exceeds the baseline level. The system allows emitters to increase their total emissions without being required to buy more allowances, as long as the emissions are the result of increased activity rather than a change in the emissions intensity of the production.

For the purposes of this discussion paper, baseline and credit schemes are taken to operate on an intensity basis, with an emitter's baseline expressed in terms of tonnes of emissions per unit of production. An emitter can increase its production and its absolute emissions without being required to provide allowances, as long as the amount of emissions per unit of production remains below the baseline.

The diagram below illustrates the approach to crediting under a baseline and credit system.⁸



A major distinction between baseline and credit schemes and cap and trade schemes is the timing of provision of allowances to participants. While the intensity baseline is determined in advance for baseline and credit schemes, the actual amount of production and the emission intensity of that production is not known until the end of the year (or other period used). Consequently, emitters do not know the extent of their liabilities or benefits until the end of the period, when emission allowances are allocated. With cap and trade schemes, the amount of the cap is known in advance irrespective of production levels, so allowances can be allocated with certainty at the start of the period.

The treatment of firm closures and new entrants could be simpler under a baseline and credit model because a cap and trade system requires a proportion of the cap to be set aside for unknown new entrants. Similarly, a cap and trade system could create

⁸ Australian Greenhouse Office (1999). "National emissions trading: Designing the market" (Discussion Paper 4).

perverse incentives to keep inefficient plants running at low output, should there be a policy to prevent the sale of allowances from closed plants by withdrawing allowances. A baseline and credit system does not require a new entrant reserve and, on closure, a firm would not receive any benefit of allowances to trade because entitlement to allowances might depend on continued operation.

Trading of cross-sectoral offsets

The term offsets is used to describe a reduction or removal of greenhouse gas emissions that counterbalances emissions elsewhere in the economy. In the context of this paper, offsets can be activities that are funded by emitters in one sector to reduce or sequester emissions in other sectors such as agriculture or forestry. The government's discussion paper *Transitional Measures* (referenced earlier) also looks at the option of trading cross-sectoral offsets, but in the narrower context of using offset trading to meet emission obligations in the stationary energy sector.

Activities that generate offset credits tend to be in the form of projects: an activity at an identifiable location that is individually managed and accounted for. The possibility of implementing project measures is being considered both by the draft NZES, for the stationary energy sector, and more generally by the climate change work programme on "the need for and future shape of, cross-sectoral incentive programmes such as the Projects to Reduce Emissions programme". For the purposes of this paper, the distinction between project schemes and offset trading is that offset credits are used in conjunction with a system of emissions trading that creates obligations for emitters in a particular sector or sectors.

There are a number of ways to trade in offset credits. One is to design a trading scheme, such as cap and trade or baseline and credit, and allow for offset credits to enter this market. This is a common feature of emissions trading schemes and effectively means certain types of offset credits have the same value as an emissions allowance.

In general allowing for offset credits as part of a domestic trading scheme will improve both the cost effectiveness and (more contentiously) the environmental effectiveness of the scheme. Allowing for offset credits broadens the scope of a domestic trading scheme, which reduces compliance costs for the sector facing the cap and, in theory, leaves net emissions unaltered. Trading in offset credits can also help to encourage emission reductions from sectors that are not as well suited to a cap and trade regime.

Concerns about allowing for offsets credits as part of a trading scheme are that they will weaken the incentive for emission reductions with the capped sector itself. However most concerns about the use of offsets are linked to concerns about whether the activities for which the credit is given are in fact creating real emission reductions (or removals in the case of sequestration projects).

A second option would be to create a market that trades solely in offsets by requiring some or all of the greenhouse gas emissions from a sector to be met solely by offsets from a particular sector or sectors.

6.2 Implementation issues

In addition to selection of a trading model, key issues to consider for implementing an emission trading system include:

Coverage of the scheme and points of obligation

The larger a trading scheme, the greater the opportunities to seek out least-cost emission reductions. However, larger systems are also more administratively complex, which can increase transaction costs. Some sectors may be better suited to emissions trading than others.

Within trading sectors, the “points of obligation” for surrendering emission allowances to cover emissions can be defined at the level of the upstream source of an emitting product (at points of production or supply of fossil fuels), at the level of the downstream emitter or user of a product, or at points in between. Using upstream points of obligation is the easiest approach to administer, as it involves the fewest parties.

In the longer term, it is likely to make sense to apply either upstream points of obligation or a combination of upstream and downstream points of obligation in different sectors, depending on factors such as administrative and compliance costs and the relative mitigation incentives created at different points of obligation. One consideration is the extent to which cost-effective behaviour to reduce emissions is influenced by direct obligations to surrender emission allowances versus price signals passed down through the supply chain. For example, if the government were to consider a limited trading scheme for large direct emitters in the electricity generation and industrial sectors before 2012, it could be feasible to apply a downstream point of obligation as only a limited set of consumers of most fuels or other emitting inputs would be subject to the scheme. In large trading systems, applying downstream points of obligation becomes increasingly complex to administer.

Competitiveness-at-risk/international leakage

The same basic decisions about an acceptable level of cost to impose on businesses and issues of international competitiveness and leakage can arise under emission trading regimes as under a greenhouse gas charge regime. However, emissions trading also offers benefits such as increased flexibility in compliance and opportunities for least-cost mitigation. The overall stringency of the cap, methods of allocating emission allowances (such as gratis allocation or auctioning of allowances, or use of a fixed price), the stringency of non-compliance penalties, price control (safety valve) mechanisms and wider market linkages can reduce the cost of the system to emitters and limit the risk of international leakage of emissions.

Using linkages/safety valves

At some level, an emissions trading scheme requires an overall cap to achieve the desired environmental outcome. However, such a cap can potentially be set at an international level, and does not need to be further defined at a national or sectoral level. For example, in the case of Annex I countries that have ratified the Kyoto Protocol, an international emissions cap is defined as the total number of assigned amount units allocated for 2008 to 2012.

For firms within the cap, emissions trading is intended to enable access to least-cost mitigation opportunities. This objective is most likely to be achieved where there are many diverse sources of allowances, the supply of allowances exceeds demand, transaction costs are not prohibitive, and pricing is transparent. In market situations where demand for allowances exceeds supply, the acquisition of allowances is mandatory or there are limited suppliers, the market price for allowances is likely to be set either by the marginal cost of mitigation or the non-compliance penalty – whichever is lower.

Under those conditions, sellers will inflate the sale price of allowances relative to the actual cost of mitigation. The result will be that least-cost mitigation opportunities in the economy will be funded, but the financial benefits will accrue to suppliers, and buyers may not realise substantial cost savings relative to the marginal cost of abatement.

New Zealand could consider setting its own absolute cap on a national or sectoral basis for a domestic emissions trading system. This approach would create an incentive for resources to move to lower-emission uses within the economy, which is one of the objectives of a trading system. However, it could place a cost constraint on production by limiting emitters' access to least-cost mitigation opportunities outside of the cap.⁹ It could also constrain the liquidity of the domestic emissions trading market, given the small size of the New Zealand economy and the limited number of large direct emitters.

To avoid these issues, New Zealand could design a more flexible national or sectoral emissions trading scheme. One option would be to link a domestic trading scheme to the Kyoto emissions trading market (through trading of assigned amount units, emission reduction units from joint implementation projects or certified emission reductions from clean development mechanism projects). A second option would be to link a domestic trading scheme to other countries' emissions trading schemes, such as the European Union Emissions Trading System. A third option would be to build in other safety valve measures such as the use of project-based allowances/offsets, linkages to other sectoral climate change programmes, or price protection (such as making allowances available for purchase at a set price or setting a relatively low financial penalty for non-compliance). These options could be designed to preserve the environmental integrity of the trading system while enabling greater market liquidity and reducing the costs of compliance.

Method of allocation of allowances

A number of methods could be used to make an initial allocation of allowances to participants in an emission trading scheme, including:

- gratis allocation of allowances to emitters. This could be done on a number of bases, including: grandparenting allowances to existing emitters on the basis of historic emissions, or providing allowances to emitters on the basis of projected emissions
- providing allowances to participants in a particular industry up to a benchmarked level of emission performance

⁹ This depends on whether reducing emissions domestically is cheaper than reducing overseas emissions.

- auctioning
- hybrid gratis allocation/auction regime
- a requirement to purchase emission allowances, such as project-based allowances or offsets.

Auctioning emission allowances offers some important benefits over gratis allocation. It is considered more economically efficient. Under a pure auction, emitters would simply purchase allowances to cover their emissions liability – the government would not determine which emitters would have preferential access to allowances, and on what basis gratis allowances would be awarded. There would be no need to separately consider crediting for early action to reduce emissions – top performers would be rewarded automatically by needing to purchase fewer allowances than poor performers. Auctioning would generate revenue that could be recycled back into the economy so that the measure became revenue neutral for the Crown.

The concept of gratis allocation of emission allowances is ingrained in the Kyoto Protocol in the allocation of assigned amount units to Annex I countries. Gratis allocation of allowances can mitigate the adjustment cost of assuming emission reduction obligations under a trading regime, and address competitiveness-at-risk impacts from exposing firms to a price on greenhouse gas emissions before their international competitors. It can also be a powerful tool for engaging emitters to participate in emissions trading.

However, as demonstrated by the European Union Emissions Trading System, gratis allocation processes can be complex and time consuming to design and implement. Allocated allowances have a market value and constitute an asset to emitting firms. Gratis allocation can introduce significant market distortions. Surrendering allowances to cover emissions has an opportunity cost, so emitting firms that receive gratis allowances may still choose to pass the full price of their emissions on to consumers. Gratis allocation schemes may help reduce the burden of adjustment costs of emissions pricing on producers, but not on consumers. The complexities involved when using grandfathering or other methods of gratis allocation may make it necessary or desirable to determine the allocation of emission allowances well before the trading scheme begins.

An important consideration in the design of allocation schemes is allowance allocation on the basis of absolute emissions versus emissions intensity. Allowance allocation on the basis of absolute emissions involves some underlying assumption about the level of production, whereas allowance allocation on an intensity basis enables the allocation to adjust automatically to fluctuations in production. If an emissions cap is designed on an absolute basis but allowance allocation is done on an intensity basis, some mechanism will be needed to translate the absolute cap into an intensity metric. Allowance allocation on an absolute basis drives decision making around marginal increases in production, while allowance allocation on an intensity basis influences decisions on the average cost of production.

Example of intensity-based allocation: Holcim Group proposal for performance-based allocation for European Union emissions trading

The absolute volume of Allowances (A) allocated to a sector would be based on a Performance Standard (PS) multiplied by Production Volume (PV).

The allocation would be in two steps:

First, an allocation to the sector:

$$A_{\text{sector}} = PS_{\text{sector}} * PV_{\text{sector}}$$

Second, a pro rata distribution to all installations in the sector based on the production volume of each installation:

$$A_{\text{installation}} = A_{\text{sector}} * (PV_{\text{installation}}/PV_{\text{sector}})$$

In the first step, Production Volume would be determined by a forecast of future production based on historic trends. In the second step PV would be based on historical production from an installation (plus new entrants), to prevent speculation and increase transparency.

The Performance Standard would be determined by the sector's average emissions per unit of production for a reference period. Effectively, below average performers in the sector would be required to improve their performance or to purchase emissions allowances from above average performers in the sector. A percentage improvement would be applied to the PS over time, requiring overall sectoral improvements in efficiency over time.

Allowances would be delivered to participants at the beginning of the year (or other period), with an adjustment at the end of the year to allow for changes in actual production.

The above is a summary and comment on some features proposed by Holcim Group for emissions trading in the European Union as part of a series of position papers on climate change. More details can be found at:

www.holcim.com/sustainable/

Market entry and exit issues

Under some methods of allocation of emission allowances (particularly where emissions are grandfathered to emitters on the basis of historic emissions), new entrants to an industry may face barriers while existing parties may receive windfall gains. For example, making allowances available to existing participants but not new entrants will create a potentially prohibitive cost disadvantage for new entrants, which will have to buy allowances to match their emissions. One solution would be to set aside a reserve that could be allocated to new entrants on the basis of a reasonable level of emissions for their projected production. In the case of grandfathering on the basis of historic emissions, existing participants leaving the New Zealand market could also receive windfall gains as they would no longer have emissions from production and their allocation of units would be available for sale. To the extent that this production was displaced to other countries outside the trading system, the environmental value of these allowances would be negated by increased emissions in other countries. A possible response would be to require the return of allocated allowances to the government when a plant was closed down. Alternatively, a dynamic baseline under a baseline and credit system could potentially solve these issues.

Compliance, banking and borrowing mechanisms

The environmental integrity and market effectiveness of an emissions trading scheme must be enforced through a compliance regime. Firms could fail to comply by emitting more than their allowance holdings or by failing to meet their monitoring and reporting requirements. Non-compliance penalties could take many forms, including monetary fines, a requirement to purchase and surrender additional allowances, the assignment of a more stringent target in future compliance periods or restricted trading access in future periods.

Enabling banking of emission allowances and borrowing of allowances from future periods could create some flexibility in compliance. Under a banking mechanism, firms with excess emission allowances relative to their emissions over a given compliance period could retain those allowances for use in future periods. This would give firms an incentive to over perform against their current target. Under a borrowing mechanism, firms could borrow allowances from their future allocation in order to meet their allowance requirements in the current period. These mechanisms could become complex if the basis for trading of emission allowances was expected to change substantially over time.

The design of the compliance, banking and borrowing mechanisms could play an important role in influencing the market price of emission allowances. The mechanisms could also affect market liquidity and be important considerations in ensuring linked emissions trading schemes were compatible.

Questions for discussion:

- 14) Which sectors could and should be included in a New Zealand emissions trading scheme? Could this change over time?
- 15) What design conditions would be necessary for emissions trading to function effectively in the New Zealand context?
- 16) Which allocation methods would you support: gratis allocation, auctioning or hybrid allocation schemes? Why?

Additional reference materials

As outlined above, a wide range of approaches and design features could be adopted within an emissions trading system. Four emissions trading systems in other countries are summarised in Section 13. More detailed information on design features of emissions trading and approaches taken or being considered internationally can be found on a number of websites, including:

http://www.pewclimate.org/policy_center

http://unfccc.int/kyoto_mechanisms/emissions_trading/items/2731.php

<http://www.emissionstrading.net.au/home>

http://energy.senate.gov/public/index.cfm?FuseAction=IssueItems.view&issueitem_ID=33

Information on previous government consultation and background materials on emissions trading in New Zealand can be found at:

http://www.med.govt.nz/templates/ContentTopicSummary____16251.aspx

7. Greenhouse Gas Charge

A greenhouse gas charge is an environmental charge applied on the greenhouse gas emissions associated with emitting activities such as the production and/or consumption of fossil fuels. The carbon charge (later renamed the carbon tax) developed in the government's 2002 climate change policy package was intended to reduce emissions by placing a price signal on the use of carbon-based fuels, including transport fuels and electricity generation, as well as on the carbon dioxide-equivalent emissions from industrial processes. Development of that carbon tax was halted at a stage where officials were considering public submissions on an implementation issues consultation document. Nonetheless, many technical matters had been resolved and could be applied in a new greenhouse gas charge regime. These include issues such as emission factors (particularly for coal types, natural gas streams and geothermal energy), definition of points of obligation, treatment of fugitive emissions and administrative issues.

Examples of international carbon charges

Several examples of carbon charges operate overseas, apart from the plethora of energy taxes used for reasons other than to incentivise greenhouse emission reductions. As mentioned above, the UK has a climate change levy applied to energy use in specific sectors. This levy runs alongside a negotiated agreements programme, a domestic emissions trading system and the European Union Emissions Trading System. Sweden, Norway and Denmark have carbon charges with varied scopes, rates and methodologies. Switzerland has an industry-levied "Climate Cent" programme on transport fuels with revenue recycled to fund mitigation projects at home and abroad. This is in addition to the national CO₂ levy on stationary fuels primarily used in industrial processes and domestic heating.

For more on Switzerland's Climate Cent, see this website:

<http://www.stiftungklimarappen.ch/klimarappen/shop/store/navi30/index.asp?l=4>

The IEA has a useful policies and measures database that can be searched for energy and carbon tax regimes: <http://www.iea.org/textbase/pamsdb/search.aspx?mode=cc>

A broad-based greenhouse gas charge, along with broad-based emissions trading, could potentially be applied across all sources of emissions in the economy, including the energy, transport, agriculture, forestry and waste sectors. Changing absolute and relative prices could influence investment and behavioural decisions, as well as giving incentives to develop and use new technologies. The rate of the charge and the use of associated revenue would influence the amount of emissions reduced by the charge.

There are likely to be issues involving measuring and reporting emissions within the agriculture, forestry and potentially the waste sectors with any broadly applied greenhouse gas charge.

The rate of a broad greenhouse gas charge could be set at a low level to seek minimal competitiveness and potential macroeconomic or sectoral economic impacts. However, a low rate might have only a small impact on emission growth and technology development and uptake, particularly in the transport sector, where demand is less

responsive to small price changes. The rate could be linked to an international price of greenhouse gas emissions if there was a readily identifiable market for emission allowances. It could also be set at a relatively high level on certain fuels should large improvements in energy efficiency and substantial emission reductions be sought from sectors known to be slow to react to a lower price.

A greenhouse gas charge could be combined with trading aspects to make a hybrid mechanism. For example, firms subject to a charge could retain an option to surrender tradable emission allowances in place of the charge to cover their emissions. This would provide some level of price certainty to firms while enabling them to build capacity with emissions trading.

Questions for discussion

- 17) Would a broad greenhouse gas charge be an effective policy option for reducing emissions in New Zealand post-2012?
- 18) How should the rate of any broad-based greenhouse gas charge be set? Should it vary by sector, and if so, on what basis (the relative ease of mitigating emissions, the availability of alternative technology or the effect on emitters' decisions)?

8. Other Regulatory Approaches

A legislative vehicle will be needed to enshrine mechanisms behind any emissions trading scheme, greenhouse gas charge or compulsory aspects of voluntary agreements. Such mechanisms could include establishing emission caps or constraints, a competitiveness-at-risk assessment process (in order to qualify for charge rebate or exemption), non-compliance penalties, quantification tools and reporting regimes. Some short-term regulatory approaches are being considered under sectoral work programmes. This section looks at two other regulatory measures for controlling greenhouse gas emissions in the period after 2012: the Electricity Act 1992 and the Resource Management Act 1991 (RMA).

One option to control greenhouse gas emissions would be to amend the Electricity Act 1992. It could be amended to expand the range of regulation-making powers to include the power to ensure the investment decisions of new thermal generation projects account for a price of greenhouse gas emissions, or to require carbon to be captured and sequestered or offset through planting or other abatement projects. These options are explored further in the draft New Zealand Energy Strategy.

Regulation Example: New South Wales Greenhouse Gas Abatement Scheme

The Greenhouse Gas Abatement Scheme (GGAS) is an abatement-focused emissions trading scheme which places obligations on electricity retailers and some other buyers and sellers of electricity to offset a portion of the greenhouse gas emissions associated with their electricity purchases. GGAS's objectives are to reduce the emissions associated with the generation and use of electricity and to develop and encourage activities to offset emissions.

The scheme, which has been operating since 2003, sets an annual state-wide greenhouse gas benchmark for the sector. Allocation is determined by the share of the electricity market.

Offsets, or abatement projects, can be applied in supply-side activities, such as low emissions generation or improving the efficiency of existing generation, or in demand-side projects that reduce electricity consumption. Large users of electricity can apply to have their reduction of production emissions count as offsets. Finally, carbon sequestration can be used as abatement.

GGAS was established by New South Wales electricity legislation and regulations which set out rules and eligibility criteria, and create and transfer certificates. The regulatory and administrative body has produced three annual reports which show increasing numbers of abatement projects being assessed and accredited, and progress towards reducing the average emissions intensity of supplied electricity.

More information on GGAS can be found at:

<http://www.greenhousegas.nsw.gov.au/>

A second option would be to use various mechanisms under the RMA, which at present prevents local authorities from considering the effect on climate change from local emissions of greenhouse gases.

The government could develop three policy instruments as transitional and long-term policy tools. Firstly, the RMA could be amended to restore local government's ability to consider the impact on climate change from local greenhouse gas emissions through plans and air discharge consents. At the time of this publication, this change is being sought by the Resource Management (Climate Protection) Amendment Bill before the Local Government and Environment Select Committee. Local government did have these powers until 2004, when the government decided to amend the RMA and remove them. At the time, a national economic instrument, the carbon charge, was the government's preferred option for controlling greenhouse gas emissions¹⁰. The RMA could also be used to manage land-use changes that impact on greenhouse gas emissions.

Another possible RMA regulatory instrument to manage greenhouse gas emissions is a National Policy Statement (NPS). An NPS is a mechanism for providing national policy guidance to local authorities on matters of national significance. Once policy statements and plans have been approved, local authorities must ensure they meet the requirements of an NPS. For an NPS to be developed in respect of greenhouse gas emissions, the RMA would have to be amended. An NPS can set out objectives and policies that local authorities must "give effect to" in their local and regional policies and plans, and which they must have regard to when making decisions on individual development projects. The one NPS now in operation is the New Zealand Coastal Policy Statement.

A third possible RMA instrument method is the use of National Environmental Standards (NESs) to control greenhouse gas emissions at the point of source. NESs sets mandatory bottom-line or maximum-setting regulations that apply nationally, although councils may be given discretion to impose additional controls. NESs are regulations that can override local and regional rules, and can specify the performance standards required in relation to specific activities or specify how particular activities are to be regulated at local or regional level. More information on NESs can be found on the Ministry for the Environment's website:

<http://www.mfe.govt.nz/laws/standards/index.html>.

National Environment Standard Example: Ambient air quality

This 2004 RMA regulation set limits on the concentration of certain air quality contaminants within prescribed time periods in urban areas. It describes monitoring and reporting requirements as well as setting out "paths to compliance" for local air quality that should be referred to when considering air discharge consents. The standard allows for offsets, where either the regional council or the proponent of an activity that would otherwise breach various contaminant concentration limits carries out an "offsetting" emission reduction activity elsewhere in the airshed. Further policies on this mechanism are being developed.

For more information on this standard see:

<http://www.mfe.govt.nz/laws/standards/air-quality-standards.html>

¹⁰ Background on the Cabinet decision can be found in this Cabinet paper: <http://www.climatechange.govt.nz/resources/cabinet/pol-02-146.pdf>.

On a generic basis, it appears possible to draft NES regulations to control point-source greenhouse gas emissions. NESs could require participation in an emissions trading or offset scheme administered by a central agent, although this regulation would have to be carefully worded to avoid the risk of double controls on emitters at the local level and through the national trading system

The above analysis shows there are two viable options under the RMA, as an amendment to the RMA without guidance through an NES or NPS would be unlikely to meet any tests of environmental or economic integrity or administrative simplicity. The problems faced by consent authorities and air discharge resource consent applicants before the 2004 amendment would reoccur and possibly be made worse by the increased attention being given to climate change issues.

The first viable RMA option is to use multiple NESs across a range of sources of greenhouse gas emissions. The second is to use the RMA through amendment and some form of national guidance such as an NPS and accompanying NESs. Both options devolve at least some responsibility for controlling emissions to local authorities, and would be difficult to apply to large numbers of small direct sources of emissions, such as in the transport, agriculture and forestry sectors. The use of short-term RMA controls in the agricultural and forestry sectors will be explored by the relevant sectoral work programmes, which will note that there are co-benefits from requiring particular emission controls or offsets, such as increased afforestation, improved water quality and riparian management. Extending RMA controls to other sectors through an NPS or NES could increase these co-benefits.

Question for discussion

- 19) Is it desirable to apply RMA controls on greenhouse gas emissions because of their impact on global climate change?

9. Emission Reduction Agreements

An emission reduction agreement (ERA) is defined as a commitment with the government for a firm or sector to manage its emissions or meet specified targets over a defined period. Such agreements have been used as a climate change policy tool in some countries, and have covered a broad range of types of commitments, levels of stringency and sanctions relating to participation and compliance. New Zealand implemented a programme of voluntary agreements for major emitters from 1994 to 2000. Negotiated Greenhouse Agreements (NGAs) were also a commitment programme forming the basis of rebates or exemptions for competitiveness-at-risk (CAR) firms.

Terminology varies around the world. For the purposes of this paper, ERAs are defined as agreements in which a commitment is the primary policy tool. The processes and practical issues encountered in an ERA context are also relevant for the possible use of an NGA-like commitment to offer relief to firms that are CAR in the context of a policy that imposes costs. Agreements might form the basis of exemptions or rebates as relief from a price measure for CAR firms. They might be used in a similar way as relief from regulations that impose a cost on emitters. Finally, regulation could be used to mandate participation in a commitment scheme.

There are three possible types of ERAs: mandatory agreements, voluntary agreements, or agreements with voluntary entry but binding consequences. Binding consequences could range from a requirement to publicly report and explain non-performance under the agreement through to financial penalties such as a requirement to pay for emissions in excess of target. There could also be a tradable benefit for performance that betters an agreed target.

Given the various types of goals or objectives that might be agreed for the industry and energy sectors, commitments could be expected to take one or more forms. They might be specified in terms of absolute greenhouse gas emissions in each year, emission intensity, or energy efficiency. Less direct measures are also possible, such as assurance that best available technologies are being used or that a marginal “shadow price” for GREENHOUSE GAS emissions is being incorporated into decision-making. Finally, building the skills and processes needed for firms to participate in emissions trading might be seen as a goal in itself, and commitments might relate to this goal.

The level of ambition for the commitments made is an important issue for credibility and for equity between participants. It is inherently difficult to set and to assess, but could be affected by the design of any programme. This would also be driven by the goals for the programme and for the sector.

A wide range of processes and tools could be used to establish a target. For example, target setting could be by negotiation between the Crown and the participating firm or sector through an energy audit and an agreement to implement cost-effective measures, or through a requirement to meet some standard of best practice for the participant’s plant.

Processes and tools would also be needed for monitoring, verifying, and reporting compliance with commitments over time. Firms or sectors with commitments might be

required to report their greenhouse gas emissions against ISO 14064 or some other agreed standard.

There would be challenges in ensuring that commitments and their delivery are equitable enough to avoid a situation where some firms are inadvertently penalised by additional cost when they make and deliver challenging commitments, while competitors are seen as “free-riding”.

If entering a programme and accepting a commitment were both voluntary, firms would need some motivation to participate. Possible incentives could include a connection to any longer-term price measure and its approach to competitiveness issues. Participants would benefit from increased internal attention being given to energy and emissions efficiency and early consideration of the influence of greenhouse gas emission pricing on production and investment decisions.

For example, firms that participate in a voluntary agreement could have either their target or their achievements recognised in a subsequent free allocation to CAR firms. Firms that participate and meet their commitments could be assured their allocations would be based on a different formula or on their monitored achievements. This could be regarded as credit for early action – a framework for firms to record achievements to ensure that subsequent allocations do not penalise actions taken before the allocation decisions are made. Recognising credit for early action does not necessarily mean that a broad price-based measure could not be introduced before the agreements ended.

A more generalised incentive would also be possible, such as the government deciding up front that if firms in a particular sector did not participate in a voluntary programme, some mandatory alternative would be implemented in the sector instead.

Questions for discussion

- 20) What conditions would be required for emission reduction agreements to be used as an element of post-2012 climate change policy?
- 21) What methods could be used to ensure that emission reduction agreements were sufficiently ambitious to meet government goals, and the commitments made would be met over time?
- 22) What process could be used to develop emission reduction agreements for major direct emitters?

Examples of Commitment Programmes Internationally

The New Zealand government negotiated voluntary agreements with major energy and industry firms between 1994 and 1998, with targets for emissions up to 2000. The incentive for firms to accept ambitious commitments was the government's stated intention to implement a carbon tax in 1997 if emissions were not on track. France, Germany and other European countries implemented similar agreements in the 1990s, while those in the Netherlands and Denmark had more significant incentives with carbon and energy taxes already in place.

Governments in the United States, Canada, Britain, Australia and other countries have run corporate commitment and registry programmes in which firms make commitments to manage their emissions (and/or energy efficiency) and report over time. Reporting may be based on firms' emissions inventories, or may be on projects or improvements they have made. While these programmes are sometimes very elaborate, they do not include specific emission targets with consequences for the firms.

NGAs were an example of a voluntary agreement with mandatory consequences. Under NGAs, New Zealand firms whose international competitiveness would have been affected by the carbon tax could apply to negotiate an agreement with the Crown whereby they received a full or partial exemption from the tax in exchange for agreeing to move towards the world's best practice in emissions management. The objective of the NGA policy was to mitigate the risk of economic production moving (or "leaking") from New Zealand without any corresponding global reduction in greenhouse gas emissions. NGAs also sought to reduce emissions or the intensity performance of applicant firms to assist New Zealand in meeting its Kyoto obligations from 2008 to 2012. The Crown has NGAs with Oceana Gold Ltd and the New Zealand Refining Company.

For more information on emission reduction agreements, refer to:

LBNL, 2005. *Voluntary Agreements for Energy Efficiency or GHG Emissions Reduction in Industry: An Assessment of Programs around the World*
<http://ies.lbl.gov/iespubs/58138.pdf>

UNEP, 1998. *Voluntary Initiatives* – various articles
<http://www.uneptie.org/media/review/vol21no1-2/vol21no1-2.htm>

10. Comparison of Options

The previous sections of this discussion paper have outlined a number of options that could be considered for longer-term measures to manage greenhouse gas emissions in the New Zealand economy. Those options have been described without reference to the relative strengths and weaknesses of the other possibilities. The purpose of this section is to ask some comparative questions that will enable officials to collect perspectives around the relative merits of the following options for policy after 2012:

- emissions trading (across key sectors or economy-wide)
- greenhouse gas charge (across key sectors or economy-wide)
- regulation (RMA or Electricity Act)
- emission reduction agreements (mandatory or voluntary).

Other important categories of measures include financial incentives, such as capital subsidies, tax incentives, financing programmes, or preferential pricing schemes, and information and education programmes. As noted elsewhere in this paper, the government expects a mix of sectoral and economy-wide measures may be needed to integrate New Zealand's sustainable development objectives. The measures listed above are not the only steps being considered by the government and are not intended to exclude other types of measures that could be adopted on a sectoral or economy-wide basis.

Questions for discussion

- 23) What national and/or international circumstances would favour emissions trading rather than greenhouse gas charges applied broadly or more selectively across multiple sectors of the New Zealand economy post-2012?
- 24) Would a price measure be sufficient to achieve the following types of climate change-related objectives: accelerated uptake of highly efficient technologies, development and commercialisation of new technologies, fuel switching to low emissions or renewable energy sources, and reduced energy demand?
- 25) Under what circumstances should a regulatory approach be used in place of price-based measures such as emissions trading, a greenhouse gas charge or financial incentives?

11. The Path Forward for Longer-Term Policy Development

11.1 Decisions on longer-term measures in New Zealand

Major decisions to be made on implementing measures after 2012 include:

- defining the architecture of the measure or combination of measures to be introduced, such as emissions trading, a greenhouse gas charge or a hybrid measure
- defining the stringency of measure(s) (ie, what level of emission reductions should be required, or how much cost should be imposed on a particular sector or the economy as a whole)
- determining when to introduce the measure(s) in the economy generally and/or in particular sectors. The uncertainties for the longer-term international policy environment and New Zealand's sustainable development goals create a number of challenges for timing and process when developing climate change policy.

A key question is the extent to which these decisions can or should be made now or left for future decision. To the extent that there are uncertainties in future conditions, it will be desirable to allow flexibility in the development of any measure to adapt to those conditions, and/or allow for conditionality in when or how stringently any particular measure might be applied. However, specifying measures clearly now provides greater certainty for investment and business planning and better guidance for the development of transitional measures.

Two possible approaches to this question, for the purpose of discussion, are:

- a) To define the architecture of the measure now but leave decisions about the stringency and the scope of the measure (ie, which emitters or sectors would be covered) until key uncertainties, particularly the nature of the international policy framework, are clarified. For instance, a decision could be made to apply an emission trading measure in the future, but to delay deciding on the scope of coverage of this system and the stringency with which it would apply until the international situation was clearer. This would allow development of general design features of the measure to commence now, and allow time for those likely to participate to build capacity. This approach would also provide some clarity of the future path for climate change measures.
- b) To outline a set of principles for when a measure would be applied and how stringently, but not to specify either an actual measure or measures until the international situation is clearer. While allowing greater flexibility, this approach would provide less clarity and certainty as to the future path for climate change measures.

A number of different approaches or combinations of approaches can be taken to making the sequence of required decisions to introduce a longer-term measure.

11.2 Indicative proposal for discussion

The following is an indicative proposal for a path forward for climate change policy for the purposes of discussion. This proposal attempts to integrate some of the considerations addressed in this paper. **This is not a government policy proposal or preferred approach. It should not be interpreted as a reflection or prediction of government policy.**

The following decisions could be taken by the government in 2007 to provide clarity and increased certainty around the future framework for climate change policy, and to guide the selection of transitional measures.

- The government would introduce a broad price-based measure for New Zealand at some date not earlier than 2012 and when international conditions were appropriate.
- The types of conditions that would support the introduction of a broad price-based measure could include, among other things, the following:
 - New Zealand assumes a target, or otherwise participates, in an international climate policy framework, whether on a national or sectoral basis;
 - The measure does not have a significant detrimental impact on the international competitiveness of New Zealand's key producers because it expressly assumes most of our competitors would be doing something similar;
 - New Zealand can use the measure to access least-cost emission reduction opportunities, both globally and sectorally; and
 - The devolution of emissions liability and costs can be administered efficiently.
- The preferred price-based measure would be emissions trading unless future international conditions preclude the use of emissions trading.
- Mitigation measures for major emitters implemented prior to 2012 should be consistent with a later move to a broad price-based measure.
- More specifically, these measures for major emitters should build their capacity to measure, monitor and report their emissions; build their capacity to trade emissions allowances domestically and internationally; and signal the need to factor the cost of greenhouse gas emissions into future investments.
- Prior to the introduction of a broad price-based measure, mitigation measures for major emitters should encourage low-emitting or carbon neutral investment and avoid perverse incentives to delay emission reduction activities.

Decisions to be made in the future

Decisions on a broad price-based measure

When the international climate change policy framework post-2012 becomes clearer, the government would decide the following:

- when to move to a broad price-based measure, either across the economy or for selected sectors over time;
- what the broad price-based measure would be (emission trading or greenhouse gas charges), noting the preference for emissions trading if conditions were appropriate; and
- how stringent the measure would be (eg, in the case of emissions trading, the allocation methodology, the option to use domestic and international flexibility mechanisms, and/or the level of non-compliance penalties), depending on New Zealand's strategic climate change goals and the stringency of obligations faced by other nations.

These are unlikely to be simple decisions. The future international situation is currently uncertain and may be complex. It may be appropriate to move to a price-based measure in some sectors sooner than others, although the ultimate goal would be to move to a broad emission trading system that allows access to least-cost emission mitigation opportunities. A mix of price-based and other measures may continue to be appropriate in the longer term.

Conditions for decisions on a future broad price-based measure

The following factors could be considered in making the decisions above:

- The stringency of obligations taken on by other nations or by sectors in other nations.
- The breadth of coverage of international measures, particularly the coverage of nations that compete with New Zealand in international markets.
- The consistency and nature of measures applied internationally. In other words, whether there is a particular measure, such as emissions trading, that is used widely internationally and creates an identifiable and accessible international price for greenhouse gas emissions, or whether a more piecemeal set of measures is applied.
- The availability of access to international emissions trading markets or other international flexibility measures.

Question for discussion

26) What are your views on the indicative proposal for discussion?

12. Glossary

Many of the definitions have been sourced from the GHG Protocol Initiative's glossary, which can be found at: <http://www.ghgprotocol.org/glossary.htm>.

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

Clean development mechanism (CDM) : A Kyoto Protocol mechanism that allows emission reduction and afforestation/reforestation projects with sustainable development benefits to be implemented in developing countries that have ratified the Kyoto Protocol. CDM projects earn particular Kyoto units that can be used by an Annex I Party such as New Zealand to help meet its Kyoto commitment.

Carbon dioxide equivalent (CO₂e): The quantity of a given greenhouse gas multiplied by its global warming potential, which equates its global warming impact relative to carbon dioxide (CO₂). This is the standard unit for comparing the degree of warming which can be caused by emissions of different greenhouse gases.

Carbon tax A tax applied to CO₂-equivalent emissions of certain major greenhouse gases. The government's 2002 climate change policy package included a carbon tax on energy, industrial and transport emissions, capped at \$25 per tonne of carbon dioxide equivalent (CO₂e). In December 2005, the government decided not to proceed with the announced carbon tax.

Competitiveness-at-risk (CAR): Being in the position where bearing a price for greenhouse gas emissions significantly impedes a firm's ability to compete against international competitors in countries with less stringent climate change policies. Such competition could be on the basis of exports or imports.

Commitment period: A range of years within which Parties to the Kyoto Protocol are required to meet their greenhouse gas emissions target, which is averaged over the years of the commitment period. The first commitment period is 2008-2012. The targets are set relative to greenhouse gas emissions in the base year (in New Zealand's case, 1990), multiplied by five.

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

Emissions: The intentional and unintentional release of greenhouse gases into the atmosphere.

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

Emission unit or allowance: A tradable unit representing the right to emit one tonne of CO₂ equivalent emissions. See the Climate Change Response Act for a legal definition of emission units in the New Zealand context.

Emissions (or environmental) leakage: The shift in emissions (and other environmental impacts) from one country to another associated with economic activity being displaced from one country to another. If reduced production (and emissions) in one country results in increased production (and emissions) in a competing country, then there is no global emissions benefit.

Exemption: A waiver from bearing an obligation under a policy measure. For example, under the former carbon tax and NGA regime, NGA firms were to receive a full or partial exemption from the carbon tax that would otherwise have applied to their direct emissions of greenhouse gases.

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

Global warming potential (GWP): A factor describing the radiative forcing impact (amount of warming) of one unit of a given greenhouse gas relative to one unit of CO₂. For example, under the Kyoto Protocol, the GWP of methane is 21.

Greenhouse gas (GHG): Greenhouse gases are constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation. Greenhouse gas emissions covered by the emissions limitation or reduction commitment for the first commitment period of the Kyoto Protocol are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆).

Inventory: A list of an organisation's or a country's greenhouse gas emissions by sources, removals by sinks, and stocks.

Joint implementation (JI): A mechanism that allows emission reduction and removal projects to be implemented in Annex I Parties that have ratified the Kyoto Protocol. JI projects earn particular Kyoto compliance units known as Emission Reduction Units that can be used by an Annex I Party to help meet its Kyoto commitment.

Kyoto Protocol: A protocol to the United Nations Framework Convention on Climate Change that requires ratifying countries listed in its Annex B (industrialised nations) to meet greenhouse gas reduction targets during the period from 2008 to 2012 (see <http://unfccc.int> for further information).

Mitigation: Any action that results, by design, in the reduction of greenhouse gas emissions by sources or removals by sinks. Mitigation and abatement are considered equivalent terms in the context of this paper.

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

Negotiated Greenhouse Agreements (NGAs): Under the government's 2002 climate change policy package, NGAs were available to eligible firms whose international competitiveness would be placed at risk by the carbon tax. Eligible firms were to receive full or partial relief from the carbon tax in return for moving toward world's best practice in greenhouse gas emissions management. In December 2005, the government decided not proceed with the carbon tax/NGA regime.

Pass-through: In this paper, the increase in the consumer price of a product resulting from the imposition on the producer or supplier of a price for the product's greenhouse gas emissions.

Price-based measures: Also referred to as “economic instruments” and “market instruments”, price-based measures can be applied to integrate the costs (or opportunity costs) of greenhouse gas emissions into decision making in the marketplace, thereby influencing choices in production, consumption, and technology development. They can include pollution charges and tradable resource and pollution systems. The goals of such measures include achieving efficiency in environmental and energy policy through compliance cost minimisation, overcoming barriers of asymmetric information and encouraging technological change. The term “price-based measures” is applied most commonly to greenhouse gas charges and emissions trading, but can also include other forms of financial incentives.

Rebate: An amount intended to refund the cost of a policy measure. For example, under the former carbon tax/NGA regime, rebates were available to NGA firms to compensate them for increased electricity prices resulting from the carbon tax applied to fossil fuels.

Relief: Exemptions and rebates designed to offset the cost of a policy measure, such as a tax or other charge.

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

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

Sink: A sink actively removes a greenhouse gas from the atmosphere, such as a growing forest or soil. A sink is distinct from a place where greenhouse gases can be stored ("sequestered"), such as an underground reservoir or a mature forest.

Threshold: Criteria that define which firms, sites, or other business units are required to participate in a policy measure.

UNFCCC: United Nations Framework Convention on Climate Change negotiated in 1992. It aims to stabilise greenhouse gas concentrations at a level that avoids dangerous human interference with the climate system.

13. Examples of Emissions Trading Systems

Example One: Phase One of the European Union Emissions Trading System (EU ETS)

The first phase of the EU ETS began in January 2005, and will run until December 2007. The second phase will continue from 2008 to 2012.

Features include:

- Coverage of about 11,000 installations, which together produce over 40 percent of European CO₂ emissions in 25 countries.
- Sectors and activities included in the pilot phase are: energy activities, the production and processing of ferrous metals, the mineral industry and pulp and paper production.
- Use of a cap and trade system, where EU states, through National Allocation Plans (NAPs), determine the number of allowances that each installation covered by the system receives and the total allowances required by the state. The European Commission has the power to approve or reject NAPs.
- Linking to the Kyoto Protocol's clean development mechanism and joint implementation from 2008 will expand the market further.

For the second phase of the EU ETS, further developments will be considered, including:

- Extension to other sectors (including the chemicals, aluminium and transport sectors) and emissions of other greenhouse gases.
- Harmonisation between member states of the allocation method, rules for new entrants and closures and rules for verifying emission reports.

Further information on the EU ETS can be found at:

<http://ec.europa.eu/environment/climat/emission.htm>.

Example Two: The Northeastern US States Regional Greenhouse Gas Initiative (RGGI)

The Regional Greenhouse Gas Initiative (RGGI) is a regional initiative by states in the northeastern US region to reduce greenhouse gas emissions from fossil fuel electricity generators and is proposed to start in 2009.

Features include:

- A mandatory cap and trade program for CO₂ emissions from fossil fuel electricity generators above 25MW.
- A goal to lead to a stabilisation of regional emissions from covered installations at 2005 levels by 2015, followed by a reduction in emissions between 2015 and 2018, reaching a 10 percent reduction from 2005 levels in emissions in 2018.

- State-based caps on emissions, with states to allocate allowances to individual emitters, subject to the condition that 25 percent of allowances must be allocated to consumer benefit or strategic energy purposes.
- Fossil energy generators initially able to purchase offsets from approved projects in the US to meet 3.3 percent of their emissions, with 1:1 crediting for mitigation from participating states and 1:2 crediting for projects in non-participating states.
- Offset projects that may initially be in a number of areas including landfill gas, afforestation, methane capture from farming, and end use efficiency of natural gas, propane and heating oil.
- Provision of a series of safety valves, including allowing a greater percentage of offsets (up to 10 percent), 1:1 crediting of non-participating state offsets and participation in international trading, when specified trigger price thresholds for allowances are exceeded for an extended period of time.

Further information on the RGGI can be found at:

<http://www.rggi.org/>.

Example Three: Proposed Australian States' National Emissions Trading Scheme (NETS)

The eight Australian states established a working group, later renamed the National Emissions Trading Taskforce, in January 2004 to develop a model for a National Emissions Trading Scheme (NETS). In August 2006, the taskforce released a discussion document outlining a possible design of the NETS, along with results of preliminary economic modelling. The document is the basis of broad public consultation being carried out to the end of 2007.

Features of the proposed NETS include:

- a mandatory cap and trade program for CO₂ emissions initially from electricity generation (being 43 percent of the national inventory of greenhouse gas emissions). Possible expansion of the scope of the scheme in five years' time to include emissions from all fossil fuels
- modelled scenarios including capping electricity generation emissions in 2030 at the year 2000 level (33 percent reduction from BAU), or capping 2030 emissions at the year 1997 level (43 percent reduction from BAU). The impact on national economic growth and the electricity price impacts between states were modelled (and are described in the discussion paper linked below)
- known caps on emissions for ten years, extended annually, with the upper and lower bounds of future caps ("gateways") set for at least five years after the ten-year known caps
- auctioning of permits. Generators that can show reduced profits as a result of the scheme can have some freely allocated permits in proportion to the losses. No free permits are given to new generation entrants. There is some free allocation of permits to new and existing trade-exposed, energy-intensive industries according to output levels
- any residual auction revenue to be used by individual states, possibly to minimise impact of higher electricity prices on low income consumers
- offset projects initially prioritised as forestry, industrial process emissions, geosequestration, and methane from waste treatment

- units created through the clean development mechanism would be recognised by the proposed NETS and swapped for offset units.

Further information on the NETS, including the discussion document, can be found at: <http://www.emissionstrading.net.au>.

Example 4: Proposed Energy Performance Commitment (EPC) scheme for the UK

As part of an energy review, the United Kingdom government has committed to consult on measures to cut carbon emissions from large commercial and public sector organisations by 1.2 million tonnes per year by 2020. The UK government has indicated it will put forward a proposal for an Energy Performance Commitment (EPC) – a mandatory emissions trading scheme – alongside other options for achieving carbon reduction aims for that sector.

Potential features of the proposed EPC already discussed include:

- coverage of organisations with electricity consumption on mandatory half-hour electricity meters over 3,000 MWh/year
- all energy usage by those organisations at mandatory HHM sites (but excluding usage covered by the UK Climate Change Agreements policy and the EU ETS) could be within the scheme
- allowances could be allocated by a fixed quantity auction to participants (after a one- to three-year introductory phase during which allocation would be by fixed price sale without a cap on number sold)
- allowances would be tradable. A one-way price safety valve allowing purchase of allowances from the EU ETS to meet obligations could be used
- revenue from allowance auctions would be recycled back to participants.

Economic analysis commissioned by DEFRA indicates that with revenue recycling, an EPC scheme in the UK could result in significant emission reductions and also overall net present value benefits to participants in the scheme.

Further details on the proposal can be found at: <http://www.defra.gov.uk/environment/climatechange/trading/epc/index.htm>.

Discussion Paper on Measures to Reduce Greenhouse Gas Emissions in New Zealand Post-2012

New Zealand Ministry for the Environment, December 2006

Submission Template

Please enter your responses, save the completed form to your computer,
and then email it as an attachment to climatechange@mfe.govt.nz
or send it to Post-2012, Ministry for the Environment, PO Box 10362, Wellington.

Submissions are due by 30 March 2007

Key information

Name of submitter/organisation:

Industry/area of interest/organisation type:

Contact details

Name:

Address:

Telephone:

Email:

3. Would you prefer directive regulations to a price-based measure?

4. What, if any, pre-conditions need to be met internationally and/or domestically before a broad price-based measure such as a greenhouse gas charge or emissions trading was introduced in New Zealand?

(5) Policy Development on Devolving the Cost of Emissions

(5.1) Realising least-cost mitigation opportunities

5. Under what conditions should the government support or limit the use of domestic and international flexibility mechanisms by firms or sectors with emission reduction targets or obligations?

(5.3) Leakage and competitiveness issues

6. In the longer-term, should the same price of emissions apply across all sectors of the economy? If not, how could the stringency of emission targets be determined for different sectors?

7. What measures should the government consider for managing the international competitiveness impacts of its climate change policies?

8. How might the government set a threshold for acceptable levels of competitiveness-at-risk impacts for firms subject to international competition?

9. What conditions would justify removal of any measures to deal with competitiveness issues?

(5.4) Thresholds

10. How should the government define and enforce a threshold determining which firms or sites should be included in the scheme? For example, should a threshold be defined on an intensity or absolute basis?

11. How could the government design a threshold to minimise competitiveness and equity problems?

(5.5) Revenue recycling

12. Should revenues from climate change policy measures be returned to the economy through either general tax relief or funding for targeted activities? If you believe revenues should be returned to the economy through funding for targeted activities, which activities should be considered?

(5.6) Building capacity for strategic emissions management

13. What assistance would large direct emitters need to prepare for mandatory monitoring, measurement and reporting?

(6) Emissions Trading

14. Which sectors could and should be included in a New Zealand emissions trading scheme? Could this change over time?

15. What design conditions would be necessary for emissions trading to function effectively in the New Zealand context?

16. Which allocation methods would you support: gratis allocation, auctioning or hybrid allocation schemes? Why?

(8) Other Regulatory Approaches

19. Is it desirable to apply RMA controls on greenhouse gas emissions because of their impact on global climate change?

(9) Emission Reduction Agreements

20. What conditions would be required for emission reduction agreements to be used as an element of post-2012 climate change policy?

21. What methods could be used to ensure that emission reduction agreements were sufficiently ambitious to meet government goals, and the commitments made would be met over time?

22. What process could be used to develop emission reduction agreements for major direct emitters?

25. Under what circumstances should a regulatory approach be used in place of price-based measures such as emissions trading, a greenhouse gas charge or financial incentives?

(11) The Path Forward for Longer-Term Policy Development

26. What are your views on the indicative proposal for discussion?

Additional Comments:

Thank you.

Please save the completed form to your computer and then email it as an attachment to climatechange@mfe.govt.nz, or send it to Post-2012, Ministry for the Environment, PO Box 10362, Wellington.