


# New Zealand's climate change solutions: An overview

September 2007



‘New Zealand has an enviable reputation as a country with a clean and green environment, high achieving and honest people, an inclusive community, and a commitment to peace and justice.

To maintain and build on our reputation New Zealand needs to lower greenhouse gas emissions and increase sustainability. That’s why I’ve issued the challenge that New Zealand aspire to be a truly sustainable, and even a carbon neutral nation.’

**Rt Hon Helen Clark**

Prime Minister



# New Zealand's climate change solutions: An overview

## Contents

Introduction .....	2
New Zealand's challenge .....	4
Heat and electricity .....	5
Transport .....	6
Industry and waste .....	7
Sustainable land management .....	8
New Zealand's climate change solutions .....	10
Adapting to climate change.....	16
New Zealand has sustainability – our path to carbon neutrality .....	18
Find out more .....	20
Energy .....	20
Transport .....	21
Industry .....	22
Sustainable land management (agriculture and forestry) .....	23
Waste .....	24
Households .....	25
Public sector .....	27
Other initiatives .....	28



Ministry for the  
**Environment**  
Manatū Mō Te Taiao

Published in September 2007 by the Ministry for the Environment  
Manatū Mō Te Taiao

PO Box 10-362, Wellington, New Zealand

ISBN: 978-0-478-30171-7 (print),

ISBN: 978-0-478-30172-4 (electronic)

Publication number: ME 833

This document is available on [www.climatechange.govt.nz](http://www.climatechange.govt.nz)

# Introduction

‘Just about everything we need to do in the name of climate change we want to do anyway. Better insulated homes are warmer and cheaper to heat. A more fuel-efficient vehicle fleet and better public transport mean lower petrol bills and less smog. More trees reduce erosion and improve water quality. Lower greenhouse gas emissions from industry and agriculture will improve productivity.’

**Hon David Parker**  
Minister Responsible for Climate Change Issues



Climate change, and how we deal with it, is one of the most important issues of our time.

A recent report from the Intergovernmental Panel on Climate Change confirms that past and present greenhouse gas emissions have already committed us to substantial climate change for the coming century and beyond. The same report also confirms the scale of the response required.

Much of the world's economy is underpinned by a reliance on fossil fuels.

Liberating ourselves from that dependence requires innovative thinking, and a fundamental shift in the way we live our lives – how we power our travel, how we design our homes, how we grow produce, and how we provide goods and services.

Sustainability lies at the heart of who we are as a nation, and the face we show to the world. We have a long and proud history of caring for and enjoying our environment.

New Zealanders rely on our clean green brand to obtain premium prices for primary exports and our tourism – our two largest sources of earnings. That brand is at risk from trade barriers and political consequences if we fail to take action.

[www.climatechange.govt.nz](http://www.climatechange.govt.nz)  
[www.sustainability.govt.nz](http://www.sustainability.govt.nz)



This is not just a New Zealand government initiative, it is an international reality.

Sustainability and responding to climate change are vital if we are to improve the environment for ourselves and our children. It is also vital because our actions can help bring about changes by many other nations. Keeping at the forefront of that change will help our clean and green image, which will in turn add value to the goods and services we sell.

Making the shift necessary to combat climate change requires leadership in many sectors. Businesses and communities are rising to that challenge. Every day we see more examples of innovative, climate-friendly thinking from New Zealand organisations, businesses and individuals.

Fundamental shifts are already occurring in many areas across government, and still more will follow. The full effects of these may not be felt immediately, but they will make a substantial difference over time.

Our response to climate change must help people find, and use, ways to reduce their greenhouse gas emissions.

Becoming a leader in new sustainable technologies and finding smarter ways of doing things gives us the chance of transforming our economy and improving our quality of life, as well as protecting the environment.

Many of the things we do in the name of climate change are common sense. Warm, energy-efficient homes are healthy homes. Fuel and energy efficiency saves money. Forestry reduces erosion and improves water quality.

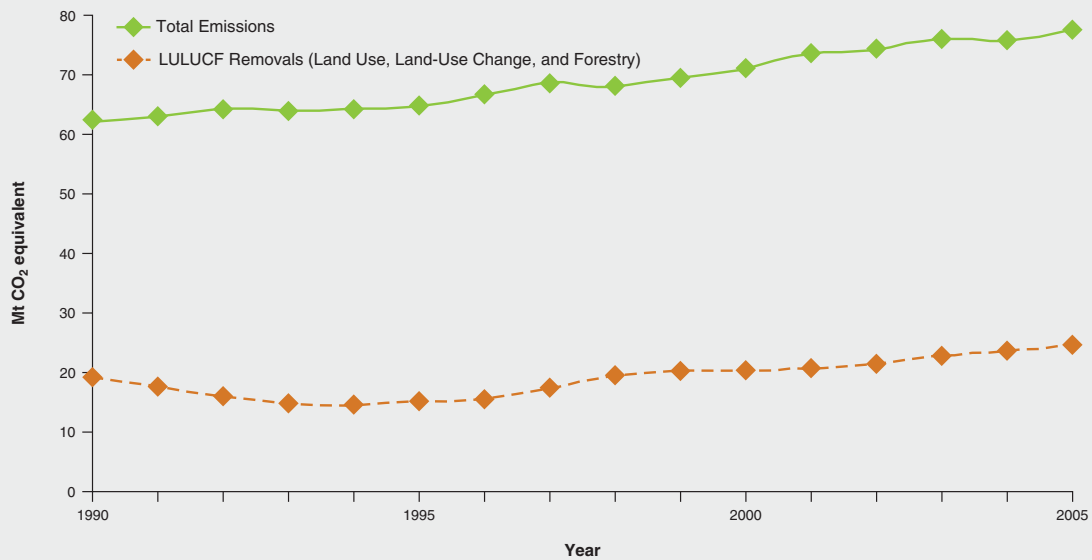
This publication sets out the challenges New Zealand faces in responding to climate change – and the solutions the government is putting in place.

It is a long path to being a truly sustainable nation but it is a path worth taking. The purpose of the policies and programmes outlined here is to start New Zealanders walking that path together.

# New Zealand's challenge

The effects of a warming planet and disrupted climate patterns are already becoming evident. The rate of change means we are at risk in our lifetimes. However, if we act now and work together to reduce our emissions, the catastrophic effects of climate change may be avoided.

Figure 1 New Zealand's total greenhouse gas emissions and removals, 1990–2005



New Zealand Greenhouse Gas Inventory 1990–2005 showed that New Zealand's greenhouse gas emissions across all sectors for 2005 totalled 77.2 Mt CO<sub>2</sub>-e, and that emissions are now 25 per cent higher than in 1990. New Zealand accounts for only a small proportion (0.3 per cent) of the world's total greenhouse gas emissions, but we have the 12th highest per capita emissions in the developed world.

## Heat and electricity

In 1990, just under 80 per cent of total electricity generation in New Zealand came from hydro, geothermal, and wind sources (renewable energy). With 35 per cent growth in electricity demand since 1990, renewable sources made up about 70 per cent of total electricity generation in 2005.

Wind generation capacity in New Zealand has grown rapidly in recent years, increasing by more than 500 per cent from 2000 to 2005 (from 119 to 610 GWh per annum). It is expected that wind generation will continue to increase substantially over the next few years.

Geothermal energy has the potential to make a significant contribution to New Zealand's energy requirements, either through electricity generation or, with even higher levels of efficiency, as a direct source of heat. In the longer term, marine energy could also play a major role.

Despite development of renewable energy supplies, there has been relatively low investment in energy efficiency for homes, office buildings, shops, and light industry and transport. There is considerable opportunity to improve the energy performance of our buildings, offering the added benefits of improved health and air quality.

Electricity demand will increase 40 per cent by 2030 and energy-related greenhouse gases (including transport) will increase by 35 per cent under a business-as-usual scenario. Given the typically long life and major capital required for energy infrastructure, it is critical that electricity generation investment decisions recognise that fossil fuels will face an emissions price in the future.



# New Zealand's challenge

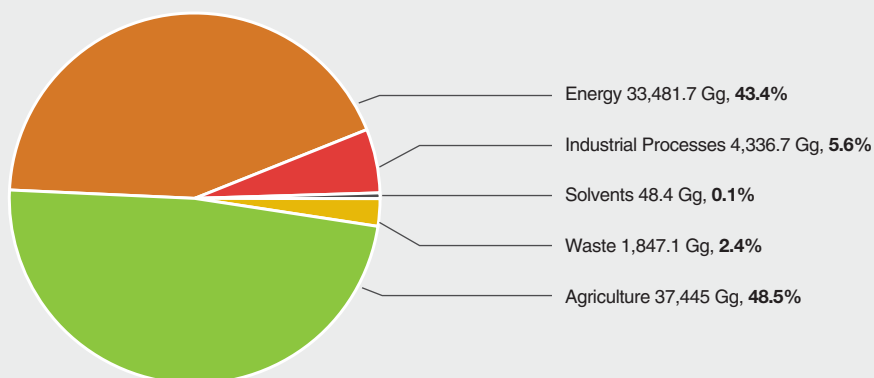
## Transport

Unless we take action our transport emissions will substantially increase. In developing actions to reduce emissions, our relatively high level of car ownership; our low, although increasing, use of public transport; and our limited rail network with dispersed cities and rugged terrain must all be taken into account.

Despite these challenges, the transport sector offers opportunities. New Zealand quickly adopts new technologies from overseas and this will soon include more fuel-efficient vehicles. The use of biofuels and plug-in electric/hybrid cars is likely to grow, complementing our strengths in biotechnology and renewable energy.

In the tourism sector growing concerns about the contribution that greenhouse gas emissions from aviation make to climate change make a proactive New Zealand strategy on this issue prudent. New Zealand faces potential risk from changes in consumer preference away from long-haul travel, and specifically away from travel to New Zealand.

Figure 2 | New Zealand's greenhouse gas emissions in 2005 – by sector (percentage of carbon dioxide equivalent)



Almost half our emissions come from pastoral agriculture, the backbone of our food exports. This presents a major challenge for New Zealand because the technology currently available will achieve only limited emissions reductions. Substantial research and technology development is essential.

## Industry and waste

New Zealand has a relatively small number of plants emitting non-energy related greenhouse gases from industrial processes. We use our natural resources where we can in the production of steel from iron sand, in cement production, and in production of ammonia, urea and lime for fertilisers. Our renewable electricity creates aluminium.

New Zealand's industrial sector faces both challenges and opportunities from climate change. The challenges relate to those industries that are emissions intensive and will need to either reduce emissions levels or face the cost of those emissions.

But there are opportunities for industries involved in emissions-reducing activity, such as developing and producing energy-efficient or renewable technologies. The challenge is therefore, to be nimble, smart and flexible in our approach.

We have made huge improvements in the way we manage waste, with emissions now 26 per cent below those in 1990. Only 10 years ago, we had 327 rubbish dumps and tips in the country. Today, we have only 90 landfills. More than 95 per cent of New Zealanders now have access to kerbside recycling collections. However, our waste will always be a problem because we keep creating it.



# New Zealand's challenge

## Sustainable land management

New Zealand's land management sectors (agriculture and forestry) are hugely important to the New Zealand economy. They are significant generators of income, representing about 65 per cent of the value of our total merchandise exports and about 17 per cent of New Zealand's total GDP – a large percentage relative to most developed countries.

The land management sectors are also of particular importance to Māori, as owners and managers of large tracts of pastoral land, farmland, and indigenous and exotic forests.

Agriculture and forestry constitute the biggest land use in New Zealand. Of New Zealand's total land area, 39 per cent is in pasture, 1.6 per cent is in horticulture and cropping, and 6.6 per cent is in planted production forest.



### Agriculture

Greenhouse gas emissions from agriculture are growing more slowly than other sectors (about 1 per cent a year), but reducing these emissions is a particular challenge.

There is a close relationship between food production and greenhouse gas emissions with limited technical solutions – particularly for methane from ruminant animals (which accounts for 31 per cent of national emissions). Nitrous oxide emissions, which make up 18 per cent of our total emissions, are more amenable than methane to technological solutions at this time.

New Zealand scientists are engaged in world-leading research to develop technologies and management practices that reduce methane and nitrous oxide emissions. This research is led by the Pastoral Greenhouse Gas Research Consortium and funded by industry and government.

Our agricultural sector presents many opportunities for New Zealand. We are capable of leading biotechnology development which could be transferred to other countries facing similar challenges.

For example, nitrous oxide emissions can be reduced by better soil and stock management and through better use of fertiliser and nitrification inhibitors. Lowering emissions this way does not affect the production of food and has the added bonus of reducing water pollution.



### Forestry

The forestry sector makes a major contribution to New Zealand's economy and environment. It is also critical to New Zealand's response to the challenge of climate change.

Forestry delivers many environmental benefits and these can help us both build a more sustainable economy and adapt to climate change.

Forests and forestry also have a major role to play in reducing greenhouse gas emissions. As trees grow, they absorb carbon dioxide from the atmosphere and store it as wood. When they are harvested, much of this carbon is released back into the atmosphere.

New Zealand's timber industry is now based almost entirely on planted forests, which cover 6.6 per cent of New Zealand's land area, but the new forest planting rate has fallen in recent years.

Globally, about 20 per cent of carbon dioxide equivalent emissions into the atmosphere come from deforestation. In New Zealand, deforestation of plantation forests has increased rapidly in recent years and this is expected to continue unless measures are introduced to actively manage the process.

Higher planting rates and managing deforestation will reduce greenhouse gas emissions. They will also improve water quality and reduce soil erosion.

# New Zealand's climate change solutions

‘New Zealand needs to do its part in the global effort on climate change. It seems inevitable that the world is moving towards a global price for carbon. The government recognises that different sectors have different abilities to reduce emissions, and we are tailoring policies accordingly.’

**Hon Dr Michael Cullen**  
Minister of Finance

New Zealand's future depends on the long-term sustainability of our economy, society, environment and culture. The quest for sustainability is now urgent because of the scale of the environmental challenge the world faces. Traditional patterns of development and fast-growing populations have put a strain on the planet.

All New Zealanders can play a part in responding to climate change. Many of us have already changed to energy-efficient light bulbs or improved the insulation in our homes. Some of our children are walking to school in “walking school buses”. More commuters are travelling on public transport. Many of our farmers are already managing their farms at, or near, world's best environmental practice.

The government has put a wide range of programmes in place to enable and encourage individuals, families and businesses to act in more environmentally responsible ways. Many of these climate change solutions have wider sustainability benefits – fewer land slips, cleaner water, cleaner air, better public health, enhanced energy security, and lower energy costs. More money is going into research.

‘We prosper when we are open to the ideas of the world and when we use them to build on our existing advantages.’

**Hon Jim Anderton**  
Minister of Agriculture and Forestry

Householders have many choices. The *EnergyWise Homes* package ([www.energywise.org.nz](http://www.energywise.org.nz)) provides a “one-stop shop” of information and shows people how to improve the energy efficiency and heating of their homes. As well as information about household products, the *EnergyWise* package will include an interest-free loan scheme for installing energy-efficient products and grants to help low-income households lower their energy costs. Already the sale of millions of energy-efficient light bulbs has been facilitated by an Electricity Commission campaign.

This is complemented by advice on the *Smarter Homes* website ([www.smarterhomes.org.nz](http://www.smarterhomes.org.nz)) and the *Warm Homes* and *Solar Water Heating* programmes. Mandatory minimum energy performance standards have been implemented by the government for many household appliances, helping ensure the products we buy are more energy efficient.

## Transport initiatives

A similar range of initiatives can be found in the transport sector. The government's *FuelSaver* website ([www.fuelsaver.govt.nz](http://www.fuelsaver.govt.nz)) and new mandatory requirements for vehicle fuel-efficiency labelling make it easier for motorists to make informed decisions about vehicle fuel efficiency.

Figure 3: New Zealand low-carbon energy scenario – stationary energy greenhouse gas emissions

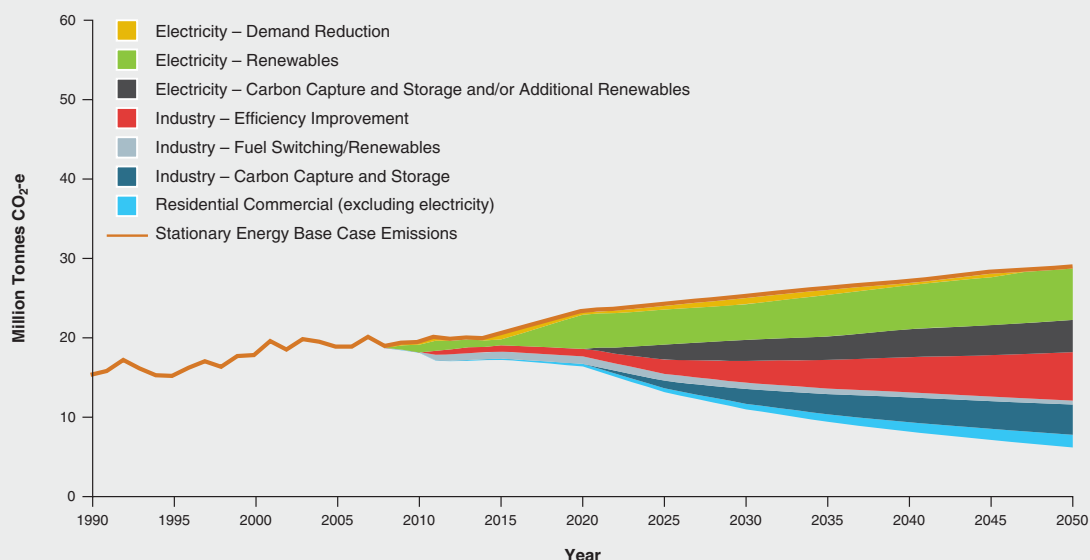


Figure 3 shows the potential emission reduction opportunities for the energy sector in comparison to business-as-usual. In the case of electricity generation, the majority of emission reductions are achieved by increasing the proportion of electricity generated from renewable sources. In later years, introducing carbon capture and storage could contribute further to reductions from electricity generation and industry.

The New Zealand Energy Strategy and New Zealand Energy Efficiency Conservation Strategy provide more detail on how we can reduce emissions from stationary energy.

The biofuels sales obligation requires 3.4 per cent of liquid fuel sales to be biofuel by 2012.

The proposed *vehicle fleet sales-weighted standard for fuel economy* will, over time, improve the overall energy efficiency of the New Zealand vehicle fleet. In addition, the establishment of the vehicle exhaust emissions rule in 2008 will promote the introduction of newer vehicle technology by imposing tighter emission standards for new and used vehicles entering the fleet.

These initiatives will be underpinned by \$900 million additional investment in public transport from 2006–2010, including significant upgrading of rail infrastructure in Auckland, Wellington and nationally.

### Sustainable land management

A critical part of the New Zealand response to climate change is in sustainable land management (agriculture and forestry).

Our farmers are already among the most efficient in the world, but agricultural emissions make up around half of New Zealand's emissions – and are rising.

There are challenges here – and opportunities. The government proposes to work in partnership with the agricultural and forestry sectors, Māori and local government to find a way forward, but in the meantime has put in place the *Permanent Forest Sink Initiative*, the *East Coast Forestry Project* and is establishing a \$50 million *Afforestation Grant Scheme*.

# New Zealand's climate change solutions

Figure 4 | New Zealand low-carbon energy scenario – transport greenhouse gas emissions

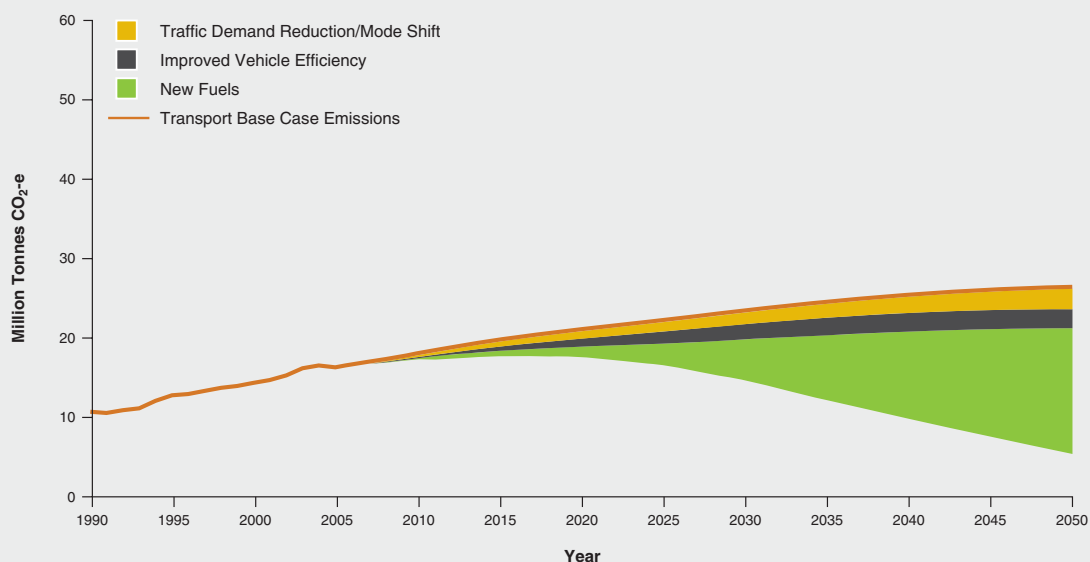


Figure 4 illustrates a low-carbon future scenario to 2050, showing possible technological and behavioural changes in travel demand, vehicle efficiency and uptake of alternative low-carbon fuels. The challenge is to ensure we make this move to this low-carbon scenario.

Emissions from transport are projected to increase by 35 per cent by 2030 if we do nothing. Switching fuel away from petroleum products to alternative forms of transport energy, such as biofuels and electricity, will be necessary to substantially reduce transport emissions in the future. Given our highly renewables-based electricity system, electric vehicles are a promising technology for widespread adoption in New Zealand, particularly for the light vehicle fleet.

For the heavy fleet, increasing the use of biodiesel is likely to be the main approach to emissions reductions.

Improved energy efficiency will also play an important role in reducing transport emissions. Improvements include increasing the fuel efficiency of the vehicle fleet, greater availability and use of public transport, and making our towns and cities more amenable to walking and cycling.

The level of travel is closely associated with urban form and land-use decisions. It will be important that decisions in these areas are aligned to progress towards a low-carbon transport sector.

New Zealand enjoys a long tradition of farmers adopting new technology and know-how. This is continuing – with joint research efforts between government and industry (such as the *Pastoral Greenhouse Gas Research Consortium*) combined with extra funding from government to facilitate the uptake of new environmentally friendly technologies.

The government is getting its own house in order by taking practical actions to mitigate its own greenhouse gas emissions and improving energy efficiency in government activities and buildings. Six departments are leading the way to a *Carbon Neutral Public Service*; the rest will follow.



Climate change solutions are as important for New Zealand businesses as they are for households. Not only do businesses need to adapt to different cost structures, but they can also take advantage of the strong “100% Pure” New Zealand brand.

The *Emprove* ([www.eecabusiness.govt.nz/emprove](http://www.eecabusiness.govt.nz/emprove)) programme provides support and assistance for industry groups implementing sustainable business practice. Grants are available through the *Energy Intensive Business* programme to help eligible businesses adopt energy-efficient technologies.

Govt<sup>3</sup> is a successful programme providing practical information, tools and case study material to government departments in order to improve their overall sustainability.

And where businesses are being managed in sustainable ways the government can ensure they get rewarded appropriately – through ‘eco-verification’ of products.

Much good work is already underway – both solutions to climate change and steps towards sustainability. But the challenge before us is great.

# New Zealand's climate change solutions

## Energy, transport and land management strategies

The government will maintain the momentum with the New Zealand Energy Strategy (NZES). The NZES sets out the government's vision of a reliable and resilient system delivering New Zealand sustainable, low-emissions energy services and describes the actions needed to make this vision a reality.

The NZES will be accompanied by the New Zealand Energy Efficiency and Conservation Strategy (NZECS), the government's action plan that supports the energy efficiency, energy conservation and renewable energy objectives set out in the NZES.

The NZECS sets out a series of targets, and means to achieve those targets, for improving energy efficiency and greater use of renewable energy.

This is supported by implementing the New Zealand Transport Strategy, which defines the government's vision of an affordable, integrated and sustainable transport system by 2010.

In the agriculture and forestry sectors, the government will be working in partnership with stakeholders and Māori to put in place a Plan of Action for Sustainable Land Management and Climate Change.

This package includes helping farmers, growers, foresters, and other businesses in the land management sectors develop the skills, knowledge, technology, and management techniques to reduce their emissions and adapt to climate change.

## The New Zealand Emissions Trading Scheme

The government is also engaging with all sectors of the economy on an *Emissions Trading Scheme*. Very simply, the scheme will support the government's existing sustainability and climate change initiatives by making it more expensive to behave in ways that increase emissions, and making it relatively cheaper to behave in ways that don't.

In December 2006, the government consulted broadly on possible policy directions on climate change through the release of five discussion documents. These documents identified a wide range of potential policy options to achieve an overall climate change objective of meeting our international obligations.

The options included emissions trading, a narrowly-based carbon charge, incentives, subsidies, direct regulatory measures, and voluntary approaches. The feedback showed broad – although not universal – support for the use of emissions trading as a preferred approach for reducing emissions in the long term.





In response to this consultation, the government has decided in principle that New Zealand will adopt an emissions trading scheme, rather than an emissions tax, as its core price-based measure for mitigating climate change, alongside other policies and measures to reduce overall domestic emissions.

Internationally, introducing an emissions trading scheme is seen as an equitable, effective and efficient way to reduce greenhouse gas emissions. Under such an emissions trading scheme, prices are established for units that allow the holders to emit greenhouse gases. Those prices then influence the decisions of producers, consumers and investors throughout the economy, driving emissions reduction and the expansion of more environmentally friendly alternatives.

The introduction of an effective emissions trading system can be seen as a core building block for the transformation of our economy. We have not had to consider until now how the gases emitted in the course of daily living have an impact on what our world might become. We now have to do that.

The publication *The Framework for a New Zealand Emissions Trading Scheme* outlines how the various parts of the New Zealand economy will be brought into the scheme in a staged transition, with the aim that by the start of 2013 all major sectors covered by the Kyoto Protocol will be included.

Emissions trading will mean an increase in the costs of products such as petrol and electricity. The scheme will be introduced gradually, allowing for smooth adjustments across the economy, and transitional assistance will be provided to both households and industry.

In transport, the government is taking a number of steps to improve efficiency and increase the use of public transport to reduce consumers' overall fuel use and costs. The government will put in place additional measures to reduce the financial impact on households of higher electricity prices, so that low and modest income households are not disadvantaged.

The Emissions Trading Scheme will be designed so that it can be adapted to future changes to New Zealand's obligations under the international climate change policy framework after 2012, and can endure if there is a gap between the end of the first commitment period of the Kyoto Protocol and the implementation of a successor agreement.

New legislation is required to introduce an emissions trading scheme, and the government will engage actively with stakeholders, Māori and the general public on its details. The legislation to enact the scheme will be introduced and passed during the current Parliament, and its consideration will involve a full select committee hearing process and public submissions.

#### **No one answer**

The above is not a comprehensive list. A detailed stock-take of these and other initiatives, including waste initiatives, can be found in the final section *Find out more*.

There is no one answer to climate change. The government's response must (and does) use many tools, including regulation, education, incentives and disincentives. It must cover all significant sectors of the economy, including energy, transport, agriculture, forestry, households and buildings.

# Adapting to climate change

As a small nation, with a biologically based economy that relies on a relatively benign climate, we are vulnerable to the environmental and economic impacts of climate change.

As well as reducing greenhouse gases, we also need to adapt to the adverse effects of climate change. The world is already experiencing changes in mean temperature, shifts in the seasons, and an increasing frequency of extreme weather events. These are set to continue. Adaptation is essential to minimise the risks of climate change and maximise the opportunities.

In its chapter on the New Zealand and Australia region, the IPCC *Fourth Assessment Report on Climate Change Impacts, Adaptation and Vulnerability* confirmed that the effects of climate change are already being felt in New Zealand. Since 1950 there has been a 0.3–0.7°C warming across the region as a whole, with more heat waves, fewer frosts, more rain in southwest New Zealand, less rain in north-eastern New Zealand, a rise in sea level of about 70 mm, reduced seasonal snow cover, and ongoing glacial shrinkage.

The IPCC report suggests that the most vulnerable sectors for New Zealand are natural ecosystems, water security, and coastal communities.

The following climate change effects are predicted for New Zealand during the 21st century:

- > higher temperatures – more in the North Island than the South, but probably still less than the global average
- > rising sea levels – global sea levels are expected to rise between 18 and 59 cm by 2100, compared with an average rise of 10 to 20 cm in the 20th century
- > more frequent and intense extreme weather events such as droughts (especially in the eastern parts of New Zealand), landslides, storm surges and floods
- > a change in rainfall patterns – higher rainfall in the west and less in the east
- > less frequent frosts, and rising snowlines.





These changes may have both positive and negative impacts. For example:

- > people are likely to enjoy the benefits of warmer winters with fewer frosts, but hotter summers will bring increased risks of heat stress and subtropical diseases
- > rising sea levels will increase the risk of erosion and saltwater intrusion, increasing the need for coastal protection
- > major infrastructure and people's homes will be at risk from more frequent and intense extreme weather events
- > agricultural productivity is expected to increase in some areas, but there is the risk of drought and spreading pests and diseases
- > retreating snowlines and glaciers are expected to change water flows in major South Island rivers, and may also affect the skiing industry
- > New Zealand's native flora and fauna may come under threat due to habitat loss, both on land and in our waterways and oceans.

Our coastal areas, roads, cities, towns, waterways and farms are all likely to be affected by the impacts of climate change. We need to take action so that we can be more resilient to our current climate, less susceptible to the future climate and in a position to take advantage of opportunities.

If we start preparing and adapting now, we will reduce the associated risks brought about by a changing climate, and our communities will have greater resilience to climate impacts and extremes. Forward planning is more effective and less costly than reacting to crises when they occur. It is like taking out an insurance policy for our future.

To help New Zealand build its resilience and plan ahead, the government has formed partnerships with local government, engineers, the insurance industry, and the agriculture sector.

The immediate priority areas for action include water and coastal issues, biodiversity, maintaining public infrastructure (such as transport, telecommunications and energy supply), and primary production (ie, agriculture, including fostering appropriate land-use development and planning). The government also supports and encourages industries and communities in vulnerable sectors and regions to engage in early planning.

# New Zealand has sustainability – our path to carbon neutrality

Without a commitment to greater sustainability in our resource use and way of life, we risk not only damaging our own environment, but also exposing our economy to significant risk.

The government believes New Zealand can become the world's first truly sustainable nation.

A truly sustainable New Zealand is a New Zealand that looks after its environment as well as its economy, the social well-being of its people and its culture, and its national identity. It will involve a transformed economy where people are prosperous, but not at the expense of the planet.

This publication has outlined that the government has an active and comprehensive plan in place for tackling climate change – a plan that involves individuals, households, businesses and the community all playing their part.





To guide our progress the government has adopted the following targets for New Zealand:

- > **by 2025, 90 per cent of our electricity generation will be from renewable sources**
- > **by 2040, our per capita transport greenhouse gas emissions will be reduced by half of those in 2007**
- > **we will be one of the first countries in the world to widely deploy electric vehicles**
- > **we will remain a world leader in agricultural emissions reduction research, and in the early adoption and application of new technologies and processes that reduce agricultural greenhouse gas emissions**
- > **by 2020, we will achieve a net increase in forest area of 250,000 hectares of that in 2007.**

These targets signal the direction of travel. They are challenging but achievable. The government's current policy settings are moving us in the right direction. Ongoing initiatives will be necessary to ensure momentum is maintained.

Together, through business and community efforts alongside the government's active programme, we must leverage our expertise to shift New Zealand to achieving these targets.

The government has signalled its aspiration for New Zealand to be carbon neutral over time. Achieving the sector targets set out here will move New Zealand strongly in this direction. In particular, it will allow us to be effectively:

- > carbon neutral in the electricity sector by 2025
- > carbon neutral in the stationary energy sector by 2030
- > carbon neutral in the transport sector by 2040
- > carbon neutral in the total energy sector by 2040.

**'Why shouldn't New Zealand aim to be the first country which is truly sustainable – not by sacrificing our living standards, but by being smart and determined?'**

**I want New Zealand to be in the vanguard of making it happen – for our own sakes, and for the sake of our planet.**

**I want sustainability to be central to New Zealand's unique national identity.'**

**Rt Hon Helen Clark**  
Prime Minister

## Find out more

> Check out the following list of government initiatives with climate change benefits:

### Energy



Current government energy initiatives include the following:

- > **The New Zealand Energy Strategy (NZES)** aims to deliver a reliable and resilient system delivering New Zealand sustainable, low emissions energy services. Its priorities are maximising the contribution of cost-effective renewable energy resources while safeguarding our environment, maximising the contribution of cost-effective energy efficiency and conservation of energy, and reducing greenhouse gas emissions. The NZES covers electricity and stationary energy, transport, and sustainable energy technologies. It also looks at the role of the Resource Management Act in consenting renewable energy projects.
- > **The New Zealand Energy Efficiency and Conservation Strategy (NZECS)** is the government's action plan that supports the energy efficiency, energy conservation and renewable energy objectives set out in the NZES.
- > **The Marine Energy Fund** has been established under the NZES and provides a contestable \$8 million fund over four years to support the early deployment of marine-based electricity generation, such as wave or tidal.
- > **New energy investment** from 2006 (\$11.7m over 4 years) is targeted towards bio-energy options, the New Zealand 'Energyscape', and a hydrogen economy.
- > **The Forest Industries Development Agenda** is a bio-energy programme targeting demonstration projects for bio-energy such as using wood waste as a substitute for coal and gas (\$2.5m over 4 years).
- > **Mandatory Minimum Energy Performance Standards** have been implemented by the government for many products, including fridges/freezers, hot-water cylinders and air conditioners. These standards, matched with information and product labelling initiatives, help to ensure that we all buy more efficient appliances and equipment.
- > **Government investment in energy research** includes geothermal energy, biofuels, generating electricity from waves, and improving household efficiency. Statistics New Zealand estimates the private sector investment in energy research was approximately \$15.8m in 2004.
- > A **national policy statement** under the Resource Management Act on renewable electricity generation is currently under consideration.
- > **Regulations for the connection of distributed generation** have been implemented.

## Transport



Some current government transport initiatives include:

- > The **New Zealand Transport Strategy** defines the government's vision of an affordable, integrated, safe, responsive and sustainable transport system by 2010. One of its aims is to ensure environmental sustainability, and policies will encourage energy-efficient modes of transport.
- > There will be **\$900 million** additional investment in public transport in the period 2006 to 2010, in particular on rail infrastructure improvements in Auckland and Wellington, as well as national rail improvements.
- > **Transport research** has received some limited investment (currently \$0.5m per year) and a limited element of the Land Transport New Zealand's annual research investment of \$4m is targeted at sustainable land transport and understanding the effects of climate change.
- > A **biofuels sales obligation** requires 3.4 per cent of liquid fuel sales to be biofuel by 2012.
- > The government's **FuelSaver website** provides consumers with information to compare the fuel consumption of different vehicle models. The website also enables drivers to calculate vehicle fuel costs based on their vehicle model, the distance travelled, the kind of fuel used, and their driving habits. See: [www.fuelsaver.govt.nz](http://www.fuelsaver.govt.nz)
- > The **Choke the Smoke campaign** encouraged people to go on a "low-carbon diet", for example, by using public transport, car pooling, walking or cycling, tuning their cars, keeping tyres inflated correctly, and using their accelerator more sparingly. See [www.chokethesmoke.govt.nz](http://www.chokethesmoke.govt.nz)
- > **Mandatory vehicle fuel-efficiency labelling** requires fuel consumption labelling at the point of sale for light vehicles. The scheme covers both new and used vehicle sales.
- > **Travel behaviour programmes** offer guidelines for developing walking school buses and workplace travel plans. For more information see: [www.landtransport.govt.nz/sustainable-transport/](http://www.landtransport.govt.nz/sustainable-transport/)
- > The **Walking School Bus programme** helps reduce emissions by promoting a fun, safe and energy-efficient way for children to walk to school, thereby reducing the number of short car trips. It works with two parents picking up each child from their home on a set route and walking in a line to school (one parent leading and another bringing up the rear). Twenty-two thousand children participated in the first "Walk to School Week" campaign of 6–10 March 2006.

There are also a number of proposed transport policies and measures, including:

- > A **vehicle fleet sales-weighted standard for fuel economy** will require a certain average fuel economy for all light vehicles entering the New Zealand fleet during a particular period. The standard will be designed to encourage improved fuel consumption across all vehicles entering the fleet, while providing flexibility to the industry and choices to consumers.
- > The **fleet operators' commitment programme** will provide information and training to drivers of heavy and light vehicles, because differences in driver behaviour alone can affect fuel use by up to 35 per cent. A training programme for heavy-vehicle drivers could give estimated energy savings of at least 10 per cent.
- > A **proposed vehicle exhaust emissions rule** in 2008 to promote the introduction of newer vehicle technology by imposing tighter emission standards for new and used vehicles entering the fleet.
- > Setting up a **vehicles energy and renewables group** to focus on future opportunities for electric vehicles and biofuels.

## Find out more

> Check out the following list of government initiatives with climate change benefits:

### Industry



The following are some of the current government industry-related initiatives.

- > The **Business Partnerships for Sustainability** programme will make it easier for New Zealand businesses to find out about and implement sustainable business practices. It will include support for existing sustainability advisory services and the expansion of assistance to industry groups.
- > Opportunities for further investment to better address research needs have been identified for **low-carbon energy technologies** with financial assistance of \$12.5 million over four years.
- > The government is working in partnership with businesses to help improve the energy efficiency of operations through the **Emprove programme** ([www.eecabusiness.govt.nz/emprove/](http://www.eecabusiness.govt.nz/emprove/)). Participants in this project are given access to energy management information and tools, financial assistance for energy surveys and audits, training support at energy seminars and courses, on-site solutions, and technical and management information.
- > For businesses that spend a high portion of their costs on energy, the New Zealand government also runs the **Energy Intensive Business programme** ([www.eecabusiness.govt.nz/eib/](http://www.eecabusiness.govt.nz/eib/)). This project provides cash grants for eligible businesses to adopt energy-efficient technologies – inspiring others in their industry to get smart about energy use. The project also helps to accumulate a data set of the cost effectiveness of various approaches to improving energy efficiency.
- > The government has two **Negotiated Greenhouse Agreements** with New Zealand Refining Co and Oceana Gold Ltd. Under these agreements, these firms have established emission intensity pathways toward world's best practice performance for emissions from energy use and industrial processes.
- > Recognising the small contribution sulphur hexafluoride makes to New Zealand's overall greenhouse gas emissions profile, the government has agreed to a memorandum of understanding with relevant industry participants to manage sulphur hexafluoride emissions.

## Sustainable land management (agriculture and forestry)



In addition to the New Zealand Emissions Trading Scheme, the **Sustainable Land Management and Climate Change Plan of Action** provides a platform for the government to work in partnership with the agricultural, horticultural and forestry sectors, Māori and local government on climate change issues.

This is critical to secure the changes in land-use practices needed for New Zealand to successfully adapt to changes in climate, reduce agricultural emissions and secure new forest planting.

In partnership with the sectors, the **Plan of Action** will deliver:

- > A five-year **adaptation programme** that will help the land management sector build the capability to address the risk and opportunities from climate change. As part of this programme a **\$5.7 million community irrigation fund** will be established to help rural communities adapt to increasing drought risk.
- > A range of complementary measures to the Emissions Trading Scheme including the establishment of farm-scale greenhouse gas monitoring and reporting, and a \$50 million **Afforestation Grant Scheme** which allows landowners who elect not to enter the Emissions Trading Scheme to realise the climate change mitigation benefits of afforestation.
- > A five-year work programme aimed at addressing barriers which hinder the private sector from **capitalising on climate change opportunities**. This includes the development of a **greenhouse gas footprint response** for the primary sectors and reviewing market opportunities such as the creation of markets for emission-reducing technologies. In addition, \$10 million will be invested in research, development and commercialisation of **biofuel, biochar and energy-efficiency** opportunities.
- > A **strategic framework for research** to provide a comprehensive research and technology platform to underpin the Plan of Action and to coordinate the investment of \$10 million per annum by 2010 in new research funding into adaptation and mitigation of agriculture and forestry greenhouse gas emissions.

### Pastoral Greenhouse Gas Research Consortium (PGGRC)

Much of the research effort to reduce agricultural greenhouse gas emissions has been coordinated through the PGGRC, a joint government and industry-funded research consortium which implemented a five-year research strategy in 2003.

New funding has recently been agreed, and the PGGRC will continue to be a critical vehicle for undertaking research into reducing greenhouse gas emissions in the agricultural sector.

- > A **Technology Transfer programme** to enhance the ability of the sector to quickly roll out and adopt new technology.
- > A **communications programme** to facilitate delivery of factual information and key messages to the sectors and ensure sustained action over the medium to long term.

The government already has in place a range of initiatives that will help the land management sectors address climate change including:

- > the **Permanent Forest Sink Initiative**, a scheme that targets owners of land that will be kept under forest cover indefinitely, rather than clear-felled at the end of each rotation (see [www.maf.govt.nz/forestry/pfsi](http://www.maf.govt.nz/forestry/pfsi))
- > the **East Coast Forestry Project** – under the existing project, landholders in the region are provided with a cash grant for soil conservation purposes (see [www.maf.govt.nz/forestry/east-coast-forestry](http://www.maf.govt.nz/forestry/east-coast-forestry))
- > Other government programmes such as the **On-farm Adverse Events Policy** (see [www.maf.govt.nz/mafnet/rural-nz/assistance/adverse-events/index.htm](http://www.maf.govt.nz/mafnet/rural-nz/assistance/adverse-events/index.htm)) and **Sustainable Land Management (Hill Country Erosion)** (see [www.maf.govt.nz/mafnet/rural-nz/slm-hill-country-erosion-programme/index.htm](http://www.maf.govt.nz/mafnet/rural-nz/slm-hill-country-erosion-programme/index.htm)).

## Find out more

> Check out the following list of government initiatives with climate change benefits:

### Waste



The government is considering and/or implementing a broad range of waste policies, particularly those driven by targets in the **New Zealand Waste Strategy**.

These include the following:

- > **National Environmental Standard for Landfill Gas** – requires landfill sites with a design capacity greater than 1 million tonnes of refuse to collect and destroy methane emissions. The regulation sets standards for the flaring of the gas, but also allows for destruction of collected gas via beneficial uses of methane such as electricity generation.
- > **Reduce Your Rubbish Campaign** – is centred on the website [www.reducerubbish.govt.nz](http://www.reducerubbish.govt.nz). The website provides practical information on how to reduce waste, including advice on how to compost organic materials, recycling, shopping environmentally, and making a difference at work.
- > **Packaging Accord** – is a voluntary industry and government initiative to make more sustainable use of packaging. Under the Accord, producers (brand owners and retailers/importers) will take responsibility for what happens to their packaging products throughout their lifecycle, from manufacture to use, to recycling and eventual disposal. The goal is for everyone to waste less and be more efficient when making, using and recovering packaging materials.
- > The **Waste Minimisation (Solids) Bill** – proposes provisions to raise revenue for solid waste reduction and infrastructure programmes. A possible source of this revenue is a national waste levy.
- > **Simply Sustainable** – an eco-efficiency tool-kit for businesses that helps reduce their emissions by promoting energy efficiency and best practice in waste management.

## Households



There are many things we as New Zealanders can do to reduce our household emissions and many of them are remarkably easy to do. Current government initiatives for households include the following.

### The Household Sustainability Campaign

The Household Sustainability Campaign focuses on practical ways in which New Zealanders can improve energy efficiency and reduce waste in their homes. This programme will have co-benefits for reducing the impacts of climate change. See the website at [www.sustainability.govt.nz](http://www.sustainability.govt.nz)

### The EnergyWise Homes Package

This provides a “one-stop-shop” of information and support to improve the energy efficiency and heating of New Zealand homes. The website is at [www.energywise.org.nz/](http://www.energywise.org.nz/). The package is designed to meet the needs of people in all income groups, and across a range of heating and energy efficiency needs. The package includes:

- > activities to improve **public awareness** and information about energy efficiency, the benefits of energy efficiency (for people’s health, wealth and the environment), and existing government initiatives to promote energy efficiency
- > **research** to assess, and help householders compare, the energy efficiency of different household products (eg, hot-water systems, lighting products, space heaters, small-scale energy systems)
- > a proposed **interest-free loan** scheme to help homeowners install or upgrade energy-efficient products (such as insulation, efficient lighting, or hot-water heating systems) and clean heaters in their homes

- > funding to maintain the number of energy-efficiency retrofits through EECA’s **EnergyWise Home Grants scheme** (targeted at low-income householders) at 12,000 homes per annum
- > grants for about 800 new **clean heating (Warm Homes) retrofits** per annum for low-income households, targeted at areas of low air quality
- > developing a **Home Energy Rating Scheme** for New Zealand, which may require a homeowner to obtain an accredited assessment of their home’s energy efficiency, at the time of sale, with the aim of creating a financial incentive for homeowners to invest in energy efficiency, and a market-based incentive for financial institutions to support such investment. It is intended for the scheme to be launched on a voluntary basis at first, although the government may decide to make it mandatory at some time in the future
- > work by central government agencies to **support councils** to implement new energy efficiency-focused legislation, such as recent changes to the Building Code, and to help councils promote energy efficiency within their communities
- > funding for central government agencies to work with private companies and institutions to develop **new financial incentives** (such as green mortgages or direct subsidies) for householders to invest in energy-efficient technologies.

### Smarter Homes

The Smarter Homes website ([www.smarterhomes.org.nz](http://www.smarterhomes.org.nz)) offers advice on how to have a home that is more environmentally and financially sustainable. It has information on energy, design, landscaping, materials, construction and water.

## Find out more

> Check out the following list of government initiatives with climate change benefits:

### Households (continued)



#### Building Code review

The Building Code review takes into account the new purpose and principles of the Building Act 2004, which includes requirements for sustainable development. The changes to the Code encourage the reduction of emissions by ensuring our buildings are designed, constructed and used in ways that promote energy conservation and efficiency in areas such as water heating, heating, cooling, ventilation and lighting.

#### Solar Water Heating Programme

This programme will reduce greenhouse gas emissions by promoting the uptake of solar water heating, which in turn reduces the demand for electricity and gas. The programme includes:

- > an information website for consumers about solar water heating systems
- > a quality standard and energy performance modelling for solar water heating systems
- > financial assistance to new home builders and existing homeowners
- > a commitment to putting more solar water heaters into government buildings
- > a contestable innovation fund for new projects, which will lead to a significant increase in the use of solar water heating.

For more information about the programme, see: [www.solarsmarter.org.nz/](http://www.solarsmarter.org.nz/)

#### Energy Star

Energy Star is a global mark showing products with outstanding energy efficiency. The energy star label was introduced to New Zealand in July 2005. The label makes it easy for consumers to compare the energy consumption of different models of appliances.

#### Residential lighting efficiency programme

A campaign by the Electricity Commission to market (including with subsidies) compact, fluorescent (energy-efficient) light bulbs to householders.

#### New Zealand Housing Strategy

The New Zealand Housing Strategy will help reduce emissions by promoting energy-efficient houses that are healthier to live in. In addition to the health benefits, energy-efficient homes have a reduced environmental impact and lower heating costs.

#### Urban Design Protocol

The Urban Design Protocol provides a platform to make New Zealand towns and cities more successful through quality urban design. The Protocol seeks to ensure the design of our cities minimises waste production, and energy and water use, and maximises the efficiency of land use and infrastructure.

The roll-out of the New Zealand Energy Efficiency and Conservation Strategy provides an opportunity to accelerate the delivery of these – and additional – measures in partnership with local government, the private sector and community groups.

## Public sector



The government is leading the way by taking practical actions to mitigate its own greenhouse gas emissions and improve energy efficiency in government activities and buildings. The government is using its \$25 billion per year spending power to help drive innovation, cleaner production, and improved cost-effectiveness over the whole lifecycle of goods and services as follows.

### Sustainable government procurement project

The purpose of the sustainable government procurement project is to make sustainability a core component of government procurement policy and practice. Through sustainable procurement practice, government departments will be encouraged to purchase goods and services which are more water and energy-efficient, emit less carbon, produce less waste, and are accredited or environmentally certified where possible.

### Carbon neutral public service

This programme aims to offset the greenhouse gas emissions from an initial group of six agencies by 2012. The six lead-in agencies are currently in the process of preparing emissions inventory reports. These reports will be independently verified by December 2007 this year. Unavoidable emissions will be offset, primarily through indigenous forest regeneration projects on conservation land. All 34 public service agencies will have emissions reduction plans in place by December 2007.

### Govt<sup>3</sup>

The Govt<sup>3</sup> programme assists central government agencies to undertake sustainable and energy-efficient activities. Approximately 50 agencies have formally signed up to Govt<sup>3</sup> membership. The Govt<sup>3</sup> programme also engages in less formal partnerships with sustainability leaders in the wider public and private sectors. The programme provides information, practical tools, and links to other agencies that have undertaken similar initiatives. Govt<sup>3</sup> focuses on four key topic areas: recycling/waste minimisation, buildings, transport, and office consumables and equipment.

The Govt<sup>3</sup> programme will expand in the future to encourage Crown entities, schools and district health boards to participate in emissions reduction measures on a voluntary basis.

### Communities for Climate Protection

This is a voluntary programme for local councils. It provides a framework for local councils to measure and reduce greenhouse gas emissions from their own operations and from their communities by:

- > improving energy efficiency and conservation
- > increasing sustainable transport
- > enhancing urban design
- > reducing landfill emissions at the municipal level.

The framework sets five milestones for councils:

- > conduct a greenhouse gas emissions inventory
- > analyse and forecast set emission reduction goals
- > develop a local action plan to achieve these goals
- > implement and quantify the benefits of policies and measures in the action plan
- > monitor progress towards the reduction goal.

### Climate change adaptation work programme

The government's climate change adaptation work programme has developed a range of information and guidance materials on the impacts of climate change and how we can adapt to and prepare for these impacts.

The government will be enhancing adaptation efforts by ensuring better coordination between central government agencies, through the maintenance of partnerships with local government on the need to prepare for climate change.

The Quality Planning website at [www.qualityplanning.org.nz/plan-topics/climate-change.php](http://www.qualityplanning.org.nz/plan-topics/climate-change.php) provides information on expected climate change impacts in New Zealand and advice on methods for considering and addressing climate change effects under the Resource Management Act.

## Find out more

> Check out the following list of government initiatives with climate change benefits:



### Other initiatives



#### Public awareness

The government has launched public awareness campaigns to raise public awareness about climate change and to inspire individuals to take action. For example, the **Ecwise Travel Guide** is a leaflet for tourists explaining how to reduce their greenhouse gas emissions and environmental impact when travelling in New Zealand. The leaflet is available on the New Zealand Tourism website at [www.tourism.net.nz/community/](http://www.tourism.net.nz/community/)

Other public awareness campaigns focus on households or on particular sectors of the economy, for example, the Energywise project [www.energywise.org.nz](http://www.energywise.org.nz) and the Choke the Smoke Campaign [www.chokethesmoke.govt.nz](http://www.chokethesmoke.govt.nz)

#### Existing Projects to Reduce Emissions (PRE)

The Projects to Reduce Emissions (PRE) programme supports initiatives which achieve reductions in greenhouse gas emissions that would otherwise not occur.

The programme awards participants tradable Kyoto Protocol emissions units for reducing greenhouse gas emissions during the Kyoto Protocol's first commitment period (2008–2012).

The projects must achieve reductions that are additional to business-as-usual, which means the programme helps bring forward projects that would not otherwise be economic. Projects must also take place in New Zealand and result in a reduction in the total greenhouse gas emissions that New Zealand reports in the greenhouse gas inventory.

There have been two contestable tender rounds for the PRE programme, the first in 2003 and the second in 2004. At this stage there will not be a third tender round.

#### Enhanced eco-verification

"Eco-verification" involves setting standards for the environmental impacts of products and processes, determining how to measure compliance with these standards, and then verifying and certifying that the standards have been met.

The enhanced eco-verification initiative aims to:

- > improve information about standards and certifications relating to the reduced environmental impacts of products and firms
- > facilitate tools to help businesses meet those standards
- > enhance systems to verify that the standards have been met.

As part of the initiative, the government will expand the Environmental Choice NZ eco-label to a wider range of products, and will also establish an online database of reliable eco-labels and standards verification schemes which are used in New Zealand.

#### Research

The government has increased funding for climate change research, as previously mentioned in this publication. The annual investment round by the Foundation for Research Science and Technology includes \$150 million to investigate how to promote sustainability and respond to climate change.

One new initiative includes research into **wild animal control for emissions reduction** (\$1m) to see if by removing wild animals from regenerating vegetation we can increase its carbon sink capacity.



