APPENDIX 2

Draft New Zealand
Energy Strategy

Developing our energy potential

and the Draft New Zealand
Energy Efficiency and Conservation Strategy

July 2010

Contents

Published in July 2010 on behalf of the
New Zealand Government by

Ministry of Economic Development
Head Office, 33 Bowen Street, Wellington
Telephone: +64 4 978 3100
www.med.govt.nz

Available online at: www.med.govt.nz/energystrategy.

ISBN 978-0-478-35863-6 (html)
ISBN 978-0-478-35862-9 (PDF)
ISBN 978-0-478-35861-2 (print version)

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 invite you to read this draft strategy and I look forward to receiving your feedback on the Government's statement of direction for the supply and use of energy in New Zealand.

Hon. Gerry Brownlee
Minister of Energy and Resources

Introduction

The draft New Zealand Energy Strategy proposes the Government's direction for energy and the role energy will play in New Zealand's economy.

This is a draft to replace 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 draft 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. The draft is not intended to offer detailed lists of actions, but rather to provide strategic direction.

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

Realising our potential

The draft New Zealand Energy Strategy proposes 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 plentiful untapped solar energy and could potentially harness the power of the oceans that surround us for marine energy. 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.

The Government aims to explore how to direct energy resources to achieve significant shifts in economic growth in an environmentally responsible manner, with all the flow-on benefits to society economic growth will provide. This draft strategy proposes what role the Government can play, alongside others, in achieving this.

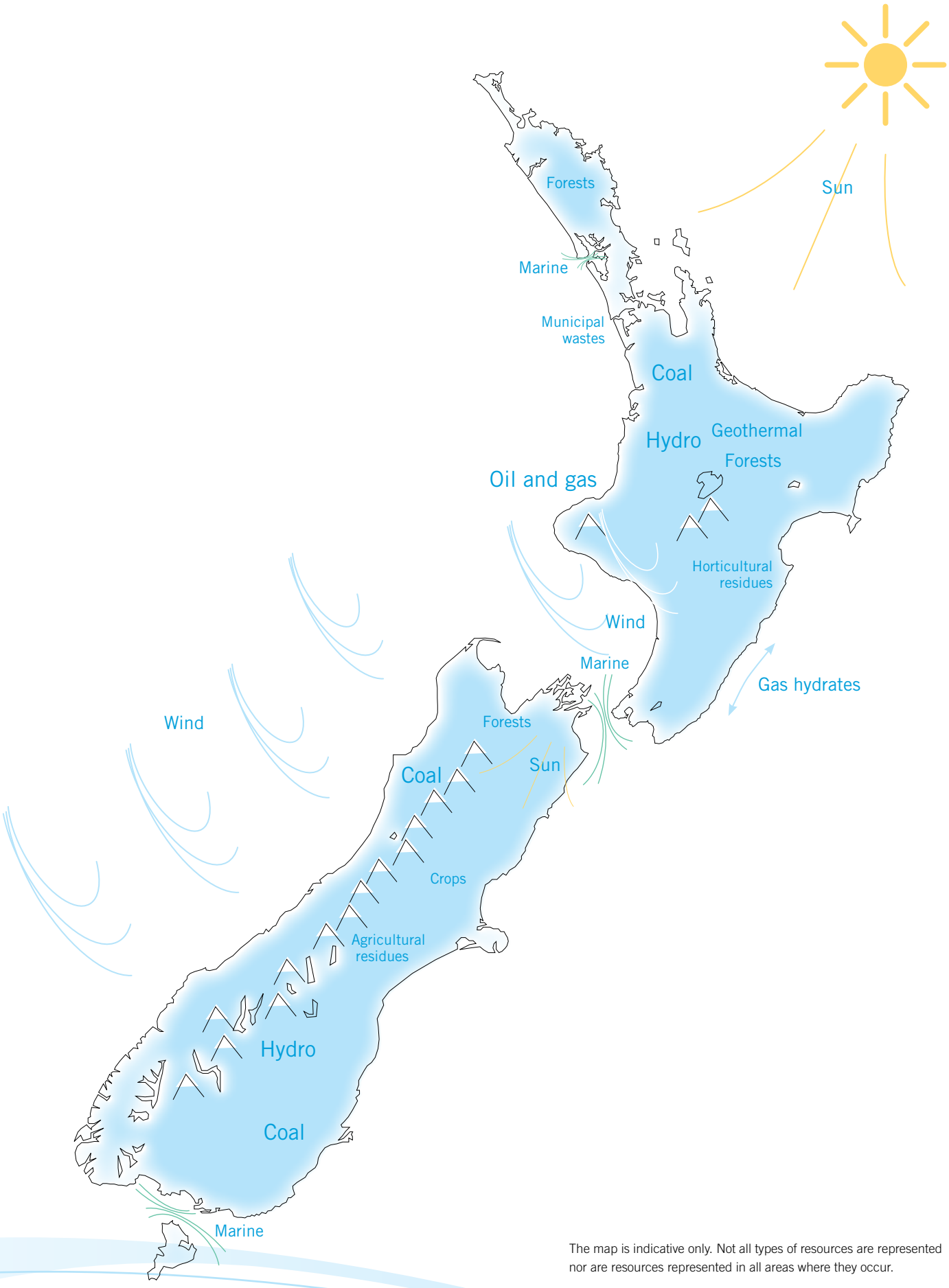
Being efficient in our use of energy supports productivity and cuts consumer costs. The Government will continue to support consumers to better manage their energy use and make good choices relating to the energy performance of their vehicles, appliances, homes and businesses.

Over the next 40 years, New Zealand's energy mix is expected to change. The international economy will reward efforts to reduce greenhouse gas emissions to address climate change. Energy-related greenhouse gas emissions in New Zealand will reduce in the longer term.

International oil prices will continue to be volatile and will rise over the longer term. Oil and gas resources will flow to their highest value use. Increases in oil prices will strengthen incentives to find alternatives. Higher prices and greater pressure on resources worldwide will drive improvements in energy efficiency. Energy for transport is likely to come from a number of different fuel sources.

There will be significant changes in technology and infrastructure. New energy resources will be used, and resources used more effectively.

This draft proposes a course to make the most of the opportunities and to respond positively to the challenges and changes ahead.



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 per cent 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 more expensive and prices are volatile. 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 followed by 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 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 broadband 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, and
- the environment is recognised for its importance to our New Zealand way of life.

It is the actions of all New Zealanders – individuals, communities, businesses, Māori, local government – as well as the Government that will enable New Zealand to realise the direction proposed by this draft strategy.

This draft strategy proposes four priorities and twelve areas of focus that are intended to support New Zealand to make the most of its energy potential.

The structure of the draft strategy is outlined in the table. Note that some areas of focus do relate to more than one priority, but for convenience are placed in just one section.

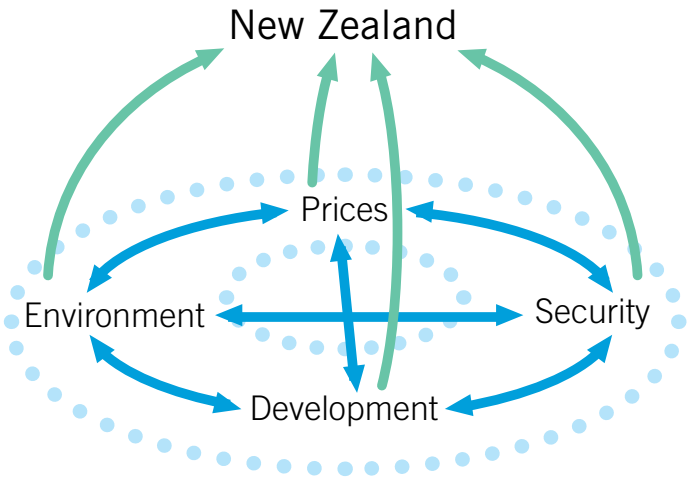
Structure of the Draft New Zealand Energy Strategy

Areas of focus	Priorities	Goal
1. Develop petroleum and mineral fuel resources 2. Develop renewable energy resources 3. Embrace new energy technologies	Develop resources	Making the most of our energy potential
4. Competitive energy markets deliver value for money 5. Oil security and transport 6. Reliable electricity supply	Secure and affordable energy	
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	Efficient use	
11. Best practice in environmental management for energy projects 12. Reduce energy-related greenhouse gas emissions	Environmental responsibility	

There are inherent tensions and trade-offs in delivering energy policy. The figure (right) illustrates that energy security, prices, the environment and development all have a relationship with each other, as well as each contributing to the overall goal. The Government must balance these tensions.

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

Also, it is important that competitive energy markets have appropriate signals, checks and balances in place to achieve an optimal outcome for energy security while keeping prices competitive.



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, and
- providing diverse sources of reliable energy at competitive prices within New Zealand.

This section sets out three broad areas on 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 area of focus covers renewable energy resources. The third area of focus is on 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.

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.

In November 2009 the Government released a Petroleum Action Plan to focus work over 2010 and beyond[1].

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 mining practices.

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 more likely to be fully realised if an economic way to reduce high levels of greenhouse gas emissions is found. Carbon capture and storage technology (CCS) will potentially be an effective way of utilising resources while reducing CO_2 emissions.

[1] The full plan can be accessed at www.med.govt.nz/petroleum-action-plan.

2 Develop renewable energy resources

New Zealand benefits substantially from use of its abundant renewable energy resources. In 2009, 73 per cent 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.

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 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 will improve its resilience to disruptions in energy supply through utilising a wider range of energy resources and by replacing oil with local energy sources.

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

Government policies will 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. Government actions will include:

- Considering what role Government will take to encourage biomass-to-energy development. This could include encouraging industry and market development for viable proven technologies with low uptake, and positioning New Zealand to take advantage of new emerging technologies.
- Investigating how Government can 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 remove unnecessary barriers to the uptake of medium and smaller scale renewable 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.
- Continuing the Marine Energy Deployment Fund to 2011 and encouraging the emerging industry as appropriate.

Renewable target for electricity generation

The Government retains the aspirational, but achievable, target that 90 per cent 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 73 per cent of electricity generation in 2009.

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.

Considerable effort into research and development of new energy technologies is taking place around the world. Successful technologies will emerge that we do not 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.

New Zealand will keep abreast of international developments and innovations. Opportunities for New Zealand will be enhanced by 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. In the immediate term, Government research funding will support research to improve petroleum and mineral extraction, energy security and efficient and affordable energy use. Research in the areas of bioenergy and geothermal energy are also priorities.

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. CCS will potentially provide CO_2 reduction options for a range of energy resources. In New Zealand, these could include gas, oil, geothermal and biomass production, as well as conversion of coal to liquids.

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 and low enthalpy sources 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 gas. 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 potentially, fuel 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. 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 the Electricity Market.

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.

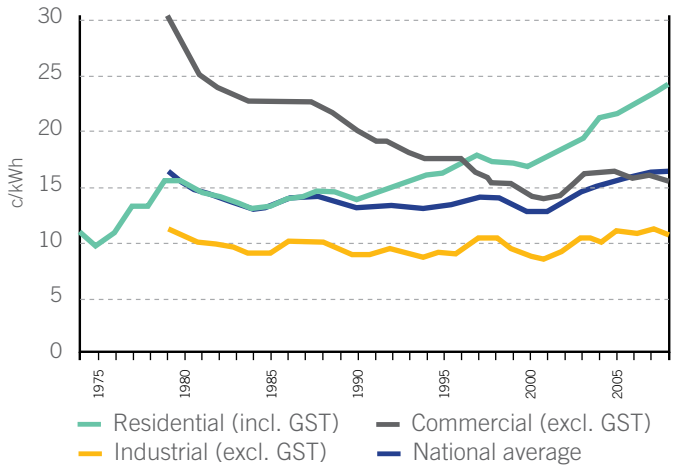
Individuals, businesses and communities are more resilient to supply disruptions when we have choices, for example in how we heat our homes or the transport we use.

Competitive electricity market

Concern over significant price increases, particularly for residential electricity over the past ten years and around governance arrangements were the two main drivers for the Government's major review of the electricity market performance in 2009.

The graph shows the cost of electricity paid by various sectors in real terms from 1974 to 2008 using 2008 dollars.

Rising household electricity prices over time (Real 2008)[2]



The review resulted in Cabinet agreement to a suite of changes to New Zealand's electricity system to improve competition and constrain price increases, improve security of supply, and ensure effective and streamlined governance. The changes are being put in place starting in 2010. The majority of the changes are in the Electricity Industry Bill.

Details of improvements to competition and streamlining of governance arrangements to constrain price increases are available at: www.med.govt.nz/electricity.

2 *New Zealand Energy Data File*. Ministry of Economic Development; 2009; p 133.

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.

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 liquid 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[3].

Energy affordability and vulnerable consumers

Every household in New Zealand should be able to heat and light their home adequately, but even the most efficient 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 Government will ensure the electricity sector continues to safeguard vulnerable consumers so that they do not have their electricity disconnected without due warnings.

5 Oil security and transport

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[4]. Oil and gas are also critical feedstocks for industry and agriculture (for example, gas is used to make fertilisers).

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 a national emergency response strategy in place in the event of a disruption to oil supply.

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, such as biofuels or converting coal to liquids (with CCS), 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 remain volatile but on an upward path over the coming decades and that this price path (especially price spikes) will help to stimulate the use of alternative energy sources whose prices are not impacted by the oil market. Such alternatives include electric vehicle technologies and fuel cells.

3 www.med.govt.nz/oil/monitor/.
4 *New Zealand Energy Data File*. Ministry of Economic Development; 2009; pp 12-13.

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 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 where appropriate.

For example, the Government has:

- Set up a $36 million grants programme until 2012 for New Zealand-produced biodiesel production (to put biodiesel on an equal footing with bioethanol).
- Exempted light electric vehicles from road user charges until 2013.

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.

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 draft, 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, measures are proposed in the Electricity Industry Bill. The Government proposes to phase out the reserve energy scheme and ensure 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 investigate improving emergency access to 'reserve' water in hydro lakes. It will 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.

Priority: Efficient use

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.

Further detail on Government policies for energy efficiency is provided in the draft 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 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 (EECA).

'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.

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[5] will continue to 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 rating building energy performance.

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.

The Government will focus on improving vehicle efficiency, promoting efficient fleet management for commercial fleets. It will also improve 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 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.

[5] Many of the programmes are delivered by the Energy Efficiency and Conservation Authority (EECA). See www.eecabusiness.govt.nz/.

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 *Warm Up New Zealand: Heat Smart* programme provides a subsidy to homeowners to install insulation and clean heating devices in their homes. This programme will 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 186,500 homes, including providing higher levels of support for at least 70,000 lower income homes.

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 do not need it, such as turning lights off when we leave a room.

Energy efficiency improvements support achievement of all the goals in this strategy. As individuals we save money and reduce greenhouse gas emissions. Making energy savings across the economy 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.

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.

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 agricultural exports and tourism.

Over time, sourcing an increased proportion of New Zealand's energy from low-emissions renewables will assist the country to reduce its greenhouse gas emissions.

11 Best practice in environmental management for energy projects

Best practice in developing energy resources

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

'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 is expected to 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 is being developed to 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.

Best practice in the environmental effects of energy use

The Government has an ongoing role 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 (e.g. particulates) from diesel and petrol combustion that affect human health.
- Zinc residues from tyres that wash off roads and build up in waterways, affecting aquatic animals.
- The release of particulates from the burning of wood, coal, waste oils and other products 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.

The role of local government

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

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 to 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 and 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 the major urban centres.[6]

Local authorities also 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

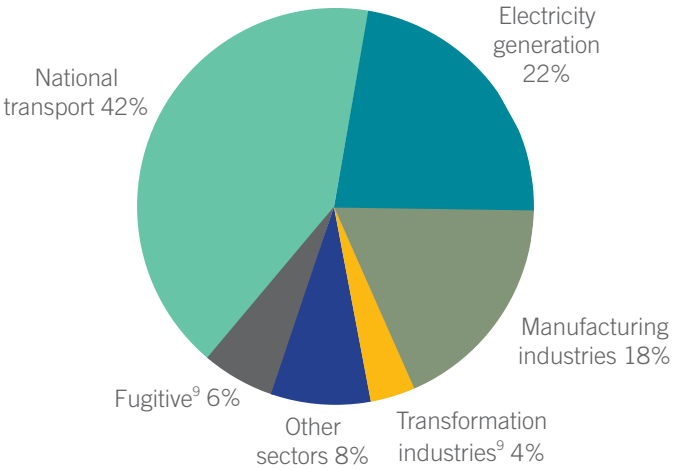
The Government has adopted an economy-wide target for a 50 per cent reduction in New Zealand's carbon-equivalent net emissions, compared to 1990 levels, by 2050.

As government representatives stated during the climate change negotiations at Copenhagen, New Zealand is prepared to take on a responsibility target for greenhouse gas emissions reductions of between 10 per cent and 20 per cent below 1990 levels by 2020, if there is a comprehensive global agreement and certain conditions are met. (Details on Government targets are available at www.climatechange.govt.nz.)

Energy-related greenhouse gas emissions

The supply and consumption of energy accounted for 43 per cent of total New Zealand emissions in 2007[7]. Energy sector emissions have increased significantly since 1990. Electricity emissions have increased by 91 per cent and transport emissions by 64 per cent.[8]

This pie chart provides a breakdown of energy emissions by sector in 2008.



6 *Government Policy Statement on Land Transport Funding;* Ministry of Transport; paragraph 34, p 11.

7 *New Zealand's Greenhouse Gas Inventory 1990–2007*, available at www.mfe.govt.nz/publications/climate/greenhouse-gas-inventory-2009/index.html.

8 *New Zealand Energy Greenhouse Gas Emissions.* Ministry of Economic Development; 2009; p 10.

9 **Transformation industries:** Emissions arising from the combustion of fuel to transform energy to an altered form, such as petroleum refining and oil and gas extraction and processing. **Fugitive:** Emissions arising from the production, processing, transmission and storage of fuels, such as coal, natural gas, oil and geothermal steam. See *New Zealand Energy Greenhouse Gas Emissions.* Ministry of Economic Development; 2009; pp 16 & 18.

Government policies that will reduce energy greenhouse gas emissions include:

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

The New Zealand Emissions Trading Scheme (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 other policies facilitating development of renewable energy in all forms, including biofuels and direct heating will also assist in lowering emissions. Policies such as fuel efficiency labels on vehicles, biodiesel production grants and support for electric vehicles will help to reduce transport emissions.

The energy efficiency programmes outlined in this document also contribute to reducing greenhouse gas emissions from energy, where they lead to fossil fuel savings.

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.

Relevant government agencies involved in implementation include, but are not limited to, the Ministry of Economic Development, Energy Efficiency and Conservation Authority, Electricity Commission, Ministry for the Environment, Ministry of Transport, Treasury, Ministry of Agriculture and Forestry, Ministry of Research, Science and Technology, Department of Building and Housing, Ministry of Social Development and the Foundation for Research, Science and Technology.

Reporting

It is proposed that 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 draft New Zealand Energy Efficiency and Conservation Strategy 2010 (NZEECS) is a companion to the Government's proposed primary statement of energy policy set out in the draft New Zealand Energy Strategy.

The draft NZEECS is prepared under the Energy Efficiency and Conservation Act 2000 to promote energy efficiency, energy conservation and renewable energy in New Zealand. It proposes Government's policies, objectives, and targets for the next five years (to 2015), and the means by which these will be achieved.

This draft is issued for public consultation. As required by the Energy Efficiency and Conservation Act 2000, a new version of the NZEECS will be in force once a final version is publicly notified and issued by the Minister of Energy and Resources, for a period of five years.

Draft 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 draft NZEECS contributes to the delivery of Government's energy priorities set out in the draft New Zealand Energy Strategy (NZES).

Policies and partnerships

Effective energy markets are critical for improved energy productivity. Yet markets range in their level of sophistication and development.

As a result households and firms often do not make the necessary investments to realise existing and emerging energy productivity opportunities.

To help investment in energy productivity, this draft NZEECS proposes 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, and
- Research and development – to support innovative capability.

The exact mix of measures adopted by relevant government agencies to deliver this proposed NZEECS in energy using sectors 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.[10]

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

Economy-wide target to 2015

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

The Government's proposed energy efficiency target is for the NZEECS to deliver 55 petajoules (PJ) of saving across the economy by 2015.

The energy saving from these efficiency improvements equates to approximately a nine per cent improvement (reduction) in New Zealand's economy-wide energy intensity level by 2015.

This improvement would increase New Zealand's rate of energy intensity improvement from one to 1.2 per cent per annum (from 2008 levels).

The saving achieved would equate to equivalent greenhouse gas emissions savings of approximately 4.2 Mt CO_2-e in 2015.

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

To achieve this target New Zealand will need to lift its medium term (1995-2007) trend in underlying energy efficiency improvement from 0.7 per cent per annum to one more aligned with other IEA countries, which is approximately one per cent per annum.

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 could expect to see such a step change occur.

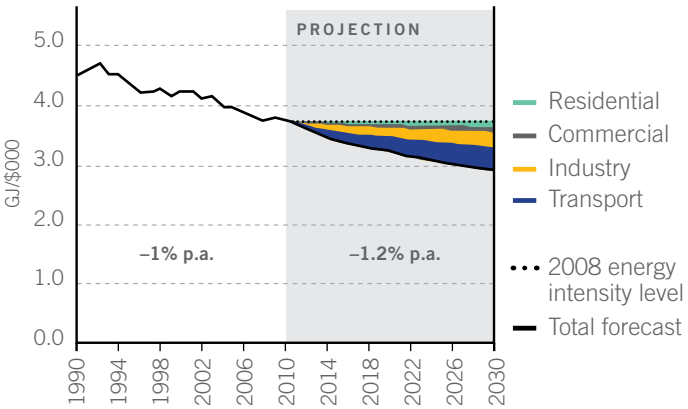
Achieving the target will require a close partnership between government, firms and households to develop the right mix of new policies and programmes to fully realise the opportunities that exist.

10 See *New Zealand Energy Data File:* Ministry of Economic Development; 2009; p 15 for more information on energy intensity.

Sector targets

The graph below suggests where the potential for energy efficiency improvements are projected to lie within various sectors of the New Zealand economy, providing a guide to policy priorities.

New Zealand's Energy Intensity to 2030



Source: MED

The greatest potential for improvement is in the transport and business sectors followed by the residential sector.

The table lists the proposed NZEECS sector targets and objectives. The targets are to 2015 from a baseline year of 2008 unless otherwise noted.

In addition to savings derived from energy efficiency improvements, complementary renewable energy targets are provided where appropriate in the strategy.

The draft NZEECS targets and objectives propose 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 is constantly changing.

Accountabilities

This draft NZEECS is 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 non-government 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 draft 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 draft NZEECS is described in the *Governance* section towards the end of this document.

Sector objectives and targets

Targets are 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
Transport A more energy efficient transport system, with a greater diversity of fuels and renewable energy technologies.	29 PJ of savings. A four per cent improvement from 2008 levels in GJ/kilometres travelled on land.
Business Enhanced business growth and competitiveness from energy productivity investment.	21 PJ of savings (16PJ of savings in industry and five PJ in the commercial sector). 14 per cent improvement in the commercial and industrial sector energy intensity level (GJ/$1000 of GDP). An additional 9.5 PJ of energy utilised for heat and/or fuel from biomass and/or geothermal sources, per year by 2025.
Homes 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.
Products Greater business and consumer uptake of energy efficient products.	Extend Minimum Energy Performance Standards (MEPS), labelling and EnergyStar product coverage to remain in line with major trading partners.
Electricity System An efficient, renewable electricity system supporting New Zealand's global competitiveness.	90 per cent of electricity will be generated by renewable sources by 2025, providing supply security is maintained.
Public Sector Greater value for money from the public sector through increased energy efficiency.	10 per cent reduction in energy use per full time staff equivalent compared with 2008/09 baseline.

Transport

Objective

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

Targets

By 2015: 29 PJ of savings.[11]
By 2015: A four per cent improvement from 2008 levels in GJ/kilometres travelled on land.

Responsibility

Lead: Ministry of Transport.

Support: The NZ Transport Agency; Ministry of Economic Development and the Energy Efficiency and Conservation Authority.

Rationale

Oil provides 51 per cent 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.

Opportunities exist for better integration of road freight with rail and shipping networks and ports 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 the draft NZEECS's objective and targets for the transport sector include a mix of information, incentives, capability building and codes and standards.

This mix of policy actions will facilitate continued energy productivity gains in the commercial vehicle and light vehicle fleets.

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 also 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 passenger vehicles and freight can move more efficiently.

The Government will continue to support improvements to road and public transport, including electrifying the Auckland rail system and upgrading the Wellington rail system.

The Government will also 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 cities, e.g. walking, cycle ways and public transport systems.

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

The Government will promote efficient business fleet management through provision of information and audit programmes, such as professional driver training under the SAFED (Safe and Fuel Efficient Driving) New Zealand brand.

The Government supports the aviation industry's efforts to reduce use of conventional aviation fuel as this is strategically important to the tourism industry.

The Government will continue to encourage the entry of biofuels and electric vehicles into the New Zealand market.

The Government also recognises that vehicle fuel economy labelling for all post 2000 light vehicles is having a positive impact on vehicle purchase decisions. The Government will investigate the optimal mix of measures that can be successfully applied in New Zealand to continue to improve the rate of energy efficiency gain in the fleet.

11 The PJ energy savings targets equate 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 PJ savings (16 PJ savings in industry; five PJ commercial).
By 2015: 14 per cent improvement in the commercial and industrial sector energy intensity level (GJ/$1000 of GDP).
By 2025: An additional 9.5 PJ of energy utilised for heat and/or fuel from biomass and/or geothermal sources, per year.

Responsibility

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

Support: Department of Building and Housing; Ministry of Agriculture and Forestry; Ministry of Research, Science and Technology; Ministry of Tourism.

Rationale

Many New Zealand service, agricultural and manufacturing companies are engaged in maximising energy productivity in their processes and supply chains.

Energy savings can help firms' bottom line and enable them to better market products in environmentally conscious export markets.

Increasingly, information on energy efficiency, consumption and energy related greenhouse gas emissions is looked for by consumers when making purchases.

That said, New Zealand is a small economy and the level of business capability 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.

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

Policy

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

- Encourage a long term view conducive to investments seeking energy productivity improvements.
- Build management capability to identify and exploit opportunities to ensure energy productivity good practice is reflected in mainstream business planning.
- 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.
- Encourage major firms proficient in energy productivity practices to champion good practice across the wider business community.
- 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.
- Help industry to recognise and exploit opportunities for utilisation of geothermal and bioenergy sources.

The Government is currently reviewing its existing business programmes to ensure that the right mix of information, incentives, codes and standards are in place.

Business *continued*

This review will ensure that government actions are developed with strategic input from the private sector and that future activity is aligned with the areas of greatest potential for energy productivity improvements.

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.

Buildings

In the commercial building sector, the Government will look to 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.

The Building Code provides minimum standards for heating, ventilation and cooling (HVAC) and lighting. These standards will be incrementally revised to ensure commercial building practices continue to widely adopt the latest energy productivity concepts 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.

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

Trends towards more energy conscious building design, including the adoption of renewable sources of energy, e.g. rooftop solar photovoltaic systems, all 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.

Targets

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

Responsibility

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

Support: Department of Building and Housing.

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 per cent growth in energy demand from the residential sector since 2001.[12]

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

Property investors may 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.

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.

For example, by 2015 the Government expects to have supported the insulation and clean heating of at least 186,500 homes through the *Warm Up New Zealand: Heat Smart* programme.

The programme provides an incentive for homeowners to leverage further private 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 standards for the installation of insulation and renewable energy features such as solar hot water heating in homes. Recent changes are expected to deliver ongoing energy savings. As new technologies and building practices emerge, further incremental improvements will be required to ensure the Code and relevant standards keep pace.

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.

Energy rating tools for homes, which provide purchasers and prospective tenants with credible information on energy performance, is one area where the Government is currently supporting industry in developing innovative voluntary solutions.

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

This extends to providing 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.

12 *Energy Efficiency and Renewable Energy in New Zealand Year Six Report*: EECA (March 2009).

Products

Objective

Greater business and consumer uptake of energy efficient products.

Target[13]

By 2015: Extend MEPS, labelling and EnergyStar product coverage to remain in line with major trading partners.

Responsibilities

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 and prone to information asymmetries. For example firms and households can make purchase choices unaware of the long term energy costs of products.

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.

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 (MEPS) and related energy labelling will only be used on selected products with relatively large energy savings potential.

This work will be conducted in partnership with Australian regulators and business and community groups.

Having common standards and energy labelling information supports closer economic relationships with Australia and reduces compliance costs for product manufacturers and suppliers.

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

13 Products are not in themselves a sector of the economy. 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.

Electricity System

Objective

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

Target

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

Responsibility

Lead: Ministry of Economic Development.

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

Rationale

Some 70 per cent of New Zealand's electricity system 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 per cent 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 incoming emissions pricing through the Emissions Trading Scheme.

That said, the electricity system faces a number of challenges to the achievement of this goal. New projects face consenting restraints and integrating intermittent renewables into the existing system creates new challenges.

Good investment decision making also requires the consideration of demand management options, e.g. energy efficiency programmes. Improved access to information about electricity use assists businesses and consumers to better manage their energy use.

Such programmes should be implemented where they provide a more cost effective option than the long run marginal cost of new electricity supply.

Investing in electricity efficiency 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.

Policy

The following actions will help drive greater energy productivity in the electricity sector over the next five years:

- Removing unnecessary barriers to investment in large-scale renewable electricity generation, building on recent changes to streamline and simplify consenting processes under the Resource Management Act.
- Incorporating the cost of greenhouse gas emissions into electricity investment decisions through the Emissions Trading Scheme.
- Investigating and removing unnecessary barriers to deployment of smaller scale distributed electricity generation and to the modernisation of electricity networks.
- Fostering the deployment of new renewable sources such as marine and solar sources of energy.
- Ensuring the electricity sector has an appropriate focus on electricity demand management tools.
- Monitoring industry rollout of smart meter, smart network and smart appliance technologies, to promote consumer choice and a more efficient electricity system.

Expected changes to the Electricity Act 1992 aim to provide lines companies with the option of developing smaller scale electricity generation. These changes are expected to provide new options for remote communities presently serviced by uneconomic lines.

The Government expects the regulator, system operator, and lines companies to minimise lines losses and make efficiency gains in the operation of the system, and plan ahead to ensure the system can securely support a greater proportion of renewable generation in the future.

The Public Sector

Objective

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

Target

By 2015: 10 per cent reduction in energy use per full-time staff equivalent compared with a 2008/09 baseline.

Responsibility

Lead: Ministry of Economic Development.

Support: Energy Efficiency and Conservation Authority; Housing New Zealand Corporation.

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 major 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.

Policy

The Government procurement reform agenda will provide the means for a renewed emphasis on the purchase and lease of energy efficient appliances, equipment, and vehicles.

As part of its prudent management of public assets, the Government will seek to identify viable energy productivity improvement opportunities.

Focusing on high energy users, the Government will identify and address areas of greatest potential for energy productivity gains within the wider public sector.

Planned investment on upgrading the state and local government housing portfolio to an appropriate modern standard provides an opportunity to further exploit energy productivity opportunities in the building and construction sector.

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 draft NZEECS's goals, the Government will continue to encourage local government to think strategically on energy issues. To this end the Government will continue to support local government to maximise energy productivity gains in their regions.

Governance

Delivery

The NZEECS is a New Zealand Government strategy, and as such, the means by which the policies, objectives and targets in this draft are proposed to be achieved relate to a number of ministerial portfolios and public sector agencies.

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

It is proposed that the lead and support agencies identified in this draft NZEECS will be required to develop appropriate policy measures that contribute to the realisation of the NZEECS's targets and objectives. Policy measures will be recorded in annual Output Agreements with respective Ministers and in Statements of Intent presented to Parliament.

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

When determining the means by which the policies, objectives and targets in this draft are to be achieved, the Government proposes to give regard to the following key questions:

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

Monitoring progress and review

It is proposed that MED, with cooperation from the Senior Energy Officials Group, will also monitor progress towards the NZEECS'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.

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

MED also has responsibility to 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 NZEECS.

As the Government's primary energy efficiency delivery agency, the Energy Efficiency and Conservation Authority (EECA) will have a central role in NZEECS 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 MED, 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.

How to make a submission

The Government invites you to make a submission on the draft New Zealand Energy Strategy and/or the draft New Zealand Energy Efficiency and Conservation Strategy.

You may submit on both strategies in the same submission. If possible, please differentiate which parts of your submission relate to the NZES and the NZEECS.

Submissions are due by: **5pm, Thursday 2 September 2010**.

Please email your submission (on either or both strategies) to nzes@med.govt.nz.

Alternatively, you may post your submission to:

Draft Energy Strategies
Ministry of Economic Development
PO Box 1473
Wellington

Your submission will be made public

Written submissions are discoverable under the Official Information Act 1982 (OIA). If you wish all or part of your submission to be treated as confidential, please clearly identify the material and note under which provisions of the OIA the information should be withheld. Note the Ministry will make the final decision as to its confidentiality.

For more information about the New Zealand Government's activities and functions with respect to energy, please visit www.med.govt.nz and www.eeca.govt.nz.

Questions

Please use these questions as a guide to preparing your submission.

New Zealand Energy Strategy

1. Does the proposed NZES effectively promote and support the appropriate development and use of energy resources? If not, what changes do you propose?
2. What barriers to investment in energy resources are not addressed?
3. Do you have any comments on the proposed goal, priorities and 12 areas of focus? What would you change, and why?
4. Where the draft NZES proposes the Government will support or encourage industry activity, how do you consider the Government can best provide this support or encouragement?
5. Do you have other comments?

New Zealand Energy Efficiency and Conservation Strategy

1. Does the draft NZEECS clearly explain the Government's policy and priorities for promoting energy efficiency, energy conservation and renewable energy over the next five years? What do you consider are the priorities?
2. For each sector, are the objectives, targets, rationale and policy outlined in the draft appropriate? What changes do you propose?
3. What should the Government do to deliver the NZEECS? In many cases the draft suggests the Government will 'support' or 'encourage' other parties to make changes. How do you consider this support or encouragement is best provided?
4. Where should the private sector, such as firms or industry associations, take the lead?
5. Do you have other comments?

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