


New Zealand **Energy Strategy 2011–2021**

Developing our energy potential

and the **New Zealand Energy Efficiency and Conservation Strategy 2011–2016**




Contents

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Foreword

The overarching goal of the Government is to grow the New Zealand economy to deliver greater prosperity, security and opportunities for all New Zealanders.

Globally, there are two energy challenges: energy security and responding to climate change. Responding to these challenges is a major undertaking. Renewable sources of energy will help us meet these challenges, but we need to be realistic and acknowledge that there is no single answer. For the foreseeable future, fossil fuels will continue to be an important part of the global energy mix.

Developing our diverse resources in a responsible manner will enable New Zealand to deal with these energy challenges while minimising the costs to our households and businesses and ensuring we remain in step with the international community. We need to ensure we create the right incentives for development, including managing environmental effects responsibly.

We are fortunate to be blessed with abundant energy resources – renewables, petroleum and minerals. We are a world leader in geothermal energy. Our rivers and lakes have long provided clean hydroelectricity. Our wind resources are world class. New Zealanders are exploring how to harness the waves, the tides, and the sun in order to generate power. New Zealand also has an abundance of petroleum and mineral resources. Developing these resources can contribute to energy security and provide export earnings for New Zealand.

Recently, the International Energy Agency commended our efforts to develop all our energy resources. Our strong and robust environmental regulations, including our Emissions Trading Scheme, ensure the environmental impacts of energy supply are managed.

Petroleum plays a vital role in transport and many other sectors. Around half of the energy we currently consume is from petroleum. We cannot just turn off the tap in our journey to a lower carbon economy. As fuel costs continue to rise, a key challenge will be to reduce our reliance on petroleum while enabling New Zealanders to have access to competitively-priced energy. A diverse development approach can ensure we achieve our overarching goal.

The New Zealand Energy Strategy sets the strategic direction for the energy sector and the role energy will play in the New Zealand economy. It is in New Zealand's interest to use its portfolio of energy resources to maximise economic opportunities in a way that is environmentally-responsible.

The strategy focuses on four priorities to achieve that: diverse resource development; environmental responsibility; achieving efficient use of energy; and promoting energy security and affordability. None of these priorities is more important than the other.

Finally, I am pleased to present the New Zealand Energy Strategy together with the New Zealand Energy Efficiency and Conservation Strategy. Energy efficiency and conservation have an important role to play in economic growth and meeting our energy challenges. All New Zealanders benefit from more effective use of our resources. The Energy Efficiency and Conservation Strategy promotes practical actions that encourage consumers of energy to make wise decisions and choose efficient products.

I am confident these strategies provide the Government's vision for New Zealand's energy sector – one that is efficient and contributes to the economic prosperity of all New Zealanders.

Hon. Hekia Parata
Acting Minister of Energy and Resources

Developing our diversity – New Zealand's energy future

The Government's overarching goal is to grow the New Zealand economy to deliver greater prosperity, security and opportunities for all New Zealanders.

Energy is an essential input to all sectors. Our abundant and diverse energy resources have long underpinned our economy.

All nations face challenges to how they use energy now and in the future. Internationally, countries are striving to improve energy security, reduce pressure on the environment and reduce greenhouse gas emissions.

In the future, we expect:

- The cost of greenhouse gas emissions will be increasingly factored into world markets.
- Technological advances will occur in energy production, electricity systems, and energy management in buildings, industry and transport.
- The price of oil will rise and become more volatile.
- Non-renewable energy sources will continue to be an important part of the global energy mix for the foreseeable future.
- Renewable energy sources will be an increasingly important part of the global energy mix.

While New Zealand must, like all countries, adapt to a changing energy future, we have competitive advantages. We pride ourselves on being nimble and quick to adopt new technologies, and to develop new technologies. We have a diverse portfolio of renewable and non-renewable resources and future options which are amongst the best in the world.

Our challenge and opportunity is to use these resources for the benefit of all New Zealanders.

We have extensive renewable opportunities

Our geography and climate provides us with mountains from which large rivers flow, enabling hydro power. We have access to geothermal energy. Our wind resources are equal to the best the world can offer.

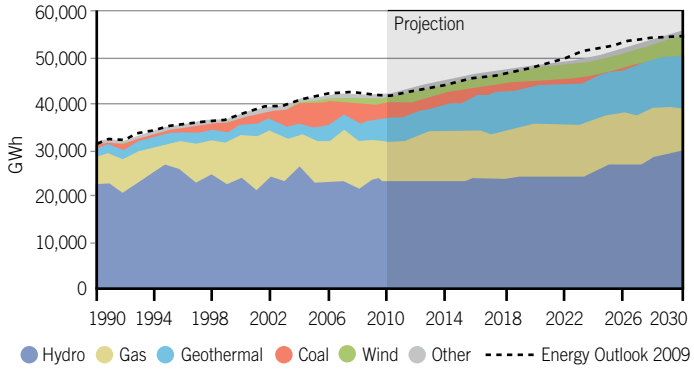
We have untapped solar energy and could potentially harness the power of the oceans that surround us. Extensive farming and forestry options mean biomass could be a source of electricity, heat or biofuels.

Unlike most other countries that are trying to build up their renewable portfolio, we have hit the ground running. New Zealand has a proud history of developing its renewable energy potential. Our hydro and geothermal developments are amongst the country's greatest engineering achievements. We are rapidly developing expertise and a track record in wind energy. The country has real opportunities in newer, emerging technologies, such as marine, solar and biofuels.

Renewables already play a significant role in our energy mix. In 2005, geothermal and wind generated 9 percent of our electricity. In 2010, the proportion generated from these sources increased to 17 percent and overall 74 percent of our electricity was generated from renewable sources.

Our projections suggest that, over the next decade, renewables will continue to be a major source of new electricity generation.

Electricity generation by fuel[1]

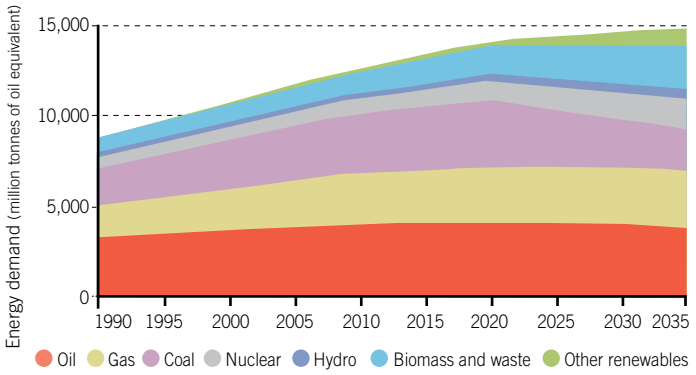


Capturing the upside of existing and emerging renewable technologies is a source of competitive advantage to New Zealand. It will provide us access to environmentally friendly energy in a future where the world will face increasing environmental constraints. Renewable energy is therefore a key area of focus for the Energy Strategy.

Non-renewables are an important part of the mix

There is no single answer to New Zealand's, and the world's, energy challenges. Renewable energy has an increasingly important role to play, but we cannot shift from using non-renewables overnight. We need to ensure secure and affordable energy for our households and businesses and to achieve that we need to be realistic. For the next few decades at least, the world and New Zealand will need oil, gas and coal.

Global energy demand: International Energy Agency 450 scenario[2]



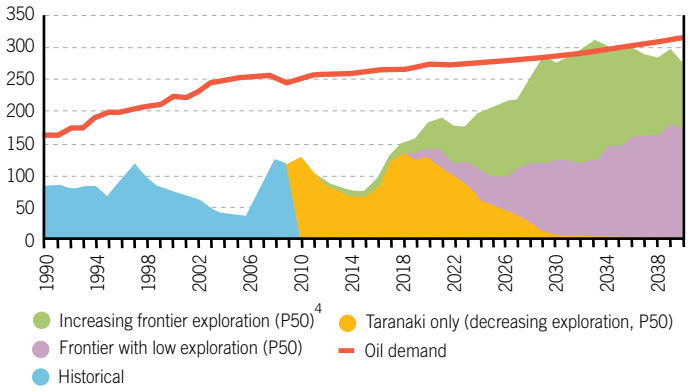
1 *New Zealand's Energy Outlook 2010 Reference Scenario and Sensitivity Analysis.* Ministry of Economic Development; 2010; p 6.

2 The International Energy Agency's 450 scenario sets out an energy pathway consistent with limiting the global temperature increase to two degrees Celsius if the concentration of greenhouse gases in the atmosphere is limited to around 450 parts per million of CO_2-equivalent. The scenario assumes implementation of the high-end of national pledges and stronger policies after 2020, including the near-universal removal of fossil-fuel consumption subsidies. Source: *World Energy Outlook 2010.* International Energy Agency; 2010; pp 62, 618 & 619.

Our geological history has provided us with rich mineral and petroleum resources, of which only a small proportion have been tapped to date. Developing New Zealand's potential non-renewable resources is an opportunity that we, as a country, should grasp, provided that the very highest standards of environmental protection are applied.

New Zealand's oil and gas production could be substantially increased – potentially to the point where New Zealand becomes a net exporter of oil by 2030[3].

Oil production and demand (petajoules)



Our global role

New Zealand's diverse energy portfolio has the potential to help the world meet its energy challenges. Through developing our petroleum resources we contribute to global energy security – and have been commended for doing so by the International Energy Agency. There are also opportunities to displace carbon intensive energy sources by developing our potential gas reserves.

In addition, we have the expertise and technologies both to assist other countries to develop their energy resources and generate income for New Zealand. Geothermal is an area where New Zealand is a leader. New Zealand firms are already involved in offshore geothermal developments.

Delivering energy to the customer

As purchasers of energy, affordability is often uppermost in people's minds. While New Zealanders have been very conscious of changes in electricity and petrol prices, internationally we stack up well, enjoying lower prices of energy than many other countries.

We keep energy as affordable as possible by ensuring our energy markets are competitive. We are committed to a price on carbon, and we look to minimise market distortions caused by subsidising particular energy sources.

Customers also play a role. It's easier than ever to switch between electricity retailers. While we have little influence over internationally traded oil prices, the Ministry of Economic Development publishes oil prices and industry costs to give customers confidence that the pump prices are fair.

Energy efficiency is part of the answer

Customers – be they households, business or industry – have a key role in energy efficiency. Using energy more efficiently can be an easy way for households and businesses to save money. Using energy more efficiently can also reduce greenhouse gas emissions and defer the need to develop new sources of energy.

But energy efficiency is not just about cost savings – energy efficiency measures can make a real difference to people's quality of life. Many New Zealand homes are cold and damp. Improving insulation in homes makes those homes warmer and more comfortable, resulting in health benefits. With these multiple benefits, investing in energy efficiency is a smart thing to do.

Government programmes like the Warm Up New Zealand: Heat Smart insulation and clean heating scheme and energy labelling for vehicles and appliances have helped raise awareness of the importance of energy efficiency. We have an opportunity to build on this momentum and to encourage further investment in energy efficiency technologies.

Our energy future

Global challenges of energy supply and climate change will increasingly influence the availability and cost of energy. New Zealand's future competitiveness will, in many sectors of the economy, require innovative solutions in the sources and uses of energy – both renewable and non-renewable.

Developing all energy resources, subject to environmental considerations being managed, is necessary for our economic future. Secure and affordable energy is needed to maintain our economic performance and our social well-being. Of the energy we do use, using it efficiently will reduce costs, enhance economic growth and reduce greenhouse gases.

While achieving these other priorities, New Zealand must continue to manage its environment responsibly. We already have a great reputation as a country that manages its environment and takes leadership on environmental issues, which the Government is determined not to squander.

We need a resilient energy system – the future holds many challenges. A diverse energy system is key.

3 Based on analysis by the Ministry of Economic Development on New Zealand's petroleum and mineral resources. See www.med.govt.nz/energyoutlook for more information.

4 Probable reserves have a 50 percent certainty of at least the specified volume being recovered, and are commonly referred to as P50.

Our goal

The Government's goal is for New Zealand to make the most of its abundant energy potential, for the benefit of all New Zealanders.

This will be achieved through the environmentally-responsible development and efficient use of the country's diverse energy resources, so that:

- The economy grows, powered by secure, competitively-priced energy and increasing energy exports.
- The environment is recognised for its importance to our New Zealand way of life.

The Government's strategic approach

The Government's approach to making the most of our energy potential is to ensure energy markets are effective and efficient. This approach will encourage efficient energy use, the development of resources where it is economic to do so, the minimisation of the environmental impacts of energy supply and use, and the meeting of our international responsibilities on addressing greenhouse gas emissions.

Making the most of our resources involves enabling investors to optimise the development of resources and ensuring resources are used efficiently to get the most value from them.

Iwi, hapu and all local and regional communities have an important role to play in making the most of our resources. The Government acknowledges that, in addition to further balancing the use of their own resources, Māori, as Treaty partners, wish to have their long-standing guardianship/kaitiakitanga over New Zealand's natural resources recognised through a greater role in regional and national management and decision-making processes. This is being given effect through Treaty settlements and other processes.

The Government is committed to well functioning markets, with the right regulatory frameworks in place. For example, the 2009 electricity market review adjusted incentives to improve security of supply and competition. The New Zealand Emissions Trading Scheme provides a price incentive for reducing carbon emissions. The electricity market governance changes and Resource Management Act reforms have adjusted the regulatory framework to facilitate appropriate investment.

The Government's role in both industry development and in energy efficiency is to provide incentives and information, and to help remove barriers to markets operating effectively. For example, the Petroleum Action Plan outlines a range of initiatives to attract significant investment into New Zealand and to develop resources in an environmentally-responsible way. Similarly, the popular Warm Up New Zealand: Heat Smart home insulation and clean heating programme has provided an incentive to homeowners to prioritise investments in upgrading the energy performance of their homes.

The economic prosperity of many sectors is affected by the availability and cost of energy, energy development and infrastructure, and their energy choices. While the Government sets the framework and incentives, the decisions and opportunities taken by landowners, investors, communities and individuals will have a big influence on the country's energy future.

Strategy structure

The strategy focuses on four priorities to support New Zealand to make the most of its energy potential: diverse resource development, environmental responsibility, efficient use of energy and secure and affordable energy. Each priority includes areas that the Government will focus on.

The following diagram sets out the structure of the strategy. There are areas of focus for the Government under each priority. These priorities and areas of focus are in no particular order.

AREAS OF FOCUS	PRIORITIES	GOAL
Develop renewable energy resources Develop petroleum and mineral fuel resources Embrace new energy technologies	Diverse resource development	**Make the most of our energy potential**
Best practice in environmental management for energy projects Reduce energy-related greenhouse gas emissions	Environmental responsibility	
Warm, dry, energy efficient homes An energy efficient transport system Enhance business competitiveness through energy efficiency Better consumer information to inform energy choices	Efficient use of energy	
Competitive energy markets Reliable electricity supply Oil security and transport	Secure and affordable energy	

Priority: Diverse resource development

Areas of focus

Develop renewable energy resources

Develop petroleum and mineral fuel resources

Embrace new energy technologies

New Zealand's energy resources already contribute to economic growth and promote the well-being of New Zealanders. They can contribute further, by:

- Bringing wealth to New Zealand through the export of energy products, expertise and technologies.
- Providing diverse sources of reliable energy at competitive prices within New Zealand.

This section sets out three broad areas in which the Government will focus its efforts to facilitate the commercialisation of energy resources.

Develop renewable energy resources

There are good reasons for developing a mix of renewable energy resources. Using a wide range of energy resources will help make New Zealand more resilient to fluctuating commodity prices, leading to improved energy security. In addition, using more renewable resources to meet energy demand will help reduce energy-related greenhouse gas emissions, improve air quality and health, and meet the renewable electricity target.

Renewable electricity generation target

The Government retains the target that 90 percent of electricity generation be from renewable sources by 2025 (in an average hydrological year) providing this does not affect security of supply.

New Zealand has an abundance of renewable resources for electricity generation. Renewables contributed 74 percent of electricity generation in 2010.

While providing low emissions electricity, our renewable choices help sustain our reputation as an environmentally-responsible nation.

The economic competitiveness of new renewable electricity generation will be enhanced by a price on carbon. The Government welcomes and expects to see considerably more investment in renewable electricity generation, particularly from geothermal and wind resources.

Achieving this target must not be at the expense of the security and reliability of our electricity supply. For the foreseeable future some fossil fuel generation will be required to support supply security.

New Zealand already has a substantial renewable energy base to build on. The Government's approach is to ensure market incentives and the regulatory framework support further investment in appropriate renewable projects by removing unnecessary regulatory barriers. The Government will work with industry, local government and other stakeholders to identify and remove these barriers.

Much has already been done. For example, the 2011 National Policy Statement on Renewable Electricity Generation requires that the national benefits of renewable electricity must be fully considered in the resource consenting process. By including a price on carbon, the Emissions Trading Scheme incentivises investment in renewable energy ahead of fossil fuels.

New Zealand has a range of emerging renewable energy resources with potential for future electricity, fuel and direct heat production. However, developers of these resources face challenges from immature markets, low consumer awareness, emergent technologies, uncertain environmental effects or lack of supporting infrastructure.

We are investigating ways to support the use and development of geothermal energy. The Government is also encouraging the marine energy industry as appropriate. Biomass is another resource that has considerable potential. The Government will encourage biomass-to-energy development, including through working with industry to support its bioenergy strategy.

Develop petroleum and mineral fuel resources

New Zealand already benefits substantially from the revenue gathered from the development and sale of petroleum and coal resources. However, most of New Zealand's territory is yet to be explored, and the potential for further development of petroleum resources is significant.

The Government wants New Zealand to be a highly attractive global destination for petroleum exploration and production investment so we can develop the full potential of our petroleum resources. Significant discoveries of oil and gas resources will help boost New Zealand's foreign earnings and domestic gas supplies.

We have an opportunity to expand oil and gas exports in what has become an increasingly significant industry for New Zealand. In the year to December 2010, crude oil was our fourth largest mercantile export[5]. Our oil and gas production could be substantially increased – potentially to the point where New Zealand becomes a net exporter of oil by 2030.

Our immediate focus is on increasing exploration activity and on improving the knowledge of our petroleum basins through the Petroleum Action Plan. We are:

- Reviewing the fiscal and royalty framework to ensure the Government receives a fair return from petroleum resources while providing sufficient incentives for investors.
- Investing in data acquisition to improve resource knowledge and foster more investment, particularly in frontier resources.
- Developing a fit for purpose legislative framework for the petroleum sector.

The Government will ensure good quality resource information is available to encourage competitive bidding for exploration of blocks of territory. The Government has committed funding for seismic studies in prospective basins.

We will also develop a pathway to realise the potential of New Zealand's gas hydrates endowment.

The Government will ensure regulatory settings maximise the return to New Zealanders while also promoting safety, preventing harm and requiring environmentally-responsible practices. It is important that all petroleum exploration and production activities have rigorous environmental and safety controls to manage risks, prevent harm to people and to minimise effects on the environment.

Embrace new energy technologies

Advances in energy technologies can allow New Zealand to take advantage of previously untapped energy resources or make better use of those that we currently utilise. Deploying new energy technologies offers significant potential to create wealth.

The Government has a role in encouraging the swift uptake of new energy technologies within New Zealand, and supporting the deployment of New Zealand energy technologies at home and overseas.

This year, the Government set up the Green Growth Advisory Group to evaluate and advise on opportunities for green growth to contribute to an increased rate of economic growth for New Zealand. The group will identify opportunities for smarter use of existing technologies and innovation, as well as greater development and adoption of new technologies (including clean technology) in our productive sectors.

The Government will continue to keep abreast of international developments and innovations. New Zealand is a member of international research partnerships seeking to develop new energy efficient technologies and to harness low emissions energy. For example, given New Zealand's fossil fuel endowment, the Government will continue to participate in international carbon capture and storage research initiatives.

Opportunities for New Zealand will be enhanced by leveraging our ongoing international energy relationships including through the International Energy Agency, the Asia-Pacific Economic Cooperation (APEC) Energy Working Group, the East Asia Summit Energy Cooperation Task Force, and the International Partnership for Energy Development in Island Nations.

The Government will prioritise research funding to areas based on New Zealand's resource strengths and unique characteristics, and where there is commercial potential. Government priorities for energy research, development, and deployment support are with bioenergy, marine, geothermal, petroleum, smart electricity network technologies and energy efficiency (at all levels of supply, infrastructure and demand).

The Government recognises that uptake of new energy technologies also depends on the trades and service sectors being capable of supporting new technologies. Where lack of capability creates a barrier to uptake, the Government will consider options to increase sector capability.

5 *Hot Off The Press Overseas Merchandise Trade: April 2011*. Statistics New Zealand; 2011.

Priority: Environmental responsibility

Areas of focus

Best practice in environmental management for energy projects

Reduce energy-related greenhouse gas emissions

New Zealand has an enviable and proud reputation as a 'clean, green' country. We are determined to maintain it by maximising development opportunities that benefit both the environment and economy.

Integrating responsible environmental management into the development and efficient use of energy resources is essential to New Zealand's long-term economic competitiveness in increasingly carbon-sensitive international markets, particularly for our agricultural exports and tourism.

Sourcing an increased proportion of New Zealand's energy from low emissions renewable energy will assist us to reduce our greenhouse gas emissions.

Best practice in environmental management for energy projects

Best practice in developing energy resources

The Resource Management Act 1991 (RMA) provides New Zealand with a resource management framework that gives due consideration to the benefits and adverse effects of developments. The Government's aim is to ensure this framework is administered effectively while minimising delays and costs for all parties.

Changes already made to the RMA give industry and communities greater confidence about when decisions will be made. Decisions for projects of national significance that are referred to the Environmental Protection Authority must be made within nine months.

National Policy Statements under the RMA already require RMA decision-makers to recognise the national significance of electricity transmission and renewable electricity generation. The sustainable management of energy resources is also addressed by the New Zealand Coastal Policy Statement and the National Policy Statement for Freshwater Management.

The Government has reviewed its environmental and safety regime to respond to concerns about marine oil spills. It is committed to ensuring all petroleum activities have rigorous environmental and safety controls.

'Best practice' can mean a number of things. Here it is meant to convey that New Zealand will strive to maintain our good environmental record internationally.

Best practice in the environmental effects of energy use

The Government will continue to ensure the adverse environmental effects of the use of various forms of energy are monitored and addressed accordingly. This will ensure New Zealand has best practice environmental management for energy projects.

Aside from the release of greenhouse gas emissions, using certain forms of energy can impact on air or water quality. Burning wood, coal or waste oils can release emissions (such as particulates) that can adversely affect human health, as can the combustion of fuel in the transport sector.

The Government will address issues relating to access to, or allocation of, natural resources to provide an optimal outcome for New Zealand. For example, the Government's Fresh Start for Freshwater programme will improve New Zealand's freshwater management. The National Policy Statement for Freshwater Management has already recognised the value of water for electricity generation.

Silver Fern Farms' Finegand meat processing plant in Balclutha is turning sludge from waste water into a valuable biofuel, reducing the company's CO_2 emissions by 9,500 tonnes per year. The company aims for best practice in environmental stewardship and industry innovation.

Reduce energy-related greenhouse gas emissions

The Government has set a target for a 50 percent reduction in New Zealand's greenhouse gas emissions from 1990 levels by 2050.[6]

New Zealand is willing to commit to reducing greenhouse gas emissions by between 10 percent and 20 percent below 1990 levels by 2020, if there is a comprehensive global agreement and certain conditions are met.

Government policies that will reduce energy greenhouse gas emissions include:

- The New Zealand Emissions Trading Scheme (NZ ETS).
- Facilitating greater investment in renewable energy and in energy efficiency and conservation.

The NZ ETS will be the primary means to reduce emissions in the energy sector, and all other sectors across the economy. A price on carbon emissions is already a feature of investment decisions and in improving the competitiveness of low emissions alternatives. Already the NZ ETS is encouraging investment in renewable energy ahead of more carbon-intensive forms such as coal.

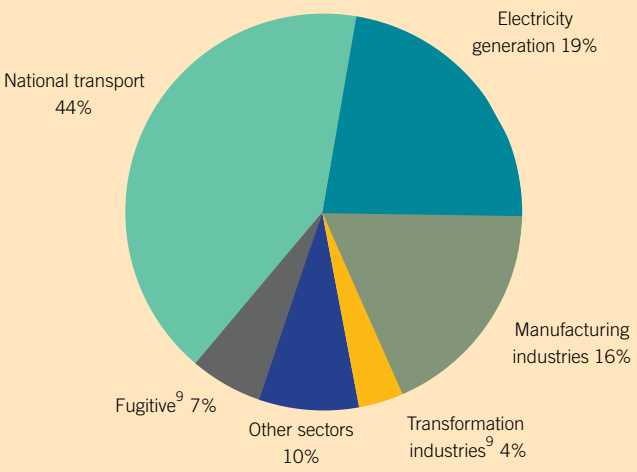
The Government's policies, to facilitate development of renewable energy in all forms, including for electricity, biofuels and direct heating, will also assist in lowering emissions. Continued promotion of energy efficiency will also contribute to reducing greenhouse gas emissions from energy, where it leads to fossil fuel savings.

Energy-related greenhouse gas emissions

The supply and consumption of energy accounted for 44 percent of total New Zealand emissions in 2009.[7]

The following chart provides a breakdown of energy emissions by sector in 2009.

Energy emissions by sector in 2009[8]



6 Details on Government targets are available at www.mfe.govt.nz/issues/climate/emissions-target-2020/

7 *New Zealand's Greenhouse Gas Inventory 1990-2009*, available at www.mfe.govt.nz/publications/climate/greenhouse-gas-inventory-2011/index.html

8 *New Zealand Energy Greenhouse Gas Emissions*. Ministry of Economic Development; 2010; p 10.

9 **Transformation industries**: Emissions arising from the combustion of fuel to transform energy to an altered form, such as petroleum refining and oil and gas extraction and processing.
Fugitive: Emissions arising from the production, processing, transmission and storage of fuels, such as coal, natural gas, oil and geothermal steam.
See *New Zealand Energy Greenhouse Gas Emissions*. Ministry of Economic Development; 2010; pp 16 & 20.

Priority: Efficient use of energy

Areas of focus

Warm, dry, energy efficient homes

An energy efficient transport system

Enhance business competitiveness through energy efficiency

Better consumer information to inform energy choices

Improving the efficiency of energy use is a priority because it is an 'enabler' rather than a goal in itself. It leads to a range of beneficial outcomes that support all the other priorities in this strategy, from economic growth to greenhouse gas reduction to energy security.

The three sectors where significant improvements can be made to energy efficiency are transport, business, and homes. In each of these areas, Government policies to support improvements in energy efficiency can in themselves provide opportunities for businesses, as well as improving energy performance and productivity.

Warm, dry, energy efficient homes

The Government is committed to improving home insulation and clean heating levels in existing homes. The Government wants New Zealanders to live in homes that are warm, dry and heated efficiently with clean sources of energy. The Government has recognised there are barriers to homeowners making energy efficient investments by themselves. As a result, it set up the Warm Up New Zealand: Heat Smart programme.

The Warm Up New Zealand: Heat Smart programme provides a subsidy to homeowners to install insulation and clean heating devices in their homes. This programme is proving successful at overcoming reluctance to invest and leveraging a significant investment by homeowners in better insulation. It has boosted the insulation industry and lifted the game for insulation practice. The programme aims to improve productivity and health outcomes, reduce energy costs, and stimulate the economy by generating jobs for New Zealanders involved in producing and installing insulation and clean heating.

The Government has committed more than $340 million over four years to the programme. This will assist at least 188,500 homes, including providing higher levels of support for at least 70,000 lower income households. Already the programme has resulted in over 100,000 homes being improved.

An energy efficient transport system

Oil provides half of the country's energy needs, with most of it consumed in transporting people and freight into, out of, and across New Zealand. Increasing efficiency offers major opportunities to make the most of transport fuels and improve productivity of the overall economy.

For transport, the Government's key focus will be on creating the most efficient mix of integrated modes and travel options for New Zealanders and our visitors. To do this the Government will continue to invest in:

- Roads of National Significance, as these routes will ease severe congestion in and around our five largest metropolitan areas, and link our major sea and air ports more effectively into the State highway network.
- A rail system that enables the efficient movement of freight and complements other modes of passenger and freight transport.
- Reliable and more cost effective public transport systems that offer benefits to attract a greater percentage of long-term users.
- Improvements to infrastructure for walking and cycling funded through the National Land Transport Fund.

The Government expects territorial local authorities to ensure integrated travel options through their transport and planning roles. They will work to improve the efficiency of local transport networks and layouts so that people and freight can move about more easily and efficiently.

Enhance business competitiveness through energy efficiency

Being energy efficient can save companies money, improve productivity and enhance competitiveness. However, businesses often fail to invest in energy efficiency, even when it is cost effective for them to do so.

The Government will continue to support energy efficiency initiatives for businesses with measures such as energy audits, support for energy efficient purchasing, grant and subsidy programmes, and building sector capacity and capability in energy management. The programmes will be refined and improved to target sectors where the greatest energy and cost savings can be made.

The Government encourages development and use of voluntary industry standards to rate building energy performance.

Waikato-based earthmoving and transport company **Ruakuri Contracting** won the 2010 EECA Transport Award. Between 2006 and 2009 it cut its fuel use by 13 percent and displaced over 90,000 litres of diesel with biodiesel, significantly reducing its carbon emissions.

Better consumer information to inform energy choices

To inform consumer choices around energy products and services, the Government is committed to:

- Providing energy efficiency labelling and standards for products in association with Australia.
- Reporting price margins for petrol and diesel.
- Reporting quarterly domestic electricity prices.
- Reporting bi-annual domestic gas prices.
- Funding, upgrading and promoting www.powerswitch.co.nz to provide electricity consumers with price comparisons between retailers.
- Providing information on a range of energy saving, renewable energy and energy efficiency options to households and businesses, such as through programmes run by the Energy Efficiency and Conservation Authority.

Products and smart technologies

Better information can assist consumers to identify areas of energy wastage, save money by making changes, and choose products or services that best meet their needs.

As smart meter technology is installed by companies, the Government will ensure consumer rights are protected, and will monitor the effect on consumer energy use and electricity bills.

The Government will encourage industry participants to explore the opportunities offered by smart meter, grid and appliance technologies in providing consumers with better information and options for their energy management.

The Government will be judicious in its use of energy labelling and standards for the energy performance of selected commercial and consumer products that use relatively large amounts of energy. The Government will ensure robust economic analysis, including consultation with industry and consumers, informs standards development.

Priority: Secure and affordable energy

Areas of focus

Competitive energy markets

Reliable electricity supply

Oil security and transport

High standards of energy security are critical to New Zealand's economic performance and social well-being – particularly in relation to oil and electricity.

Affordable energy is also fundamentally important to people, at home and in business.

The Government considers that secure and affordable energy is best achieved through competitive markets. In the longer term, investment in oil alternatives will boost transport energy security. An ongoing focus on the reliability of electricity is also needed to ensure we have robust electricity infrastructure in the 21st century.

Competitive energy markets

Competition in energy supply provides choice to consumers, places downwards pressure on prices and incentivises efficient investment.

The Government has an ongoing programme of ensuring energy markets continue to work effectively and competition is promoted.

Competitive electricity market

In 2009 and 2010, the review of the electricity market resulted in significant electricity market reforms.[10]

The reforms make it easier for more electricity retailers to operate across New Zealand, so customers will have more choice in providers. The Government has also established a three-year $15 million fund to promote customer switching. The Electricity Authority estimates that residential customers could save on average about $150 a year – or $240 million a year across all customers – by switching to the cheapest available retailer.

Consumer complaints are also dealt with more effectively. This helps to promote competition and improve the price and quality of goods and services. The Electricity and Gas Complaints Commission now has powers to resolve all electricity and gas disputes.

From these improvements, the Government expects to see continued downwards pressure on electricity prices, improved market performance and increased investment in generation, transmission and distribution.

Competitive gas market

The Government Policy Statement on Gas Governance sets out the Government's desired outcomes for achieving effective market arrangements across the gas industry. The aim is to ensure a competitive gas market that delivers for New Zealand.

Gas has been a major energy source in New Zealand for more than 30 years. Gas is an important feedstock for electricity generation. It is also an important direct source of energy in industry and homes. Discovery of more gas in New Zealand will provide more certainty for gas industry participants; hence the promotion of oil and gas exploration.

As the gas and liquefied petroleum gas (LPG) markets continue to develop, it is important to ensure reliable infrastructure and competitive markets, as gas has an important role to play in New Zealand's overall energy mix.

Overseeing oil markets

Petrol and diesel prices are largely determined by international oil markets. However, the Government does publicise oil prices and industry costs within New Zealand, to help determine whether prices at the pump fairly reflect industry costs.[11]

10 Details about the electricity market reforms are available at www.med.govt.nz/electricity

11 See www.med.govt.nz/oil/monitor

Reliable electricity supply

Long-term security and reliability of electricity supply requires regulatory certainty and effective and balanced rules. Having a reliable electricity system means having enough generation to meet demand and having a diverse range of energy sources and locations. A reliable electricity system also relies on an effective transmission and distribution system.

The Government's major electricity market review in 2009 resulted in a broad suite of proposals to increase security of supply. New measures to promote secure electricity supply include phasing out the reserve energy scheme and ensuring that market participants have clear incentives to manage risk. These incentives include a proposed floor on spot prices and requiring companies to compensate consumers during conservation campaigns.

As noted above, the Government will continue to focus its attention on resource management issues that inappropriately affect investment in electricity infrastructure.

In addition, the Government is seeking to improve the quality of information on gas reserves and encourage gas exploration and development to offset the decline of the Maui field. New gas finds will help support our electricity network.

Oil security and transport

The Government has injected new funds into upgrading transport infrastructure to create an efficient mix of integrated modes and travel options. Fuel prices strongly influence people's transport choices, and affect the uptake of low-carbon fuels, new technologies and more energy efficient vehicles, vessels and aircraft. Improving the efficiency of our fleets and transport networks will help reduce New Zealand's exposure to international fuel price volatility and potential price rises. The Government's Emissions Trading Scheme places a cost on the carbon emissions from fuel.

In addition, the Government is keeping a close eye on market developments to diversify New Zealand's fuel mix over time.

The Government maintains 90-day oil reserves to respond to a serious international oil supply disruption. We also have an Oil Emergency Response Strategy in place if needed.

What is energy security?

On a system level, energy security is achieved when there are sufficient levels of energy resources reliably delivered via robust networks to meet changing demands over time.

Security is enhanced where energy resources can be sustained environmentally, socially and economically over time.

More efficiency and flexible use of energy across the economy also contributes to system security.

Energy systems must have the resilience to cope with shocks and change, for example, natural disasters or international events. Obtaining energy from a diversity of sources, rather than being reliant on a few dominant sources, enhances energy security and resilience to shocks.

Individuals, businesses and communities are more resilient to supply disruptions when we have choices, for example in how we heat our homes or the transport we use.

Energy safety

Ensuring electricity, gas and other forms of energy are supplied and used safely is essential to New Zealand's social and economic well-being. The Government works with the public and industry to identify ways to provide acceptable levels of safety assurance while avoiding unnecessary compliance burdens on businesses.

Information on energy safety regulations is available at www.energysafety.govt.nz

The New Zealand Energy Efficiency and Conservation Strategy (NZEECS) is a companion to the Government's primary statement of energy policy set out in the New Zealand Energy Strategy.

This third edition of the NZEECS is prepared under the Energy Efficiency and Conservation Act 2000. The NZEECS sets the Government's policies, objectives, and targets for the next five years (2011–2016), and the means by which these will be achieved.

New Zealand Energy Efficiency and Conservation Strategy 2011–2016

Introduction

Making improvements in energy efficiency, energy conservation and renewable energy is an important priority for the Government.

The use of energy efficient technology and practices, energy conservation, and renewable sources of energy can:

- Enhance economic growth through increased productivity.
- Improve energy security by reducing energy demand, including for imported sources of energy.
- Assist with energy affordability by reducing consumer energy costs.
- Defer the need for more expensive energy supply by making better use of existing energy.
- Reduce greenhouse gas emissions from energy.
- Improve people's health, well-being and productivity through warmer and more energy efficient homes.

As such, the New Zealand Energy Efficiency and Conservation Strategy (NZEECS) contributes to the delivery of the Government's energy priorities set out in the New Zealand Energy Strategy.

Feedback to the draft NZEECS illustrates that organisations in many industries play an important role in energy efficiency, energy conservation and renewable energy. The Government encourages this involvement. Energy performance can be improved in buildings, vehicles, farming, horticulture, industrial processing, tourism operations, utilities and every other sector. The Government expects the public sector to demonstrate prudent cost-effective energy management.

Equally, the ideas and interest shown from individuals demonstrates there is much we can all do to manage our energy use more efficiently and effectively, for both personal and wider benefit.

Policies and partnerships

Effective energy markets are critical to improvements in energy intensity. Yet markets range in their level of sophistication and development. Households and firms often do not make the necessary investments to realise existing and emerging energy productivity opportunities.

Commercial investors in particular seek stability in Government policy, and durability of strategic direction. The Government acknowledges a more stable policy environment supports greater levels of investment in renewable energy and improvements in energy intensity.

The NZEECS promotes the careful use of a mix of Government measures, which can be grouped as:

- Information – targeting consumer and business needs.
- Incentives – funding or financial products to help build capability and leverage investment.
- Codes and standards – to underpin confidence in energy efficient products and practices.
- Research and development – to support innovative capability.

These measures may often be delivered in partnership with industry associations, not-for-profit energy trusts, and other parties.

The exact mix of measures adopted by relevant Government agencies to deliver the NZEECS will vary according to the scale of the opportunities and the specific needs of stakeholders.

Decisions on any proposed initiatives will be based on a full assessment of costs and benefits.

Energy intensity is the energy used per unit of gross domestic product (GDP), here expressed as gigajoules per $1,000 GDP.[12]

12 For more information on New Zealand's energy intensity, see *New Zealand Energy Data File.* Ministry of Economic Development; 2010; p 15.

Economy-wide target to 2016[13]

The NZEECS builds on achievements to date and focuses on five-year targets and objectives, 2011–2016, to provide consistency and certainty for investment.

The Government's energy efficiency target is for New Zealand to continue to achieve a rate of energy intensity improvement of 1.3 percent per annum.

Achieving the target will require a close partnership between Government, firms, local government, not-for-profit organisations, and households to develop the right mix of new policies and programmes to fully realise the opportunities that exist.

Sector targets

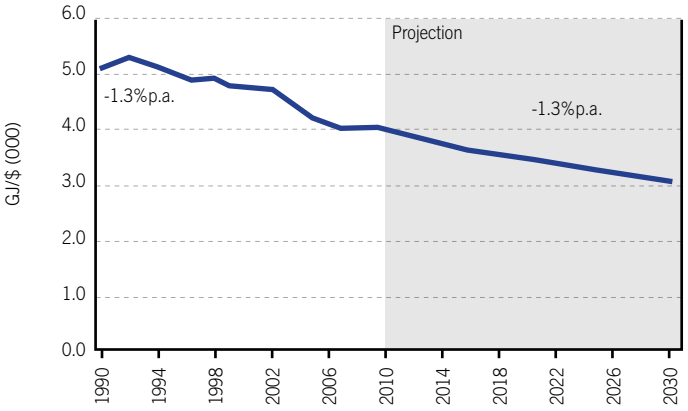
The economy-wide target is shared between four key sectors. Significant energy savings are anticipated to come from improved energy efficiency in each sector.

The potential for energy efficiency improvements provides a guide to policy priorities. The greatest areas of potential improvement are the transport and business sectors, followed by the residential sector.

The table overleaf lists the NZEECS sector targets and objectives.

The NZEECS targets and objectives provide a clear direction and rationale for future policy and action. They also provide all parties involved with the scope to think laterally about how to realise the strategy's outcomes – a necessary requirement when the economics of energy technologies and practices are constantly changing.

Consumer energy intensity[14]



Accountabilities

This document is the third strategy prepared under the Energy Efficiency and Conservation Act 2000 to give effect to the Government's policy on the promotion of energy efficiency, conservation, and the use of renewable sources of energy.

The NZEECS's targets and objectives can only be delivered with active involvement from householders, firms, and a wide range of central and local government agencies and other organisations.

The means by which the Government intends to work with stakeholders to achieve the proposed objectives and targets in this NZEECS are outlined in the 'Policy' sub-sections for each sector.

Throughout the NZEECS, the lead central Government agency and support agencies for its delivery are identified. This is not to downgrade the importance of all stakeholders in getting behind the delivery of the NZEECS, but rather to ensure an appropriate level of Government oversight.

The wider accountability framework for the NZEECS is described in the 'Governance' section towards the end of this document.

13 The economy-wide target is derived from the Ministry of Economic Development's modelling for *New Zealand's Energy Outlook 2010*.

14 *New Zealand Energy Outlook 2010, Reference Scenario and Sensitivity Analysis*. Ministry of Economic Development; 2010; p 2.

Sector objectives and targets

Objectives	Targets
Transport A more energy efficient transport system, with a greater diversity of fuels and alternative energy technologies.	By 2016: The efficiency of light vehicles entering the fleet has further improved from 2010 levels.
Business Enhanced business growth and competitiveness from energy intensity improvements.	By 2016: An improvement in the commercial and industrial sector energy intensity level (GJ/$1,000 of GDP). By 2025: We will utilise up to 9.5 PJ per year of energy from woody biomass or direct use geothermal additional to that used in 2005.
Homes Warm, dry and energy efficient homes with improved air quality to avoid ill-health and lost productivity.	By 2013: Insulate 188,500 homes.
Products Greater business and consumer uptake of energy efficient products.	By 2016: Extend minimum energy performance standards, labelling and EnergyStar product coverage to remain in line with major trading partners.
Electricity System An efficient, renewable electricity system supporting New Zealand's global competitiveness.	By 2025: 90 percent of electricity will be generated from renewable sources, providing supply security is maintained.
Public Sector Greater value for money from the public sector through increased energy efficiency.	By 2016: Improve energy use per full-time staff equivalent compared with a 2010 baseline.

Official records of programme details

The NZEECS does not contain a full list of Government energy efficiency initiatives. As a statutory document with a five-year life, the NZEECS has been presented so as to ensure it won't be out-of-date as initiatives come and go over that period.

Initiatives provided by the public sector agencies listed in this strategy will be noted in their public documents, such as their statements of intent, which are published on their websites.

Information about energy efficiency and renewable energy

The Energy Efficiency and Conservation Authority (EECA), is the primary Government agency charged with promoting energy efficiency and renewable energy. Information about EECA's programmes can be found at:

www.eeca.govt.nz – all EECA programmes for householders, communities, business, Government, and local government.

www.eecabusiness.govt.nz – energy advice and support targeted at businesses.

www.energywise.govt.nz – energy advice and support targeted at householders.

These website links are also helpful:

www.rightlight.govt.nz – information about efficient lighting.

www.transport.govt.nz/ourwork/climatechange – Ministry of Transport information and initiatives relating to climate change and energy.

www.safednz.govt.nz – Safe and Fuel Efficient Driving New Zealand website, a driver development course for truck, bus and coach drivers.

www.rightcar.govt.nz – information on how vehicles rate for fuel economy, safety, CO_2 emissions and pollutants.

www.fuelsaver.govt.nz – information on vehicle fuel efficiency and tips on improving efficiency through driving behaviour and car maintenance.

Transport

Objective

A more energy efficient transport system, with a greater diversity of fuels and alternative energy technologies.

Target

By 2016: The efficiency of light vehicles entering the fleet has further improved from 2010 levels.

Responsibility

Lead: Ministry of Transport.

Support: New Zealand Transport Agency; Ministry of Economic Development; Energy Efficiency and Conservation Authority; Civil Aviation Authority.

Rationale

Oil provides 51 percent of New Zealand's total consumer energy. The transport sector is the primary user of this energy.

Most of this oil is imported, which exposes the New Zealand economy to volatile international energy prices. More efficient use and greater use of alternative transport fuels can reduce our exposure to oil prices.

It is therefore a long-term strategic priority for New Zealand to ensure that energy efficiency opportunities in the transport sector are fully realised.

The relatively poor historic fuel economy of the New Zealand vehicle fleet is an important energy challenge facing the economy. While fuel efficiency is improving, projected rates of improvement in the efficiency of the light vehicle fleet may not be sufficient to keep pace with improvements in other OECD nations. This could place New Zealand at a competitive disadvantage.

Energy efficient transport technologies and driver practices helps keep fuel bills down. This helps households' living standards and the international competitiveness of firms.

The Government has identified opportunities for better integration of road freight with rail, shipping, and air freight networks, and ports and airports serving both local and international markets. The Government has invested significantly in the Kiwirail Turnaround Plan to develop rail freight as a viable modal option.

Policy

The means by which the Government proposes to achieve this strategy's objective and targets for the transport sector include a mix of information, incentives, capability building, and codes and standards.

An integrated mix of policies is required to achieve energy efficiency gains in the transport sector. No one policy can make the most of the transport sector's energy efficiency potential.

Quality roads and public transport services are essential to maximise the efficiency of the transport network. The Government has invested new funds into upgrading transport infrastructure to create an efficient mix of integrated modes and travel options. Greater use of public transport in larger urban areas also helps reduce road congestion.

Ensuring the integration of modes in urban planning is an important role for local government.

Local authorities, through their transport and urban planning roles, are encouraged to continue to improve the energy efficiency of transport networks and the layout of urban areas so that people and freight can move about easily and more energy efficiently.

The Government recognises that vehicle fuel economy labelling for all post-2000 light vehicles is having a positive impact on vehicle purchase decisions. The Government will consider cost effective options to continue to improve the energy efficiency of the New Zealand vehicle fleet.

The Government considers improving the efficiency and reliability of key freight corridors and the metro passenger networks to be a priority, as well as achieving better integration of regional freight movement across road, rail, sea, and air.

The Government will:

- Continue to support improvements to road and public transport, including electrifying the Auckland rail system and upgrading the Wellington rail system.
- Continue to fund transport infrastructure to support people to make energy efficient transport choices. This includes encouraging the use of different modes of travel, particularly in urban areas for example, walking, cycle ways and public transport systems, as well as reducing congestion on the roading system.
- Promote efficient business fleet management through provision of information and audit programmes, such as professional driver training under the Safe and Fuel Efficient Driving New Zealand (SAFED NZ) brand.
- Encourage the entry of alternative transport fuels and electric vehicles in the New Zealand market.

The Government recognises that alternative transport fuels derived from a range of sources have the potential to contribute to the development of a more energy efficient transport system. The Government supports the actions of industry, such as the aviation industry's efforts to develop sustainable alternative fuels and to implement fuel and energy efficient measures, as air transport is strategically important to New Zealand industry.

Business

Objective

Enhanced business growth and competitiveness from energy intensity improvements.

Targets

By 2016: An improvement in the commercial and industrial sector energy intensity level (GJ/$1000 of GDP).
By 2025: We will utilise up to 9.5 PJ per year of energy from woody biomass or direct use geothermal additional to that used in 2005.

Responsibility

Lead: Ministry of Economic Development; Energy Efficiency and Conservation Authority.

Support: Department of Building and Housing; Ministry of Agriculture and Forestry; Ministry of Science and Innovation.

Rationale

Many New Zealand service, agricultural and manufacturing companies aim to maximise the productivity of their processes and supply chains. Optimising energy performance and making energy savings can result in significant cost savings. An excellent energy record can assist firms in marketing their products in environmentally conscious export markets. Consumers increasingly seek information on energy efficiency and energy-related greenhouse gas emissions when making purchases.

While many companies are already engaged in improving their energy intensity, significant improvements can be made across the sector. This includes in commercial building management, industrial processes and transportation. And with technology advances, continuous improvement is possible.

That said, New Zealand is a small economy and the level of capability, particularly of many small and medium sized firms, to fully exploit opportunities is constrained. The energy component of many business cost profiles, particularly in small and medium sized enterprises and service sector businesses, is often relatively small and regarded as a fixed cost. Energy often does not merit significant management attention.

Larger businesses and industry groups who are leaders in energy management can assist in raising the bar, and in encouraging New Zealand companies in general to improve their energy management. With better access to credible information about their energy use and the options available to them, businesses will be able to make smarter energy decisions. Good information and analysis can reduce risk and uncertainty, and support firms to obtain finance for demonstrably viable energy efficiency and renewable energy projects.

New Zealand has a small number of energy consultants and energy service companies. These specialist services can assist firms with energy analysis and improvement. Greater use of, or partnering with, energy specialists can add value to firms for whom energy is not their core business.

Opportunities also exist for firms to consider using renewable energy sources, such as biomass or geothermal heat on-site for their heating, fuel, and electricity needs. The economics and performance of many technologies are established. These options are particularly relevant for agricultural, horticultural and primary processing industries where local materials – often waste products – are available. With better access to information, capability and capital, firms can realise these opportunities.

Policy

Assisting businesses to improve their energy productivity is a high priority. The Government will improve its programmes for business to ensure the right mix of information, incentives, codes, and standards are in place.

The means by which the Government will work with businesses to achieve the business objective and targets includes work to:

- Encourage businesses to factor in operational costs as well as capital costs when investing in assets – the longer term energy savings may be worth a slightly higher upfront cost.
- Build management capability, including in small and medium enterprises, to identify and exploit opportunities to ensure energy intensity good practice is reflected in mainstream business planning.
- Encourage major firms proficient in energy efficiency practices to champion good practice across the wider business community.
- Prioritise energy research and development funding to develop renewable energy and demand side management technologies that improve energy security, and efficient and affordable energy use.

Business *continued*

- Build recognition of the value that can be added though the expertise of energy consultancies and service companies. Overseas, such companies have been credited with expanding funds available to finance energy efficiency projects.
- Improve the capability and capacity of energy auditors/assessors and their professional bodies.
- Assist industry to recognise and exploit opportunities for utilisation of geothermal and bioenergy sources.

In early 2011, the Government set up the Green Growth Advisory Group. One of the Group's Terms of Reference is the options for our small and medium sized businesses to move to a lower carbon economy while sustaining the desired level of productivity growth. The Group's report is expected to influence any actions the Government takes in the business energy efficiency area.

The New Zealand bioenergy strategy, developed in 2010 by the bioenergy and forest industries, is a good example of these industries working across their sectors and with business customers to create greater value from New Zealand's forestry and other biological resources. Over the next five years, the industry will develop markets for existing biomass and waste resources to build the platform for future innovation.

Downer New Zealand was the Supreme Winner in the 2010 EECA Awards. Downer New Zealand averaged energy savings of 25 percent across its energy-intensive asphalt plants, shaving more than $3 million off its annual fuel costs alone in just two years. Downer's New Zealand achievements have become a model for the global group.

The Government acknowledges the value of energy efficiency innovations (such as more efficient lighting and motor systems) being supported into the market. Support can be provided by targeted, time-limited information and incentives programmes. In this way markets can be transformed and the use of more efficient products and practices embedded.

Commercial buildings

Energy efficient commercial building design and the use of building materials that enhance energy efficiency offer major opportunities to lock in substantial energy savings through a building's life.

To assist the raising of building performance, the Government will continue to invest in further research into how energy is used in buildings.

The Building Code provides minimum standards for energy use for heating, ventilation and cooling and lighting. These standards will be reviewed in response to new research, building practices and technologies.

The Government supports the adoption of market-based solutions that set aspirational goals above minimum standards. This includes the use of building performance rating tools that enable market differentiation for high-performing buildings.

Trends towards more energy conscious building design, including the adoption of renewable sources of energy such as rooftop solar photovoltaic systems, require greater building management and technical expertise and experience. A greater degree of building specification requires greater levels of skill and knowledge in building professionals, including designers, developers and building managers. The Government will further invest in building the capability and capacity of the building and construction sector.

Homes

Objective

Warm, dry and energy efficient homes with improved air quality to avoid ill-health and lost productivity.

Target

By 2013: Insulate 188,500 homes.

Responsibility

Lead: Ministry of Economic Development; Energy Efficiency and Conservation Authority.

Support: Department of Building and Housing; Housing New Zealand Corporation.

Rationale

Many New Zealand homes are inadequately insulated and have inefficient space and water heating systems. This means they are difficult and expensive to heat and as a result are often cold and damp.

Cold and damp homes cause health problems, particularly respiratory illnesses, that result in days off work and school.

Householders often want to make improvements but lack access to capital and credible information to make informed energy efficiency investment decisions.

Property investors lack the incentive to invest in improvements when they themselves do not realise the benefits of reduced energy costs.

A lack of information and expertise often results in decisions at the design and build stage that lock future owners and occupiers into higher energy costs.

Trends towards more energy conscious technologies and practices require greater technical expertise and experience in the building sector.

Barriers to the uptake of residential energy efficiency options are best addressed in a systematic and coordinated manner.

Homes *continued*

Policy

The Government is committed to improving the energy performance of new and existing homes through the use of energy efficiency and renewable energy technologies. Insulation and clean home heating improvements support better health outcomes and home energy affordability.

By 2013 the Government expects to have supported the insulation and clean heating of more than 188,500 homes through the Warm Up New Zealand: Heat Smart programme.

The programme provides an incentive for homeowners to invest in improving their homes, and leverages further investment by banks, finance companies, local authorities and energy companies.

The Government acknowledges the role of clean and efficient space and water heating systems in reducing consumer energy costs and improving air quality.

The Building Code sets requirements for the energy performance of homes. Recent increases in requirements are expected to deliver ongoing energy savings. As new technologies and building practices emerge, new cost-effective ways of achieving energy efficiency may lead to an increase in Code requirements and relevant standards.

In addition, the Government will work with industry to identify and develop a range of market measures targeting the energy productivity of New Zealand's homes.

The Government supports industry in developing innovative voluntary solutions. The Homestar™ rating tool, launched in November 2010, is a good example. Homestar™ includes a free initial online assessment allowing owners to provisionally assess their home's performance in relation to comfort, health and energy efficiency. This can be followed up with a certified assessment to gain a star rating. The rating tool was developed by a joint venture partnership between BRANZ, Beacon Pathway and the New Zealand Green Building Council with the support of the building industry and key Government agencies, including the Department of Building and Housing and the Energy Efficiency and Conservation Authority.

Upgrading the state and local government housing portfolio to an appropriate modern standard also provides an opportunity to further exploit energy intensity improvement opportunities in the building and construction sector.

The Government will continue to support improvements to the capability of the wider home building sector (such as architects, engineers, developers, product suppliers, installers, and builders) through information, training and accreditation programmes.

The Government will also continue to provide information and advice to local authorities. Local planners and building inspectors have an important role in supporting efficient building design through the consenting process.

Energy efficiency information is available to assist homeowners and building owners:

www.energywise.govt.nz – energy advice and support targeted at householders.

www.homestar.org.nz – find out how well your home performs with a simple online assessment.

www.smarterhomes.co.nz – helps create healthier, affordable homes for better living with advice on buying, renovating and designing homes.

www.consumerbuild.org.nz – provides clear, independent and up-to-date information to the public about building, buying, renovating and maintaining houses in New Zealand.

Products

Objective

Greater business and consumer uptake of energy efficient products.

Target

By 2016: Extend minimum energy performance standards, labelling and EnergyStar product coverage to remain in line with major trading partners.

Responsibility

Lead: Energy Efficiency and Conservation Authority.

Support: Ministry of Economic Development.

Rationale

The changing composition of the economy towards service industries and the rapid growth of mass markets for new consumer technologies are resulting in increased energy demand from electrical equipment and appliances.

Markets for electrical equipment and appliances are diverse, international, and prone to information asymmetries. Firms and households often make purchase choices unaware of the long-term energy costs of the products, which may be many times more than the initial purchase cost.

Such issues, combined with the global diffusion of mass consumer technologies, suggest that harmonised international and regional standards and information programmes provide an effective mix of policies to help markets deliver energy efficient products.

Policy

The economy-wide energy intensity target will be supported by economy-wide codes and standards for commercial and consumer electrical products and information programmes.

The Government will be judicious in its use of such policies. Minimum Energy Performance Standards and related energy labelling will only be used on selected products that use relatively large amounts of energy. The Government will ensure robust economic analysis informs standards development.

This work will be conducted in partnership with Australian regulators, and will continue to be developed in close partnership with affected industries and consumers.

Having common standards and energy labelling information supports closer economic relationships with Australia. It reduces compliance costs for product manufacturers and suppliers who are often trading in both countries.

In addition, the Government will judiciously use a range of incentives to retire obsolete products from the market.

Electricity system

Objective

An efficient, renewable electricity system supporting New Zealand's global competitiveness.

Target

By 2025: 90 percent of electricity will be generated from renewable sources, providing supply security is maintained.

Responsibility

Lead: Ministry of Economic Development.

Support: Electricity Authority; Ministry for the Environment; Energy Efficiency and Conservation Authority.

Rationale

Renewable electricity

74 percent of New Zealand's electricity is already generated from renewable sources of energy: hydro; geothermal; and wind. Consequently, our greenhouse gas emissions intensity for electricity generation is low compared to other countries.

A low-emissions electricity system provides New Zealand with a distinct energy advantage over our trading competitors. It also is a tangible demonstration of New Zealand's environmental responsibility.

New Zealand is targeting 90 percent of electricity generation to be from renewable sources by 2025, providing electricity supply is secure. This target is challenging but realistic, given New Zealand's untapped renewable energy potential, our expertise in renewable development, and our Emissions Trading Scheme.

That said, the electricity system faces a number of challenges to the achievement of this goal. New projects face consenting restraints. Integrating intermittent renewable energy into the existing system creates system challenges. Some types of renewable energy are located in areas remote from the main grid, requiring transmission investment.

Electricity efficiency

Investing in electricity efficiency and demand management can often be more cost effective than building new supply, and often faces fewer risks. Promotion of electricity efficiency as a priority also recognises that new electricity developments, including renewable electricity development, come at a cost, including their environmental impact.

Emerging technologies

Emerging electricity technologies present opportunities for the electricity industry to develop in new directions. New Zealand has an international advantage in the relatively small size and stand alone nature of the grid, its current high level of renewable generation compared to many other jurisdictions, and in its strong, competitive market conditions. We are in a good position to trial, develop and integrate new technologies and be at the forefront of potentially far-reaching electricity system developments in the 21st century.

Smart grid infrastructure offers more intelligent network management. Smart grid technology could enable higher levels of distributed generation and smaller-scale generation to integrate into the system. Smart metering can provide greater levels of consumer information, influencing electricity use and potentially being a powerful force for promoting electricity conservation.

Future sources of generation, such as marine energy, may have different supply profiles. Future new demand, such as from electric vehicles, may create new demand profiles. A responsive electricity system informed by a forward-thinking policy environment will ensure future opportunities are realised and future risks are managed, while maintaining a secure electricity network.

Electricity system *continued*

Policy

The Government will continue to set the framework and incentives for a competitive electricity market to deliver the 90 percent target, including by:

- Removing unnecessary barriers to investment in large-scale renewable electricity generation, such as further improving consenting processes under the Resource Management Act and supporting the implementation of the National Policy Statement on Renewable Electricity Generation to provide clear guidance to councils.
- Incorporating the cost of greenhouse gas emissions into electricity investment decisions through the New Zealand Emissions Trading Scheme.
- Fostering the deployment of new renewable sources such as marine energy.
- Ensuring the electricity sector has an appropriate focus on electricity demand management tools.

Building on the solid framework and incentives in place for the electricity market, the Government will promote a coordinated approach to emerging electricity system technologies. The Government will further consider its role in promoting new electricity industry development and in addressing market failures and system constraints on new technologies. The scope of this work includes:

- The future role of distributed generation and barriers to its deployment.
- The impact of new renewable generation technologies on the electricity system.
- System requirements of smaller-scale generation technologies.
- Demand management opportunities, including opportunities for more efficient use of electricity.
- The risks, opportunities and growth path of smart grid infrastructure.
- Smart metering opportunities and risks.

The Government will monitor industry rollout of smart meter, smart network and smart appliance technologies, to promote consumer choice and a more efficient electricity system.

The Government wishes to see a responsive and future-focused electricity system taking advantage of new technology opportunities and welcoming new investors. It wants the electricity system to take advantage of new smart technologies to promote energy conservation to consumers and to improve energy efficiency.

The Electricity Industry Act 2010 provides lines companies with the option of developing smaller-scale electricity generation. This change is expected to provide new options for remote communities presently serviced by uneconomic lines.

The Government expects all parties responsible to minimise lines losses and make efficiency gains in the operation of the electricity system, and plan ahead to ensure the system can securely support a greater proportion of renewable generation and integrate new technology in the future.

Meridian Energy's West Wind wind farm, to the west of Wellington, was fully commissioned in October 2009. It generated 497 gigawatt hours (GWh) in the year to 30 June 2010.

The public sector

Objective

Greater value for money from the public sector through increased energy efficiency.

Target

By 2016: Improve energy use per full-time staff equivalent compared with a 2010 baseline.

Responsibility

Leads: Ministry of Economic Development; Energy Efficiency and Conservation Authority.

Rationale

Government, in its day-to-day delivery of services, can act as a powerful lever for greater energy awareness and productivity.

Goods and services purchased by central and local government form a significant component of the economy. At national and local levels, Government is a major owner of assets and is a major energy user.

Energy intensity improvements by all Government agencies can make an important contribution to the Government's drive for public services that provide greater value for money.

Public amenities, being by nature public, also are in the prime position to demonstrate best practice in energy performance to the wider community.

Policy

The 'public sector', for the purposes of this section, is defined broadly to include all agencies that are paid for and accountable ultimately to central or local government administration. It includes schools and hospitals, council controlled organisations and Crown entities.

The Government continues to promote value for money practices in the public sector. As part of its prudent management of public assets, the Government will seek to identify viable energy intensity improvement opportunities.

Government's procurement reform provides one important lever to support public sector agencies in making energy efficient choices in the purchase and lease of energy efficient products.

In addition to improving the energy performance of its own assets and operations, local government has a significant role in providing community leadership, long-term investment planning and implementing building, resource management, and transport legislation.

In recognition of the importance of local government to the realisation of the strategy's goals, the Government will continue to encourage local government to think strategically about energy issues.

Governance

Delivery

The New Zealand Energy Efficiency and Conservation Strategy (NZEECS) is a New Zealand Government strategy, and as such, the responsibility for delivery of the policies, objectives and targets lies with a number of ministerial portfolios and public sector agencies.

The Minister of Energy and Resources, supported by the Ministry of Economic Development and the Senior Energy Officials Group (comprising representatives from identified agencies) will oversee the NZEECS's delivery across portfolios.

The lead and support agencies identified in the NZEECS will be required to develop appropriate policy measures that contribute to the realisation of the NZEECS's targets and objectives. Policy measures will be recorded in annual output agreements with respective ministers and in statements of intent presented to Parliament.

Any new policy proposals, including new regulatory, programme, or funding proposals, will be subject to Cabinet decision-making processes prior to final approval. The final choice of policy to give further effect to realising the strategy's objectives and targets will remain the prerogative of the Cabinet and where appropriate Parliament.

When determining the means by which the policies, objectives and targets in this strategy are to be achieved, the Government will have regard to the following key questions:

- Does the policy proposal address a problem negatively affecting the NZEECS's objectives?
- Do the benefits of the proposed policy or programme outweigh its costs?

Collecting information

Supporting the Government's approach will be investment in quality energy end-use data. Good data is critical for reviewing existing programmes and informing new policy design.

Improved energy supply and end-use data has been published by the Ministry of Economic Development, Statistics NZ and the Energy Efficiency and Conservation Authority. Statistics NZ will also be publishing energy end-use sector statistics each year. The Building Energy End-use Study, a six-year study of energy use in commercial buildings, will also be completed.