



## New Zealand **Energy Strategy**

# Developing our energy potential

and the New Zealand  
**Energy Efficiency and Conservation Strategy**



# Contents

## **New Zealand Energy Strategy**

Foreword	1
Introduction	2
Feedback from consultation	3
Realising our potential	4
Our future	6
The strategy	8
Priority: Develop resources	10
Priority: Secure and affordable energy	13
Priority: Efficient use	17
Priority: Environmental responsibility	20
Implementing the strategy	22

## **New Zealand Energy Efficiency and Conservation Strategy**

Introduction	24
Transport	27
Business	28
Homes	30
Products	32
Electricity system	33
The public sector	35
Governance	36

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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.

New Zealand is blessed with extraordinary energy resources, which have the potential to make a significant contribution to our prosperity and our economic development.

Most New Zealanders know that we have an abundance of renewable energy resources. We continue to be a world leader in geothermal energy. Our rivers and lakes have long provided clean hydro-electricity. 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.

What is less well known is that along with our renewable resources, we also have an abundance of petroleum and mineral resources. More than 1.2 million square kilometres of our exclusive economic zone are likely to be underlain by sedimentary basins thick enough to generate petroleum. Recent reports put New Zealand's mineral and coal endowment in the hundreds of billions of dollars.

For too long now we have not made the most of the wealth hidden in our hills, under the ground, and in our oceans. It is a priority of this government to responsibly develop those resources.

The New Zealand Energy Strategy sets the strategic direction for the energy sector and the role energy will play in the New Zealand economy. The government's goal is for the energy sector to maximise its contribution to economic growth. The Strategy focuses on four priorities to achieve that: developing resources; promoting energy security and affordability; achieving efficient use of energy; and environmental responsibility.

This New Zealand Energy Strategy includes the New Zealand Energy Efficiency and Conservation Strategy. Energy conservation and efficiency has an important role to play in economic growth. All New Zealanders benefit from more effective use of our resources. The Energy Efficiency and Conservation Strategy is therefore all about 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**



# Introduction

The New Zealand Energy Strategy provides the government's direction for energy and the role energy will play in New Zealand's economy.

This document replaces the 2007 New Zealand Energy Strategy. It fits energy within the government's overarching goal, to grow the New Zealand economy to deliver greater prosperity, security and opportunities for all New Zealanders.

This strategy sets out the government's priorities that will allow New Zealand to make the most of its energy resources, while being environmentally responsible. It covers the supply, delivery and use of energy. It offers direction for the energy industry; for energy-related aspects of transport, housing, research and development; and infrastructure. It is not intended to offer detailed lists of actions, but rather to provide strategic direction.

The last section is the New Zealand Energy Efficiency and Conservation Strategy, which provides direction more specifically for energy efficiency, renewable energy and energy conservation.

# Feedback from consultation

The large number of quality submissions on the draft New Zealand Energy Strategy and the draft New Zealand Energy Efficiency and Conservation Strategy (NZE ECS)<sup>1</sup> indicated a high level of interest in the draft strategies.

The government's goal to develop our resources – including mineral fuels such as petroleum and coal – was both praised and criticised. Industry submitters from a broad range of sectors praised the positive signals the strategy provided for them to get on with the job. Environmental organisations and most individual submitters wanted the government to focus less on mineral fuels and more on fostering renewable energy, new technologies and energy efficiency to reduce energy related greenhouse gas emissions.

The government is interested in pursuing energy initiatives that have both an economic benefit and a positive overall effect on the environment. In the broader sense, such 'win-wins' also positively contribute to a good international reputation for New Zealand.

The government confirms in this strategy that renewable energy development, promotion of innovation in energy technologies and energy efficiency are all priorities. These things can improve economic wealth and reduce greenhouse gas emissions.

The mineral fuel resources, particularly coal and petroleum (oil and gas) are an important part of the energy picture. They provide significant export earnings to New Zealand, employment and essential fuels for many industrial processes. The government is committed to ensuring the resources are developed in an environmentally responsible manner and that health, safety and environmental risks are managed well. The New Zealand Emissions Trading Scheme introduces a price on carbon emissions.

Submitters were supportive of government promotion of energy efficiency. Many wanted promotion of energy efficiency to have a higher priority. The four priorities in this strategy are not numbered for a reason – they are the four legs to the table and all are needed for New Zealand to prosper. The government is committed to promoting energy efficiency as a priority and will continue to do so.

Some submitters wanted to see more detail in the strategies, particularly in the NZE ECS. Other submitters liked the high level strategic picture painted of the government's approach. The decision to not list specific programmes will ensure that the strategies remain relevant over the next five years. The 2011 NZE ECS sets clear targets, objectives, policy directions, acceptable means, and names the government agencies responsible for facilitating delivery. Details of government energy programmes are available elsewhere. This approach is also more honest. Goals will be achieved not due to lists in the NZE ECS, but due to ongoing Cabinet commitment to prioritise energy efficiency across its overall work programme to meet its obligations and targets set out in the NZE ECS.



<sup>1</sup> A summary of submissions and resulting recommendations is available at [www.med.govt.nz/energy-strategy](http://www.med.govt.nz/energy-strategy).

# Realising our potential

The New Zealand Energy Strategy provides the strategic direction for the supply and use of energy to contribute to the growth of the New Zealand economy for the benefit and well-being of all New Zealanders.

New Zealand has an abundance of diverse energy resources. The government aims to harness their potential to deliver a transformation of the economy.

Our geological history has provided us with rich mineral and petroleum resources, only a small proportion of which have been tapped to date.

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

We have abundant untapped solar energy and could potentially harness the power of the oceans that surround us. Extensive farming and forestry areas offer opportunities to utilise biomass to yield heat, electricity, and biofuels.

As New Zealanders, we pride ourselves on being nimble and quick to adopt new technologies and to develop leading technologies. And as a small, stable, democratic country with an open, internationally-focused economy, New Zealand is in a good position to attract investment and make the most of all we have.

## Our energy future underpins our economic future

Energy is more than just another commodity: it is an essential input to all sectors. New Zealand's economic competitiveness rests on its ability to respond positively to global energy risks and opportunities.

The future is one in which we expect:

- The cost of greenhouse gas emissions to be increasingly factored into world markets.
- Technological advances to occur in energy production, electricity systems, and energy management in buildings, industry and transport.
- The price of oil to rise and become more volatile.

International investment into new renewable technologies will likely open new domestic and export opportunities to New Zealand researchers and companies. New technology will also give rise to new challenges and opportunities for the current electricity, oil and gas systems, and for training New Zealand's workforce for the future.

The introduction of a price on carbon, and anticipated future oil price rises are expected to lead to more investment into alternative fuels and technologies and energy efficiency. However, price volatility may increase investment risks and if not mitigated, discourage investment.

## The government's strategic approach

The government's approach to getting the most out of our energy potential is to ensure energy markets are effective and efficient. In doing this, the government's role is to get market incentives and the regulatory framework right, and to ensure we get the most out of our resources.

The government has already made significant strides in following this strategy. 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.

Getting the most out of our resources involves both enabling investors to optimise the development of resources and ensuring resources are used efficiently to get the most value from them. The government's role in both industry development and in energy efficiency is to provide incentives, 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 develop resources in an environmentally appropriate 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.

## Strong environment, strong economy

New Zealand's natural resource base underpins our economy. Without protecting our environment and managing it carefully for the long term, our economy will not reach its potential.

Likewise, with a strong economy New Zealand can afford to look after our environment. A strong economy allows the government to spend money on biodiversity, on improving water quality, on protecting our endangered species and preserving our heritage.

Developing both mineral fuel and renewable resources, where appropriate, will help us to build both a strong and more resilient economy and a strong environment. Of course, the resources must be developed in an environmentally responsible way.

This strategy points towards a longer term future where energy resources emitting low or no greenhouse gas emissions will come to the fore.

The environment and economy are also both supported by the government's commitment to continually improve energy efficient design, awareness, and practice.



The map is indicative only. Not all types of resources are represented nor are resources represented in all areas where they occur.

# Our future

This section describes where we are now, and what New Zealand could look like in a desirable energy future. It shows that we expect our energy future will be different from the present. We can't know exactly what the future will hold, particularly as major technology changes may occur, but we can set out how we would like the future to be.

## Now...

The Taranaki region has yielded oil and gas for decades, shaping our energy mix and significantly contributing to New Zealand's economy. Most of New Zealand's territory is yet to be explored and the potential for further development of petroleum resources is significant.

New Zealand has drawn on geothermal energy for power for 50 years and forestry wastes have been used for decades for industrial heat. Yet New Zealand's biological and geothermal resources are identified as having considerably greater potential to provide energy in various forms and contribute to the economy and energy security.

We source about 70 percent of our electricity from renewable sources, particularly from hydro, geothermal and a small but growing proportion from wind.

New Zealand is a member of international research partnerships seeking to develop new energy-efficient technologies and to harness low emissions energy.

We derive around half of our total energy needs from imported oil, which is mostly used for transport. Agricultural exports and tourism are dependent on fossil fuels. Internationally there is a rapidly increasing consumer awareness of the carbon footprint of products and services.

## A desirable long-term future...

New Zealand's major petroleum basins have been surveyed and areas with potential have been explored, developed and fully utilised. Significant discoveries of oil and gas resources have boosted New Zealand's foreign earnings and domestic gas supplies.

Landowners, including Māori, have chosen to profitably and sustainably harness energy from their geothermal and forestry resources. Where economic, farms and rural processing companies use agricultural, forestry and landfill energy resources to produce heat, biofuels and electricity for on-site or local use. With diverse supply options, rural communities are much more resilient to external energy price changes and disruptions.

New Zealand has a secure electricity system dominated by renewable or low emissions sources. Hydro, geothermal and wind play key roles. Distributed generation and new sources, such as marine energy, result in a more robust system. Technology advances enable demand-side responses to assist consumers to manage their energy costs and to support energy security.

New Zealand has proven itself to be a smart niche player in new energy technologies both through international partnerships and the development of local companies. New Zealand quickly adopts innovative energy efficient and low emissions technologies.

Oil is used efficiently and where it is most highly valued. Oil for transport is substituted to some extent by low emissions alternatives, such as electricity and biofuels. Innovation in energy management has been crucial in improving energy efficiency and lowering the carbon footprint of New Zealand's agricultural and tourism industries.



## Now... continued

New Zealand's electricity grid provides a high level of supply security, but aged equipment has raised concerns that supply interruptions might become more frequent.

Electricity prices for households have risen significantly over the last ten years. In 2009, the performance and governance of the electricity market was reviewed and changes are underway.

Many of our homes are cold and damp and are inadequately heated, contributing to health problems, days off work and school, hospitalisations and premature death. People are encouraged to replace polluting fireplaces and old wood burners with clean heaters to reduce air pollution.

New Zealanders have become more aware of the value of being more energy efficient. Many products are progressively becoming more energy efficient. There is still much more we can do to improve our energy efficiency in transport, business and at home.

In cities, cars sit in congested traffic, wasting fuel. Public transport is not a convenient alternative for many people. In rural areas, people are heavily dependent on their cars for accessing services.

Emissions from energy activities increased significantly between 1990 and 2005, only stabilising more recently due to high oil prices in 2008 and then to the recession.

## A desirable long-term future... continued

New Zealanders are confident that the robust, reliable and efficiently run electricity grid meets their electricity needs.

A stable, competitive, efficiently regulated and innovative market provides a reliable service at a level that remains affordable to consumers.

All New Zealanders live in homes that are warm and dry, and heated efficiently with clean sources of energy. Home owners choose building designs which take advantage of the sun's warmth and which incorporate efficient, clean technologies for water and space heating and to produce power. The costs of home-scale heating and distributed generation technologies have reduced to a level that is commonly affordable.

Continuous improvements in energy efficiency have significantly reduced the amount of energy required to contribute to creating a unit of gross domestic product (GDP), and New Zealand's economy continues to grow more strongly. There is continual research, development and uptake of new, more efficient technologies and practices. Business productivity has improved.

Transport networks and vehicles are highly energy efficient. A robust road and public transport infrastructure and widely available high-speed internet capability enables New Zealanders to access family and social networks, work, recreational and social services in a variety of ways efficiently and affordably.

Energy-related greenhouse gas emissions have significantly reduced, contributing to New Zealand meeting its economy-wide targets and international commitments. Emissions from transport have halved due to improvements to efficiency and greater use of lower carbon energy sources.



# The strategy

## 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.

## We all influence our energy future

The actions of all New Zealanders as well as the government will enable New Zealand to realise the direction set by this strategy. This is particularly the case because the strategy relies strongly on effective energy markets to deliver the goal, which means the actions of investors, industries and individuals to make smart energy choices count.

The government acknowledges that Māori, as Treaty partners, wish to have a greater role in management and decision-making over natural resources, including energy resources. This kind of role is being acknowledged through Treaty settlements and other processes. The government also acknowledges Māori have interests in developing the resources they own, and in safeguarding environmental sustainability.

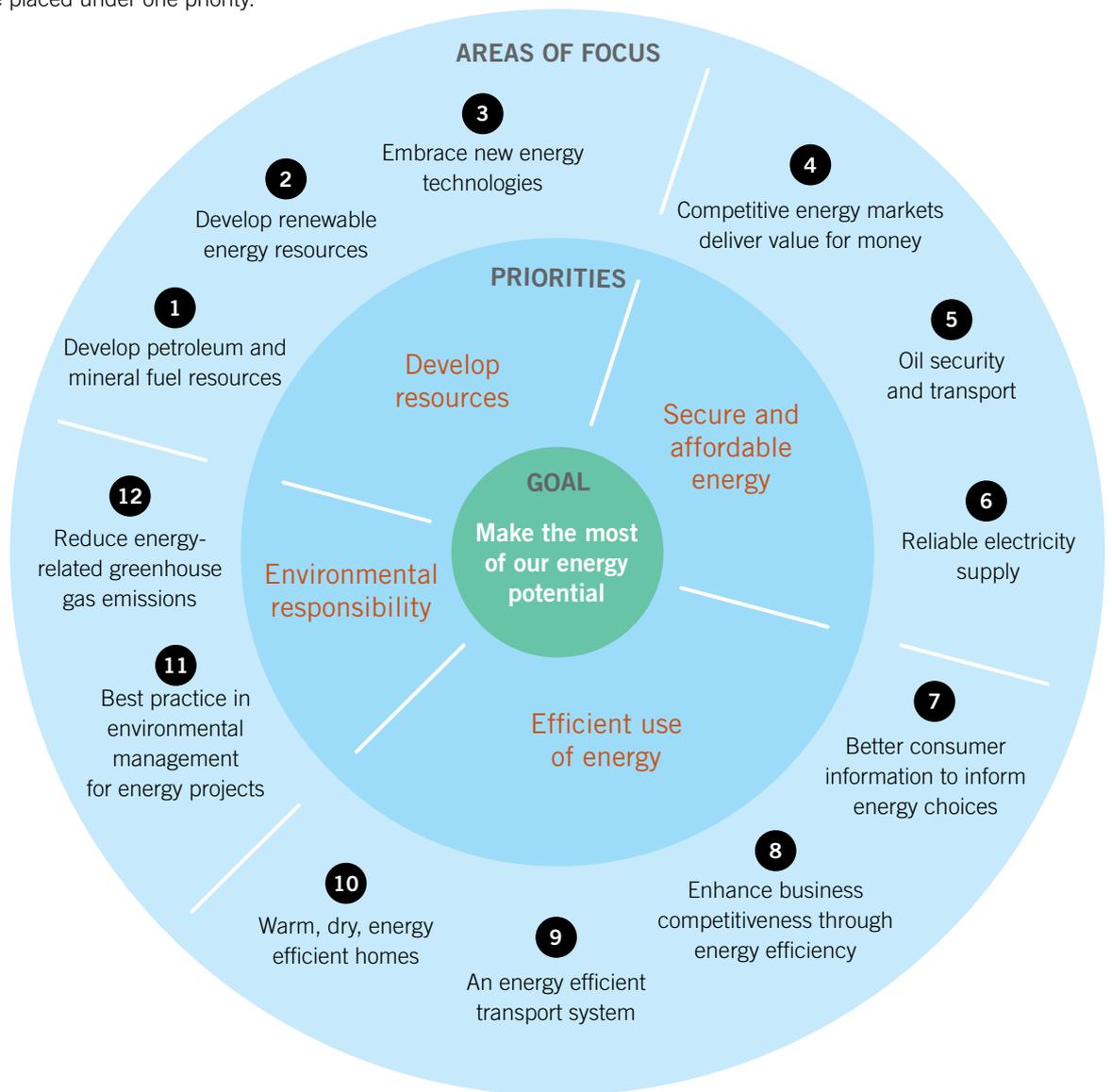
For energy sector participants the strategy provides an overview of the government's priorities and sets the direction for energy development and management. Many specific or detailed issues raised in the submissions have been noted by relevant officials and will inform their work.

The economic well-being of many sectors is affected by energy costs and availability, energy developments 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. The desirable long-term future described in this strategy is affected by everyone's energy choices.

## Strategy structure

This strategy retains the four priorities and twelve areas of focus proposed in the draft strategy. These are intended to support New Zealand to make the most of its energy potential.

The structure of the strategy is outlined in the following diagram. Note that some areas of focus relate to more than one priority, but for convenience are placed under one priority.



## Balancing risks, constraints and opportunities

There are inherent tensions and trade-offs in delivering energy policy. Energy security, prices, the environment, and development of energy resources all have a relationship with each other, as well as each contributing to the overall goal. The government must balance these tensions.

Moving to a lower carbon economy in the longer term presents both challenges and opportunities for New Zealand's continued economic growth.

# Priority: Develop resources

## Areas of focus

- 1 Develop petroleum and mineral fuel resources
- 2 Develop renewable energy resources
- 3 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.

For simplicity, the first area of focus covers petroleum and mineral fuels (all non-renewable resources) and the second covers renewable energy resources. The third is about research and development of all types of energy resources.

### 1 Develop petroleum and mineral fuel resources

The country already benefits substantially from the revenue gathered from the development and sale of petroleum and coal resources, and both are significant export earners.

Oil exports contribute considerably to New Zealand's international trade balance, while gas production makes an important economic contribution as a low cost source of energy. Exploration and production activity draws large amounts of investment capital and sophisticated technology into the country and provides high wage, high skill job opportunities for New Zealanders.

Further commercialisation of petroleum and mineral fuel resources has the potential to produce a step change in economic growth for the country.

The government's strategic objective for petroleum is to ensure New Zealand is a highly attractive global destination for petroleum exploration and production investment, such that we are able to develop the full potential of our petroleum resources.

The immediate focus is on increasing exploration activity and on improving the knowledge of our petroleum basins.

The government's Petroleum Action Plan focuses work from 2010 and beyond.<sup>2</sup> The action plan includes:

- 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.

A pathway will also be developed to realise the potential of New Zealand's gas hydrates endowment.

The government will ensure regulatory settings maximise the return to New Zealanders and require environmentally responsible practices. The government is committed to ensuring all petroleum exploration and production activities have rigorous environmental and safety controls to manage risks and to minimise effects on the environment.

New Zealand's extensive coal resources currently contribute to electricity supply security. Coal is also utilised by industry and is exported. Coal could potentially contribute to the economy in other ways, such as through the production of liquid fossil fuels, methanol or fertiliser such as urea.

This potential is unlikely to be fully realised unless an economic way to manage the resulting high levels of greenhouse gas emissions is found.

<sup>2</sup> See [www.med.govt.nz/petroleum-action-plan](http://www.med.govt.nz/petroleum-action-plan)

## 2 Develop renewable energy resources

New Zealand benefits substantially from use of its abundant renewable energy resources. New Zealand's well established hydro, geothermal and wind electricity generation contribute significantly to energy supply. In 2009 and 2010, more than 70 percent of our electricity was from hydro, geothermal and wind resources. There are also some outstanding examples of wood and geothermal energy being used for large-scale industrial heating, and many smaller scale applications.

These developments are directed by investments made in a competitive market. The government welcomes and expects to see considerably more investment in renewable electricity generation, particularly from geothermal and wind resources. To support this, the government will continue to ensure market incentives and the resource management framework supports further investment in appropriate new projects. The government will continue to articulate the national benefits of renewable energy in its resource management reform and to remove any unnecessary regulatory barriers.

There are good reasons to develop a mix of renewable energy resources, large and small. Developing a diversity of energy resources within New Zealand will significantly contribute to boosting energy security, creating jobs, and increasing the availability of energy to assist economic growth in other sectors.

New Zealand is likely to improve its resilience to disruptions in energy supply through utilising a wider range of energy resources.

Additionally, a proportionally greater use of renewable resources will help to improve air quality and health, reduce energy-related greenhouse gas emissions, and meet the renewable electricity target.

New Zealand enjoys a range of emerging renewable energy resources with good future potential for electricity, fuel and direct heat production. Some have niche applications. Others have the potential to provide significant future energy and economic returns. However, developers of these resources face additional challenges, stemming from immature markets, low consumer awareness, emergent technology, uncertain environmental effects, and lack of supporting infrastructure. Some technologies are simply not yet commercially viable.

Government actions will include:

- Continuing to develop and implement policies to encourage investment in renewable energy resources, focusing greatest attention on areas where there are particular barriers to investment that government can overcome, and where economic returns are most likely.
- Encouraging biomass-to-energy development. This will include working with industry to support its bioenergy strategy, encouraging industry and market development for viable proven technologies with as yet low uptake, and positioning New Zealand to take advantage of new emerging technologies.
- Investigating ways to support the development of new applications using geothermal energy, improve access to geothermal information and improve geothermal consenting processes.
- Continuing to work with industry associations and councils to identify and remove unnecessary barriers to the uptake of renewable energy technologies. These include those utilising wood, agricultural and landfill residues, solar photovoltaics, solar water heating, air and ground source heat-pumps, and community and smaller scale wind and hydro generation.
- Encouraging the emerging marine energy industry as appropriate, including in its bid to build New Zealand as a test bed for marine energy technologies.

### Renewable target for electricity generation

The government retains the aspirational, but achievable, 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 more than 70 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. In the next decade the government expects to see more geothermal and wind generation in particular.

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.

### 3 Embrace new energy technologies

The government will facilitate the swift uptake of new energy technologies within New Zealand, and support the deployment of New Zealand energy technologies at home and overseas.

The government will consider how best it can facilitate development of new energy technologies including renewables, as part of encouraging innovation in industry.

Considerable effort into research and development of new energy technologies is taking place around the world. Successful technologies will emerge that we don't know about yet. No one can pick which new technologies will be the 'winners'. In the face of this uncertainty, it is important to keep an open mind and not to close off options. Although a small player, New Zealand has niche areas of expertise and a rich resource base. Deployment of new energy technologies offers significant potential for wealth creation, both in the immediate term and longer term.

New Zealand will keep abreast of international developments and innovations. 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, geothermal, petroleum, 'smart' electricity network technologies, energy efficiency (at all levels of supply, infrastructure and demand), and marine energy.

Internationally, the development of carbon capture and storage (CCS) is recognised as a potential technology for carbon dioxide (CO<sub>2</sub>) reduction from a range of energy resources such as gas, oil, geothermal and biomass production, or conversion of coal to liquids.

CCS is at an early stage of development. International initiatives aim to deploy integrated CCS projects at commercial scale by 2020. Given New Zealand's fossil fuel endowment, the government will continue to participate in international CCS research forums and continue to keep abreast of technological, regulatory and legislative developments in this area. The government will develop a legislative framework to manage the technology when required.

The government anticipates the uptake of technologies that provide for storage of energy, such as the aggregated use of electric vehicle battery storage, fuel cells and enhanced thermal storage in commercial buildings, where opportunities are found to be commercially viable.

To gain best value from emerging energy research opportunities, cooperative relationships between government, industry and the research sector are vital and the government will foster these connections.

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.

#### Potential to expand uses of geothermal and bioenergy

There is significant commercial potential in geothermal energy in the near future. In addition to electricity generation, there are already commercially available technologies using stable ground temperatures to boost heating and cooling for buildings or industrial uses (for example, ground source heat pumps). Other emerging technologies aim to access deep geothermal resources and to expand the use of geothermal energy for direct heat applications.

There are also considerable opportunities to create energy from a range of biomass resources. Biological resources can be used to create electricity, combined heat and power, liquid fuels and biogas. Biomass resources are already used to create energy from wood residues, sewage ponds and other effluent sources. The use of biomass resources, whether they be residues or purpose-grown, and at all scales of development, is encouraged where it is economically viable. In many cases biological resources suit smaller scale or on-site use.

Some land owners are identifying opportunities to add value to their forestry and crop resources by producing energy. Reliable supplies of biomass can be used for large-scale operations such as biomass for industrial heating, or biofuel production through 'second' or 'third' generation technologies, or large combined heat and power systems.

# Priority: Secure and affordable energy

## Areas of focus

- 4 Competitive energy markets deliver value for money
- 5 Oil security and transport
- 6 Reliable electricity supply

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.

## 4 Competitive energy markets deliver value for money

'Value for money' is achieved when prices are set at a level that reflects the cost of supply, including environmental costs and long-run capital costs. They reflect the least cost provision of energy services at a level of quality demanded by consumers.

Value for money is best delivered by competitive markets. When it is considered that a market is failing to deliver value for money, the government will consider whether and how it could act to address the cause. For example, concern over increasing electricity prices was a major reason for the 2009 Ministerial Review of Electricity Market Performance.

This section now addresses each of the electricity, gas and oil markets in turn.

### 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 efficient and flexible use of energy across society also contributes to system security.

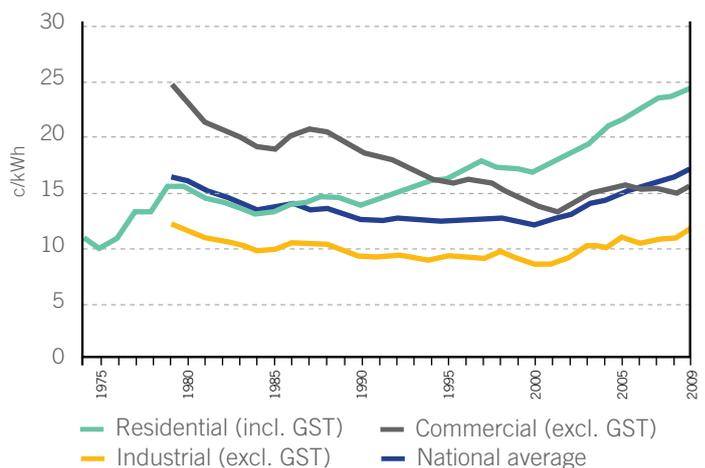
Energy systems must have the resilience to cope with shocks and change, for example, from natural disasters or international events. Obtaining energy from a diversity of sources, rather than being reliant on a few dominant sources, enhances energy security and resilience to shocks.

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.

## Competitive electricity market

In 2009 and 2010, the review of the electricity market resulted in significant electricity market reforms. These changes were driven by a concern over the significant price increases, particularly for residential electricity, experienced by consumers over the past 10 years. The graph below shows the cost of electricity paid by various sectors in real terms from 1974 to 2009 using 2009 dollars.

### Rising household electricity prices over time (Real 2009)<sup>3</sup>



The government was also concerned that the governance arrangements were not effective in developing market rules in a timely manner to drive competition and efficiency in the industry.

With the passing of the Electricity Industry Act in October 2010 and the establishment of the Electricity Authority, replacing the Electricity Commission, many of these fundamental reforms have been put in place. The Electricity Authority is responsible for promoting competition, reliable supply and efficient operation of the New Zealand electricity market.

<sup>3</sup> New Zealand Energy Data File. Ministry of Economic Development; 2010; p 135.

The government will continue to implement the reforms over the next year or so, including replacing the winter security arrangements provided by the diesel-fired Whirinaki plant with incentives on market participants to ensure sufficient peak supply is developed and managed by the market.

The reforms enable consumers to change their electricity supplier more quickly, helping them to save money. The review found that residential customers could save on average about \$100 a year – or \$150 million a year across all customers – by switching to the cheapest available retailer. Electricity retailers must now switch customers within 10 working days of being asked, and half of all switches must occur within five working days – much faster than the 23 days allowed previously. The government has also established a three-year \$15 million fund to promote customer switching.

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. All gas and electricity retailers and distributors and Transpower must comply with the rules of the scheme and with any binding settlements determined by the Commission in response to a consumer complaint.<sup>4</sup>

The government remains committed to ensuring the electricity market operates competitively, responsively and responsibly for the long-term benefit of all New Zealand electricity consumers. The government will watch closely to see the changes achieve the desired result.

The government will also closely monitor the impact of new technologies on the security and affordability of electricity supply.

### 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 delivers fair and efficient gas prices. The Gas Industry Company has the responsibility of addressing competition issues relating to infrastructure.

Gas has been a major energy source in New Zealand for more than 30 years. New Zealand has transitioned from one major gas field to multiple gas fields.

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.

Gas is an important feedstock for electricity generation. Gas is also an important direct source of energy in industry and homes, either reticulated or as LPG. The direct use of gas by end consumers can offer consumer and national benefits, particularly when used for large industrial purposes or for water heating.

Discovery of more gas in New Zealand will support electricity supply security. New Zealand's geological basins are largely unexplored and there is a distinct possibility of significant oil and/or gas being found in the future. The effect of future gas or oil finds on New Zealand energy security is difficult to forecast and will depend on the size of the discoveries and their location. Small discoveries may sustain supplies to current users. Very large finds may prompt export initiatives which would have economic development benefits and could have the side effect of more closely tying New Zealand to international gas price movements, depending on the location of the finds.

### Overseeing oil markets

Petrol, diesel and LPG 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.<sup>5</sup>

### Energy affordability and vulnerable consumers

Every household in New Zealand should be able to heat and light their home adequately, but even the most competitive prices may present difficulties for some households.

Government agencies have an ongoing commitment to monitor issues around household energy affordability.

Assistance is available to households to address home insulation and heating problems through the Warm Up New Zealand: Heat Smart programme. Greater assistance is available to those in lower income homes.

The Electricity and Gas Complaints Commission has the power to resolve all consumer complaints, and consumers can switch more easily and quickly to cheaper suppliers with the assistance of Consumer NZ's Powerswitch website.<sup>6</sup>

The government will ensure the electricity sector continues to safeguard vulnerable consumers so that they do not have their electricity disconnected without due warnings.

<sup>4</sup> See [www.egcomplaints.co.nz](http://www.egcomplaints.co.nz) for more information.

<sup>5</sup> See [www.med.govt.nz/oil/monitor](http://www.med.govt.nz/oil/monitor)

<sup>6</sup> See [www.powerswitch.co.nz](http://www.powerswitch.co.nz)

## 5 Oil security and transport

As a small, geographically isolated and open economy, New Zealand is vulnerable to increases in oil prices and external disruptions to oil supply. We rely on imported oil for around half our total energy needs, including almost all our transport needs.<sup>7</sup> Oil and gas are also critical feedstocks for industry and agriculture (for example, gas is used to make fertilisers).

New Zealand will continue to rely on oil for decades to come. Discovery of more oil within our territory, or production of alternative liquid fuels could help reduce our exposure to international oil supply disruptions and have a positive impact on our balance of payments.

Even with local discovery or production of liquid fuels, the price to New Zealanders will remain in line with international oil prices. We anticipate that oil prices will continue to be volatile yet on an upward path over the coming decades. The upward price path (especially price spikes) is expected to help to stimulate the use of alternative energy sources whose prices are not impacted by the oil market, although we acknowledge price volatility (repeated ups and downs) can create more investor risk and discourage investment. Such alternatives include electric vehicle technologies and fuel cells.

Diversifying transport energy sources will help New Zealand's energy security and resilience. The government will not pick winners. Ultimately, uptake of new energy sources and technologies will depend on the decisions made by investors and consumers as they respond to oil prices.

The government will keep a close eye on market developments of fuels that can add diversity to New Zealand's fuel mix over time. The government will act to stimulate new market developments or remove barriers to new technology uptake where appropriate.

Improving transport energy efficiency also helps reduce transport costs and exposure to high oil prices. The government will continue its support of public transport, walking and cycling initiatives and will consider cost effective options to reduce the rate of fuel consumption of the New Zealand vehicle fleet.

Maintaining the competitiveness of air transport is of strategic importance to the New Zealand economy. Critical to this competitiveness is the long-term development and deployment of sustainable alternative aviation fuels. The government will continue to facilitate the aviation sector's active efforts to increase the energy efficiency of the aviation industry and diversify its fuel mix.

New Zealand maintains 90-day oil reserves, to respond to serious international oil supply disruptions, as part of its obligations to the International Energy Agency. The government has an Oil Emergency Response Strategy in place in the event of a disruption to oil supply.

<sup>7</sup> *New Zealand Energy Data File*. Ministry of Economic Development, 2010; p 12.



A seismic vessel ploughing through New Zealand waters. The government has spent more than \$20 million on seismic acquisition over offshore basins since 2008.

### 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](http://www.energysafety.govt.nz).

## 6 Reliable electricity supply

Long-term security and reliability of electricity supply requires long-term regulatory certainty and effective and balanced rules, so that:

- Enough generation capacity is built to meet peak demands.
- Consumers can contribute to electricity security through their demand management actions and by investing in on-site generation.
- There is enough fuel from a diversity of sources (taking into account the uncertainty of hydro inflows and wind flows) to generate sufficient electricity at all times.
- The transmission and distribution system reliably conveys power from generation plants to consumers, particularly at times of peak demand.
- The system is run efficiently with minimal losses.

Ongoing investment in generation, transmission, distribution and in demand management technology is necessary to provide New Zealand with a robust electricity system capable of providing an acceptable standard of reliability and security.

Reliable electricity supply requires ongoing investment in good infrastructure. As noted elsewhere in this document, the government will continue to focus its attention on resource management issues that inappropriately adversely affect investment in electricity infrastructure.

It is noted that security of gas supply relates to electricity supply security and that the two markets are interdependent.

The government's major electricity market review in 2009 resulted in a broad suite of proposals to increase security of supply.

As a result, new measures to promote secure electricity supply have been included in the Electricity Industry Act 2010. These measures include phasing out the reserve energy scheme and ensuring that market participants have clear incentives to manage risk, such as by putting a floor on spot prices and by requiring companies to compensate consumers during conservation campaigns. The government will also incentivise gas exploration and development, improve the quality of information on gas reserves and identify barriers to geothermal energy development.

Details are available at [www.med.govt.nz/electricity](http://www.med.govt.nz/electricity).



Completed in May 2010, the 140MW **Nga Awa Purua Geothermal Power Station** houses the largest single shaft geothermal turbine in the world. Nga Awa Purua is one of several joint ventures between electricity generator Mighty River Power and the Tauhara North No. 2 Trust.

# Priority: Efficient use of energy

## Areas of focus

- 7 Better consumer information to inform energy choices
- 8 Enhance business competitiveness through energy efficiency
- 9 An energy efficient transport system
- 10 Warm, dry, energy efficient homes

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. If the economy's energy and emissions intensity levels trend downward more quickly than our competitors, our productivity will improve and the economy will benefit.

Further detail on government policies for energy efficiency is provided in the New Zealand Energy Efficiency and Conservation Strategy later in this document.

## 7 Better consumer information to inform energy choices

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

- Reporting price margins for petrol, diesel and LPG.
- Reporting quarterly domestic electricity prices.
- Reporting bi-annual domestic gas prices.
- Funding, upgrading and promoting [www.powerswitch.co.nz](http://www.powerswitch.co.nz) to provide electricity consumers with price comparisons between retailers.
- Providing energy-efficiency labelling and standards for electrical appliances, in association with Australia.
- 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.

### 'Smart' technologies

Better information can assist consumers to identify areas of energy wastage and save money by making changes.

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.



## 8 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 industry development and use of voluntary 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.

### Improving energy efficiency

Across all sectors and energy resources, there is potential for improving energy efficiency and energy conservation.

An improvement in energy efficiency can be defined as getting more benefit from using the same amount of energy, such as when a more fuel-efficient vehicle uses six litres per 100 kilometres rather than 10 litres per 100 kilometres. Conserving energy means not using energy when we don't need it, such as turning lights off when we leave a room.

Energy efficiency improvements support achievement of all the goals in this strategy. Making energy savings as individuals we save money and reduce greenhouse gas emissions. Making energy savings across the economy also enhances energy security, defers the need for investment in new energy developments, and provides other benefits such as improved health and air quality to people and communities.

The government encourages business and household consumers to invest in appropriate energy efficiency measures.

While making energy efficiency improvements can be cost-effective, often households and businesses fail to see the opportunities, have insufficient information to know what changes to make, or lack incentives to make changes.

The government will address significant market barriers to energy efficiency. It will primarily do so by providing better information and incentives. It will also set product standards that enable continuing improvements while providing for consumer choice.

The government will also continue to gather information on energy use to inform its design of effective energy efficiency measures.

## 9 An energy efficient transport system

New Zealand's per capita energy use for transport is high relative to many other OECD countries. Our low population density, geography, a large volume of primary products freight, relatively low transport mode efficiency, and low vehicle fuel efficiency are contributing factors.

Improving transport energy efficiency offers major opportunities to improve the productivity of the overall economy. Oil constitutes half of the country's energy use, and most of that is consumed for transport. government measures involving incentives, information and partnerships to accelerate improvements in fuel economy will help keep our productivity levels in line with other economies.

The government will focus on improving vehicle fuel efficiency, promoting efficient fleet management for commercial fleets. It will also work toward improved modal choice in urban areas so people use public transport, walking and cycling more, thereby reducing their energy use.

The government expects local authorities, through their transport and urban planning roles, to improve the efficiency of transport networks and layouts of urban areas so people and freight can move about more easily and more energy efficiently.

The government also encourages the uptake of more efficient vehicles and low-carbon fuels and technologies, and efficiency measures in freight and in aviation.

## 10 Warm, dry, energy efficient homes

Around two thirds of New Zealand homes are poorly insulated or not insulated at all. These homes can be costly to heat and can lead to health problems for the occupants.

The government is committed to improving home insulation and clean heating levels in existing homes. The government has recognised there are barriers to home owners making energy efficient investments by themselves, and has committed to a large incentives 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 home owners 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 188,000 homes, including providing higher levels of support for at least 70,000 lower income homes. In the first year, more than 57,000 homes were insulated.



# Priority: Environmental responsibility

## Areas of focus

- 11 Best practice in environmental management for energy projects
- 12 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, and by responsible environmental management.

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.

Over time, sourcing an increased proportion of New Zealand's energy from low-emissions renewable energy will assist us to reduce our greenhouse gas emissions.

### 11 Best practice 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.

'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.

The government has embarked on a major programme to review and improve the administration of the RMA. The review will benefit New Zealand in that:

- Resource consents for projects of national significance will be considered in a timely manner by a newly established Environmental Protection Authority.
- Resource consents and planning processes will be streamlined to reduce unnecessary cost and delays whilst maintaining appropriate opportunity for public participation.

Further consideration will be given to facilitating infrastructure development under phase 2 of the RMA review.

A National Policy Statement on Renewable Electricity Generation will assist RMA decision makers weigh up the benefits of renewable generation with local environmental effects.

The environmental effects of smaller scale energy developments including distributed generation will be clarified, so that local authorities and industry bodies can enable acceptable smaller scale projects to go ahead without undue delay and administrative cost.

In recognition of concern over marine oil spills, the government has reviewed its environmental and safety regime. It is committed to ensuring all petroleum activities have rigorous environmental and safety controls.

#### 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. Aside from the release of greenhouse gas emissions, these include:

- Emissions (for example, particulates) from diesel and petrol combustion that affect human health.
- The release of particulates from the burning of wood, coal, waste oils and other products, especially for home heating, which affect human health.

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 has initiated a new process to improve New Zealand's fresh water management. The importance of hydro electricity generation to the country will be recognised in this process.



**Silver Fern Farms'** Finegand meat processing plant in Balclutha is turning sludge from waste water into a valuable biofuel, reducing the company's CO<sub>2</sub> emissions by 9,500 tonnes per year. The company aims for best practice in environmental stewardship and industry innovation.

### The role of local government

The decisions local authorities make in executing many of their core functions influence energy use in their local communities.

Councils are encouraged to identify and manage the effects on energy use of their decisions, particularly those relating to planning, transport and buildings.

For example, councils are encouraged to consider how their decisions under the Building Act 2004 and in administering the Building Code affect how easily building owners are able to install features such as solar hot water heating. Councils can encourage developers to improve the energy performance of new homes and buildings through good design.

Regional policy statements and regional and district plans, prepared under the RMA, will play a critical role in supporting the development of renewable energy resources and regional economic growth.

Integrated transport and urban planning and provisions in regional and district plans can help reduce urban energy use over the longer term. These decisions can also improve the choices available to people in moving themselves, goods and services around communities. Transport networks and urban areas that are designed to reduce energy use and travel time can save costs and increase productivity across the economy. Local government is expected to assist emissions reductions by providing better choices for public transport, walking and cycling in urban centres.

Local authorities are also encouraged to play a valuable leadership role in the promotion of energy efficiency and conservation and greater uptake of renewable energy and clean heating options.

## 12 Reduce energy-related greenhouse gas emissions

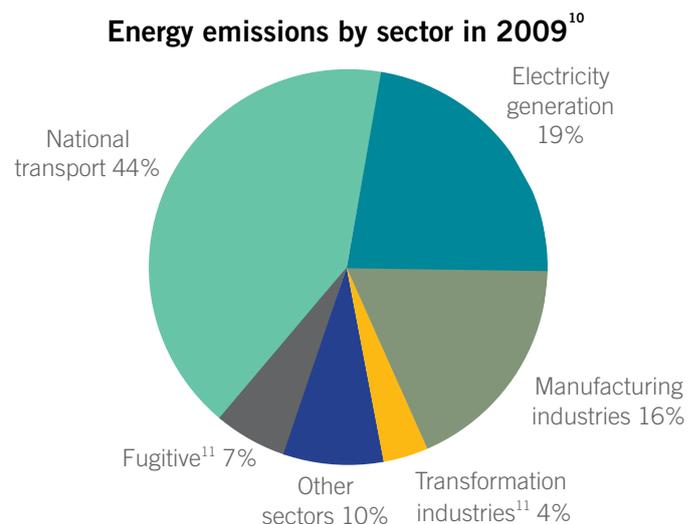
The government has adopted an economy-wide target for a 50 percent reduction in New Zealand's carbon-equivalent net emissions, compared to 1990 levels, by 2050.

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.<sup>8</sup>

### Energy-related greenhouse gas emissions

The supply and consumption of energy accounted for 45 percent of total New Zealand emissions in 2008.<sup>9</sup> Energy sector emissions have increased significantly since 1990. Electricity emissions have increased by 91 percent and transport emissions by 59 percent.<sup>10</sup>

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



<sup>8</sup> Details on government targets are available at [www.climatechange.govt.nz](http://www.climatechange.govt.nz)

<sup>9</sup> *New Zealand's Greenhouse Gas Inventory 1990-2008*, available at [www.mfe.govt.nz/publications/climate/greenhouse-gas-inventory-2010/index.html](http://www.mfe.govt.nz/publications/climate/greenhouse-gas-inventory-2010/index.html)

<sup>10</sup> *New Zealand Energy Greenhouse Gas Emissions*. Ministry of Economic Development; 2010; p 10.

<sup>11</sup> **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.



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 will be a feature of future investment decisions and in improving the competitiveness of low emissions alternatives.

The government's policies facilitating 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.

Delivery of the objectives and targets in the New Zealand Energy Efficiency and Conservation Strategy, outlined later in this document, is expected to contribute to reducing New Zealand's greenhouse gas emissions over the next five years.



In their best dress... Wellington's **Frocks on Bikes** group encourages people to cycle in the city.



## Implementing the strategy



All New Zealanders have a role to play in New Zealand achieving its energy goals.

The Ministry of Economic Development will oversee and coordinate the implementation of government actions to support the achievement of the New Zealand Energy Strategy.

As energy matters intersect with many other areas of policy, relevant government agencies involved in implementation include, but are not limited to, the: Ministry of Economic Development; Energy Efficiency and Conservation Authority; Electricity Authority; Ministry for the Environment; Ministry of Transport; Treasury; Ministry of Agriculture and Forestry; Ministry of Science and Innovation; Department of Building and Housing.

### Reporting

The Ministry of Economic Development will report annually to the Minister of Energy and Resources on progress on the New Zealand Energy Strategy.

### Review

The Minister of Energy and Resources will consider whether a review of the strategy is required after five years.



The New Zealand Energy Efficiency and Conservation Strategy (NZECS) 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 NZECS is prepared under the Energy Efficiency and Conservation Act 2000. The NZECS sets the government's policies, objectives, and targets for the next five years (to the end of 2015), and the means by which these will be achieved.



# New Zealand Energy Efficiency and Conservation Strategy

# 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 (NZECS) contributes to the delivery of government's energy priorities set out in the New Zealand Energy Strategy.

Feedback to the draft NZECS 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 for improved energy productivity. 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 energy productivity.

The NZECS 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 NZECS will vary according to the scale of energy productivity 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 \$000 GDP.<sup>12</sup>

**Energy productivity** is GDP per unit of energy – the inverse of energy intensity.

<sup>12</sup> 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 2015<sup>13</sup>

The NZEECS builds on achievements to date and focuses on five-year targets and objectives, to the end of 2015, to provide consistency and certainty for investment.

The government's energy efficiency target is for 55 petajoules (PJ) of saving across the economy by the end of 2015.

A 55 PJ energy saving:

- Equates to approximately a nine percent improvement (reduction) in economy-wide energy intensity by 2015.
- Increases New Zealand's rate of energy intensity improvement from one to 1.2 percent per annum (from 2008 levels).
- Equates to greenhouse gas emissions savings of approximately 4.2 million tonnes carbon dioxide equivalent (CO<sub>2</sub>-e) in 2015.

An improvement in New Zealand's energy use per unit of GDP of this order will more closely align New Zealand with the OECD average for energy intensity.

**The target of 55 PJ is ambitious.** It is based on projected advances in energy efficient technologies and the continuing development of new policy and programmes in addition to current programmes.

**The target is realistic.** If the recent rate of new policy development is continued, such as the Warm Up New Zealand: Heat Smart programme, we can expect to see such a change occur.

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.

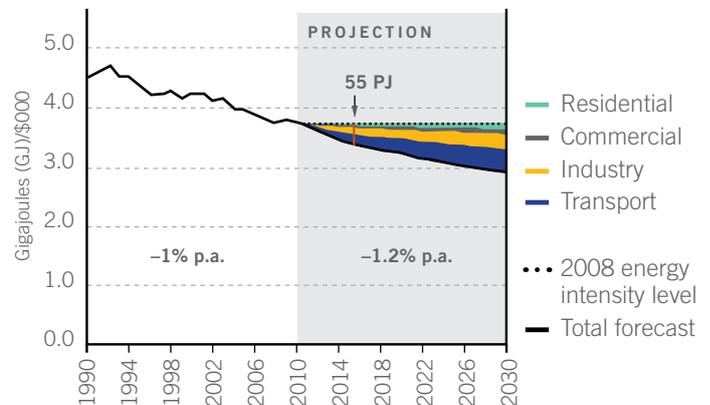
## Sector targets

The 55 PJ economy-wide target is shared between the transport, business and homes sectors. Significant energy savings are anticipated to come from improved product 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 targets are to 2015 from a baseline year of 2008 unless otherwise noted.

## New Zealand's energy intensity to 2030<sup>14</sup>



The revised target for additional use of heat and/or fuels from bioenergy and geothermal sources is based on *New Zealand's Energy Outlook 2010*<sup>15</sup> data. By 2025, we anticipate 17 PJ of additional heat or fuel from biomass and geothermal sources will be used annually.<sup>16</sup> This includes an additional 5 PJ being used in the year 2015 compared to 2010.

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.

## 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 draft 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 proposed 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.

<sup>13</sup> The economy-wide target and sub-targets are derived from the Ministry of Economic Development's modelling for *New Zealand's Energy Outlook 2009*. Note that these targets are derived from consumer energy use, excluding petrochemical production, whereas *New Zealand's Energy Outlook 2010* includes petrochemical production as consumer energy consumption.

<sup>14</sup> Ministry of Economic Development; Energy Information and Modelling Team; data sourced from modelling for *New Zealand's Energy Outlook 2009*.

<sup>15</sup> *New Zealand's Energy Outlook 2010*. Ministry of Economic Development; 2010. See [www.med.govt.nz/energyoutlook](http://www.med.govt.nz/energyoutlook)

<sup>16</sup> This target counts industrial use only; 16 PJ is anticipated to come from biomass direct use, and 1 PJ from geothermal energy. The 5 PJ to 2015 is solely from biomass.

## Sector objectives and targets

Targets are due by 2015 unless otherwise stated. The PJ energy savings targets equate to the difference between 2008 energy intensity levels and projected 2015 levels.

Objectives	Targets
<b>Transport</b> A more energy efficient transport system, with a greater diversity of fuels and alternative energy technologies.	29 PJ of savings. A four percent improvement from 2008 levels in GJ/kilometres travelled on land.
<b>Business</b> Enhanced business growth and competitiveness from energy productivity investment.	21 PJ of savings (16 PJ of savings in industry and five PJ in the commercial sector). 14 percent improvement in the commercial and industrial sector energy intensity level (GJ/\$1,000 of GDP). 17 PJ of additional heat or fuel from biomass and geothermal sources to be used annually by 2025 (compared to 2010). This includes an additional 5 PJ to be used in 2015.
<b>Homes</b> Warm, dry and energy efficient homes with improved air quality to avoid ill-health and lost productivity.	Four PJ of savings. Historical trends of increasing energy use by households levelling off.
<b>Products</b> Greater business and consumer uptake of energy efficient products.	Extend Minimum Energy Performance Standards, labelling and EnergyStar product coverage to remain in line with major trading partners.
<b>Electricity System</b> An efficient, renewable electricity system supporting New Zealand's global competitiveness.	90 percent of electricity will be generated by renewable sources by 2025, providing supply security is maintained.
<b>Public Sector</b> Greater value for money from the public sector through increased energy efficiency.	10 percent reduction in energy use per full time staff equivalent compared with 2008/09 baseline.

## Official records of programme details

Some submitters to the draft NZEECS requested full lists of government energy efficiency initiatives to be printed in the strategy. The NZEECS hasn't accommodated this. As a statutory document with a five year shelf 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.

Instead, 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](http://www.eeca.govt.nz) – all EECA programmes for householders, communities, business, government, local government.

[www.eecabusiness.govt.nz](http://www.eecabusiness.govt.nz) – energy advice and support targeted at businesses.

[www.energywise.govt.nz](http://www.energywise.govt.nz) – energy advice and support targeted at householders.

These website links are also helpful:

[www.rightlight.govt.nz](http://www.rightlight.govt.nz) – information about efficient lighting.

[www.transport.govt.nz/ourwork/climatechange](http://www.transport.govt.nz/ourwork/climatechange) – Ministry of Transport information and initiatives relating to climate change and energy.

[www.safednz.govt.nz](http://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](http://www.rightcar.govt.nz) – information on how vehicles rate for fuel economy, safety, CO<sub>2</sub> emissions and pollutants.

[www.fuelsaver.govt.nz](http://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.

## Targets

By 2015: 29 petajoules (PJ) of savings.<sup>17</sup>

By 2015: A four percent improvement from 2008 levels in GJ/kilometres travelled on land.

## 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.

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

The relatively poor fuel economy of the New Zealand transport fleet is an important energy challenge facing the economy. Projected rates of improvement in the efficiency of the light 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.

More efficient use and greater use of alternative transport fuels can reduce our exposure to oil prices.

## 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 productivity gains in the transport sector. No one policy can make the most of the transport sector's energy productivity potential.

Quality local roads and public transport services are essential to maximise the efficiency of the transport network. Greater use of

public transport reduces 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.
- Promote efficient business fleet management through provision of information and audit programmes, such as professional driver training under the Safe and Fuel Efficient Driving (SAFED) New Zealand 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 fuels and energy efficient measures, as air transport is strategically important to New Zealand industry.

<sup>17</sup> The PJ energy savings target equates to the difference between 2008 energy intensity levels and projected 2015 levels.

# Business

## Objective

Enhanced business growth and competitiveness from energy productivity investment.

## Targets

By 2015: 21 petajoules (PJ) savings (16 PJ industry; five PJ commercial).

By 2015: 14 percent improvement in the commercial and industrial sector energy intensity level (GJ/\$1000 of GDP).

By 2025: 17 PJ of additional heat or fuel from biomass and geothermal sources to be used annually (compared to 2010). This includes an additional five PJ to be used in 2015.

## 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 maximising their energy productivity, 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 energy productivity 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 efficient 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 objectives 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 productivity good practice is reflected in mainstream business planning.
- Encourage major firms proficient in energy productivity 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 through 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.

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.

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.



**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.

## Commercial buildings

In the commercial building sector, the government will boost existing market trends towards the development of energy efficient 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.

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## Targets

By 2015: Four petajoules (PJ) of savings.

By 2015: Historical trends of increasing energy use by households levelling off.

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## 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.

There has been a market trend to build newer homes to be bigger and better heated. This has contributed towards a reported 10 percent growth in energy demand from the residential sector since 2001.<sup>18</sup>

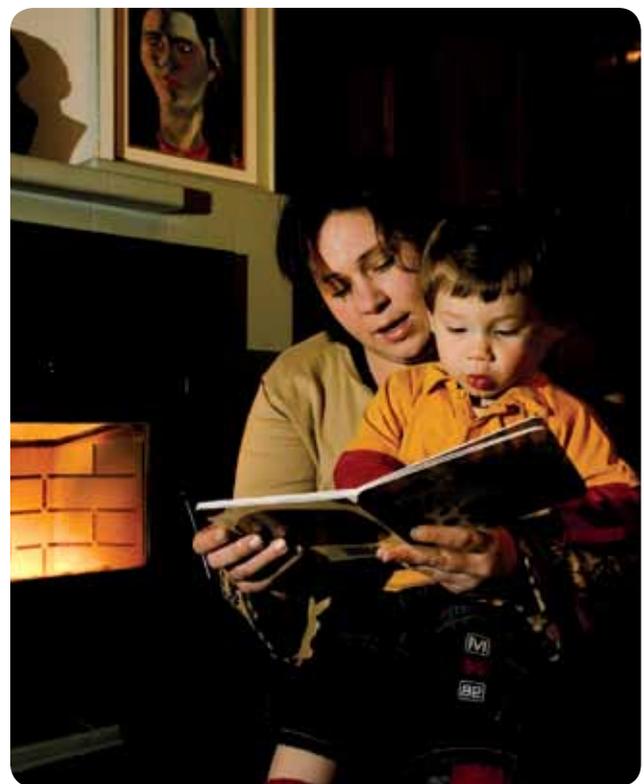
Householders often want to make improvements but lack access to capital and credible information to make informed energy efficiency investment decisions.

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.



<sup>18</sup> Energy Efficiency and Renewable Energy in New Zealand Year Six Report. Energy and Conservation Authority, March 2010.

## 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 2015 the government expects to have supported the insulation and clean heating of more than 188,000 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 productivity 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. This includes promoting the greater use of renewable sources of energy in the home, such as clean wood burners and solar hot water heating systems.

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

**[www.homestar.org.nz](http://www.homestar.org.nz)** – find out how well your home performs with a simple online assessment.

**[www.smarterhomes.co.nz](http://www.smarterhomes.co.nz)** – helps create healthier, affordable homes for better living with advice on buying, renovating and designing homes.

**[www.consumerbuild.org.nz](http://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<sup>19</sup>

By 2015: 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 sector-specific actions outlined in previous sections 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.



<sup>19</sup> There are significant energy savings from products programmes. However, this target is not expressed as the petajoules (PJ) saved as this would be double-counting. The PJ savings from products contribute to the achievement of the business and residential sectors targets and have been included in the combined economy-wide target. Instead, the products target is expressed as the output the government will achieve.

# 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

Some 70 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 and '100% Pure' New Zealand brand.

New Zealand is targeting 90 percent of electricity generation to be from renewable sources by 2025, providing electricity supply is secure. This target is aspirational but achievable, 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 is 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 comes at a cost, including their environmental impact.

Electricity efficiency and demand side management measures should be implemented where they provide a more cost effective option than the long run marginal cost of new electricity supply.

## 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 standalone 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 creating a 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 2015: 10 percent reduction in energy use per full-time staff equivalent compared with a 2008/09 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 productivity 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 target, while relevant to many organisations, will not be applicable to all. It is to be regarded as indicative of the level of ambition the government seeks. Where it is not directly applicable, agencies are encouraged to adopt comparable targets or indicators to track energy performance, in line with the objective of this section.

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 productivity 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.

Focusing on high energy users, the government will identify and address areas of greatest potential for energy productivity gains within the wider public sector, including the use of renewable energy where appropriate.

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 the enforcement of building, resource management, and transport laws.

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. To this end the government will continue to support local government to maximise energy productivity gains in their regions.

# Governance

## Delivery

The New Zealand Energy Efficiency and Conservation Strategy (NZECS) 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 NZECS's delivery across portfolios.

The lead and support agencies identified in the NZECS will be required to develop appropriate policy measures that contribute to the realisation of the NZECS'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 give regard to the following key questions:

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

## Monitoring progress and review

The Ministry of Economic Development, with cooperation from the Senior Energy Officials Group, will monitor progress towards the NZECS's targets and objectives. Officials will provide an annual report on progress to the Minister of Energy and Resources within three months of the end of each (government) financial year.

The Ministry will publish the report within six months of the end of each financial year.

It will also lead regular assessment and review of energy efficiency policy, and provide advice to the Minister of Energy and Resources on any changes and improvements that can be made to the NZECS.

As the government's primary energy efficiency delivery agency, the Energy Efficiency and Conservation Authority (EECA) has a central role in NZECS implementation.

## 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 EECA. 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.



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