



**MINISTRY OF BUSINESS,  
INNOVATION & EMPLOYMENT**  
HĪKINA WHAKATUTUKI

# Unlocking our energy productivity and renewable potential



DRAFT NEW ZEALAND ENERGY EFFICIENCY  
AND CONSERVATION STRATEGY 2017-2022

[New Zealand Government](#)



**Energy Efficiency and  
Conservation Authority**  
Te Tari Tiaki Pūngao

This document has been prepared on behalf of the New Zealand Government by :

**Ministry of Business, Innovation & Employment**

PO Box 1473, Wellington 6140

New Zealand

[www.mbie.govt.nz](http://www.mbie.govt.nz)

Photo credit:

**Image one:** Chris Williams. Exploring the geothermal wonders, Te Puia.

**Image two:** C. Keeping the power going at West Wind farm, Makara.

**Image three:** Sara Orme. The innovative, collaborative and solar-powered Te Oro Musical and Arts Centre, Glenn Innes.

All cover photos are sourced from the New Zealand Story Group via [www.nzstory.govt.nz](http://www.nzstory.govt.nz).

ISBN: 978-0-947524-70-8 (online)

December, 2016

© Crown Copyright 2016

The material contained in this report is subject to Crown copyright protection unless otherwise indicated. The Crown copyright protected material may be reproduced free of charge in any format or media without requiring specific permission. This is subject to the material being reproduced accurately and not being used in a derogatory manner or in a misleading context. Where the material is being published or issued to others, the source and copyright status should be acknowledged. The permission to reproduce Crown copyright protected material does not extend to any material in this report that is identified as being the copyright of a third party. Authorisation to reproduce such material should be obtained from the copyright holders.

New Zealand Government

## Foreword – Minister of Energy and Resources

It is an exciting and challenging time to be part of the energy sector, here in New Zealand and globally.

Technological transformation, changing consumer preferences and demands, a growing focus on the critical role energy plays in business competitiveness, volatile commodity prices, the need to transition to a lower carbon economy – all these factors are playing an important part in the ever-changing domestic and international energy context.

Maximising the value we obtain from energy use enhances business performance, minimises household costs and benefits our economy as a whole. There are more opportunities for improving energy efficiency and productivity than ever.

As a party to the historic Paris climate change agreement, New Zealand is committed to reducing greenhouse gas emissions. Our target is to reduce emissions to 30 per cent below 2005 levels by 2030. Businesses, individuals and the Government will need to work together to unlock our energy productivity and renewable potential to contribute to progress towards this target.

New Zealand is blessed with an abundant supply of renewable energy resources, and already has one of the highest shares of renewable electricity generation in the world. To leverage our renewable advantage we should not only focus on renewable electricity generation but also energy-saving and fuel-switching opportunities in other sectors.

Our greatest potential to reduce carbon lies in our process heat sector for industrial and commercial users, and in our transport sector; both have a much larger proportion of non-renewable energy than electricity.

We need to continue to build a willingness to do things differently, and awareness that energy efficiency and increased use of our renewable advantage are critical game-changers for our environment and our economy.

This Strategy sets out the objectives, actions and targets for energy efficiency and renewable energy for the next five years, and will continue to support the New Zealand Energy Strategy 2011–2021.

I am confident that this Strategy will help steer businesses, individuals and the Government towards taking actions that will enable our transition towards a smarter, lower-carbon and more productive economy.

Hon Simon Bridges  
**Minister of Energy and Resources**

## Contents

Foreword – Minister of Energy and Resources .....	3
Contents .....	4
Introduction .....	5
Why do energy productivity, efficiency and emissions reduction matter? .....	5
How does the Strategy fit in with Government priorities? .....	7
Unlocking our energy productivity and renewable potential .....	9
Goal .....	9
Objectives.....	9
The three priority areas .....	9
1. Renewable and efficient use of process heat .....	9
2. Efficient and low emissions transport .....	10
3. Innovative and efficient use of electricity.....	11
What actions can we take? .....	12
Businesses .....	12
Individuals .....	14
Public Sector agencies.....	15
Cross-cutting actions.....	16
How will we track progress? .....	17
Targets.....	17
Governance .....	19
Glossary .....	20

## Introduction

This document; “Unlocking our energy productivity and renewable potential,” the New Zealand Energy Efficiency and Conservation Strategy 2017-2022 (the **Strategy**), is a companion to the New Zealand Energy Strategy 2011-2021 (the **NZES**).

This Strategy sets the overarching policy direction for government support and intervention, and guides the work programme of the Energy Efficiency and Conservation Authority (**EECA**) over the next five years.

The goal of this Strategy is to support New Zealand to be an energy efficient, productive and low emissions economy. It encourages businesses, individuals, and public sector agencies to take actions that will help us to unlock our renewable energy, energy efficiency and productivity potential, to the benefit of all New Zealanders.

The International Energy Agency (**IEA**) has identified a number of potential benefits from increasing energy efficiency and renewable energy use (see the table below), including public benefits that support government priorities (such as economic growth and emissions reduction) and private benefits for businesses and consumers (such as lower energy costs).

Multiple benefits of increasing energy efficiency and renewable energy use <sup>1</sup>	
Public benefits	Private benefits
Employment and market growth in energy efficiency and renewables	Cost reduction, energy affordability, low energy prices
GDP growth	Productivity, competitiveness, product quality, employee comfort and satisfaction
Productivity and competitiveness	
Reputational benefits from reduced environmental impacts	
Energy system resilience and security	Reputational benefits from reduced environmental impacts
Reduced reliance on imported fuels	
Emissions reductions	
Improved air quality	Health and wellbeing, comfort, reduced respiratory illness
Reduced public health costs	

## Why do energy productivity, efficiency and emissions reduction matter?

New Zealand’s renewable energy resources are amongst the best in the world. In 2015, more than 80 per cent of our electricity was generated by hydro, geothermal or wind resources.<sup>2</sup> We have significant bioenergy, solar and marine energy potential. In this respect we are well ahead of other countries, which is why the gains to be made lie beyond electricity generation.

<sup>1</sup> Adapted from the International Energy Agency (2014): Capturing the Multiple Benefits of Energy Efficiency. OECD/IEA: Paris.

<sup>2</sup> Ministry of Business, Innovation & Employment (2016): Energy in New Zealand 2015.

Our electricity system only represents about 27 per cent of consumer energy demand,<sup>3</sup> and seven per cent of our gross emissions.<sup>4</sup> The majority of the other energy that we use is sourced from fossil fuels such as oil, coal and gas.

In addition, we are not creating as much value from the energy we use as other countries.<sup>5</sup> This is called energy productivity, which is defined as Gross Domestic Product (GDP) per unit of energy used. Nor are we improving our energy productivity as fast as other countries, which could see us slip further behind.

To meet our economic growth and climate change goals, we need to raise energy productivity and make greater efforts to reduce our energy-related emissions (see the table below).

Raising energy productivity	Reducing emissions and switching to renewables	Embracing technology and innovation
<p>Countries around the world have recognised energy productivity is a critical factor in business competitiveness and innovation. New Zealand’s energy productivity improvement is lagging behind other countries such as the US, UK and Australia. Raising energy productivity helps business reduce costs, innovate, manage risk and optimise systems. There is significant potential for our export industries to capitalise on high energy productivity, and on our renewable advantage.</p>	<p>New Zealand has committed to reducing its greenhouse gas emissions. This includes our 2021-2030 target of 30 per cent below 2005 emissions levels by 2030, and a long-term target of 50 per cent below our 1990 emissions levels by 2050. New Zealand’s energy users can play a significant role in reducing our emissions through energy efficiency improvements. Converting from fossil fuels to renewable energy unlocks further emissions reductions and reduces dependence on energy imports.</p>	<p>Technology is advancing rapidly. This is leading to changing consumer preferences and new innovations such as home electricity generation, intelligent energy management systems, energy storage and electric vehicles. New technologies give us greater choice about how to meet our energy needs, and enable us to use energy more efficiently and at lower cost every day.</p>

Cost-effective energy efficiency improvements could reduce New Zealand’s energy use. For example, modelling by the BusinessNZ Energy Council shows energy efficiency improvements could be by as much as 11 to 14 per cent by 2030.<sup>6</sup> However, EECA’s activities and international experience<sup>7</sup> demonstrate that many barriers contribute to the limited uptake of energy efficiency (see the box below).

By investing in energy efficiency, businesses can improve their competitiveness, gain brand advantages, lower operating and maintenance costs, and contribute to better working conditions.

<sup>3</sup> Ministry of Business, Innovation & Employment (2016): Energy in New Zealand 2015.

<sup>4</sup> Ministry for the Environment (2016): New Zealand’s Greenhouse Gas Inventory 1990-2014.

<sup>5</sup> Sources: International Energy Agency (2016). In-depth Review of New Zealand 2016 and World Energy Council (2016). 2016 Trilemma Index.

<sup>6</sup> BusinessNZ Energy Council (2016) 2050 Energy Scenarios [www.bec.org.nz/projects/bec2050](http://www.bec.org.nz/projects/bec2050).

<sup>7</sup> Sources include: 1) International Energy Agency (2011). Energy efficiency policy and carbon pricing. OECD/IEA: Paris. [https://www.iea.org/publications/freepublications/publication/EE\\_Carbon\\_Pricing.pdf](https://www.iea.org/publications/freepublications/publication/EE_Carbon_Pricing.pdf) and 2) McKinsey and Company (2009). Unlocking energy efficiency in the U.S. economy.

This is particularly important in New Zealand's export-led economy for two reasons. First, we know productive firms are more likely to become exporters. Secondly, as climate change issues become more important, our export markets may start to focus more on the embodied carbon<sup>8</sup> in imported goods, and perhaps even services.

In order to make the most of these opportunities and avoid falling behind our competitors, we need to continue to develop a productive economy where all regions and people have the opportunity to grow and prosper – at the same time as reducing our emissions.

New Zealand's emissions are mainly from the agriculture and energy sectors (including transport). The energy sector makes up nearly 40 per cent of gross emissions.<sup>9</sup> Based on current technology and without reducing existing economic activity, New Zealand's greatest potential to reduce emissions lies in our process heat<sup>10</sup> and transport sectors – both of which are significant emitters.

Even though energy efficiency can benefit businesses and households in many ways – including lower costs – opportunities may not be taken up. The non-financial barriers include:

**Imperfect information:** Businesses and individuals can't fully assess the benefits of investment in energy efficiency measures.

**Split incentives:** Those investing in energy efficiency measures are not always the ones receiving the direct benefit, e.g. a landlord provides appliances but the tenant pays the energy bills.

**Principal-agent problems:** Organisations often split energy responsibilities across different parts of the business, so it's accounted for in different budgets.

**Behavioural barriers:** It takes a deliberate effort to change the way an organisation thinks about energy use, e.g. providing good information, teaching new practices, and learning to think from a different perspective.

This Strategy prioritises action in the process heat and transport sectors, as well as electricity generation and consumption because New Zealand stands to benefit greatly from making the most of its clean electricity resources.

## How does the Strategy fit in with Government priorities?

The four priority areas in the NZES provide an overarching framework for this Strategy:

- diverse resource development (including the development of renewable energy)
- environmental responsibility
- efficient use of energy, and
- secure and affordable energy.

The Strategy complements the NZES 2011-2021 and the energy targets being developed by the Government. It also works in parallel with the Government's priority to build a more competitive and productive economy by improving energy efficiency and use of renewable energy to raise productivity, reduce carbon emissions and promote consumer choice (as outlined in the Business Growth Agenda).<sup>11</sup> The Strategy also contributes to transitioning New Zealand to a low emission economy, which is important in terms of meeting our climate change emissions reductions targets.

<sup>8</sup> Carbon emissions associated with energy use and chemical processes during the extraction, manufacture, transportation, assembly, replacement and deconstruction of materials or products.

<sup>9</sup> Ministry for the Environment (2016): New Zealand's Greenhouse Gas Inventory 1990-2014.

<sup>10</sup> Process heat is energy used for commercial processes, manufacturing or heating. For example, meat and dairy processors use steam from boilers to sanitise equipment and process raw products.

<sup>11</sup> [www.mbie.govt.nz/info-services/business/business-growth-agenda](http://www.mbie.govt.nz/info-services/business/business-growth-agenda).

Altogether, the NZES, the emissions reduction targets, new energy targets, and the Business Growth Agenda signal the long-term direction for the energy sector. This replacement Strategy focuses on priorities and supporting actions over the next five years.

A range of government initiatives are already underway which complement the direction set in this Strategy, including the:

- ratification of the 2015 Paris Agreement
- Electric Vehicles Programme
- review of the New Zealand Emissions Trading Scheme
- changes to the Energy Efficiency and Conservation Authority's levy funding, and
- work of the Electricity Authority (**EA**), Commerce Commission and the Ministry of Business, Innovation and Employment (**MBIE**) which takes account of the potential implications of emerging energy technologies.



# Unlocking our energy productivity and renewable potential

*Draft Energy Efficiency and Conservation Strategy 2017-2022*

## Goal

**Support New Zealand to be an energy efficient, productive and low emissions economy.**

We all have a part to play in unlocking our renewable and energy productivity potential. Businesses, individuals, the public sector and market participants are key groups that need to work collectively to solve problems and achieve sustained benefits for New Zealand.

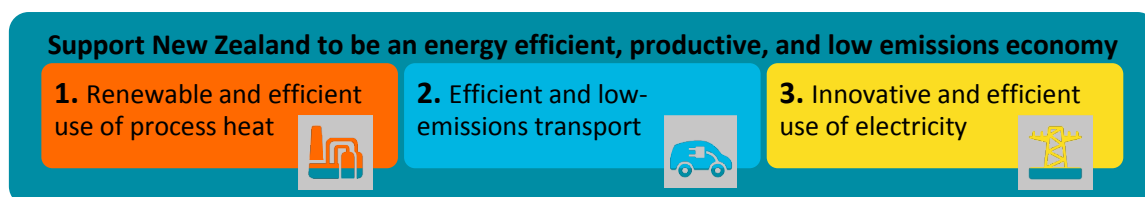
This Strategy identifies four objectives – one for each key group, and one that all market participants can influence.

## Objectives

1. **Businesses** make energy efficient and renewable energy investments and adopt best practice energy management.
2. **Individuals** choose energy efficient technologies, adopt energy efficient behaviours and make greater use of renewable energy.
3. **The public sector** demonstrates leadership by adopting greater energy efficiency and renewable energy.
4. **Market participants** encourage the development and adoption of energy efficient and renewable energy products and services.

## The three priority areas

The Strategy focuses on three priority areas to achieve its goal and objectives.



Government actions that support each priority area are outlined in the next section.

### 1. Renewable and efficient use of process heat

**Target:** *Decrease in industrial emissions intensity of one per cent per annum on average between 2017 and 2022*

Process heat is used in the industrial and commercial sectors to create steam, hot water or hot gases. For example, meat and dairy processors use steam from boilers to sanitise equipment and process raw products, such as milk into powder.

Process heat makes up one-third of New Zealand's overall energy use and contributes nine per cent of gross emissions. Sixty per cent of process heat is supplied using fossil fuels, mainly coal and gas. The industrial sector is the largest end-user of process heat – 80 per cent of total process heat use occurs in this sector.<sup>12</sup>

Process heat offers one of our largest cost-effective opportunities to improve energy efficiency and switch from fossil fuels to renewable energy.

It is estimated that the efficiency of the industrial sector's use of process heat could improve by four to 12 per cent between 2010 and 2030.<sup>13</sup> It could also play a significant role in meeting New Zealand's 2030 emissions reduction target, while helping industries to be more competitive and meet their productivity goals.

In the public sector, process heat is used in a number of ways including, to heat schools, universities, offices and other buildings, and create steam for sterilisation in hospitals. There are opportunities for local government to reduce emissions and offset other energy requirements by using new technologies to turn waste into energy at wastewater treatment facilities and landfills. Although public sector heat demand accounts for only 14 per cent of total use, demand is often located in communities, which can encourage local renewable heat markets to develop. Cost savings from process heat improvements in the public sector benefit New Zealanders by saving taxpayers' money.

## 2. Efficient and low emissions transport

**Target:** *Electric vehicles make up two per cent of the vehicle fleet by the end of 2021*

Transport accounts for around 36 per cent of New Zealand's energy use and 17 per cent of New Zealand's gross emissions.<sup>14</sup> Our transport system relies almost entirely on fossil fuels to power our cars, trucks, aircraft, rail networks and ships. Ninety per cent of transport energy is used in road transport. The fuel economy of vehicles entering our fleet is poor compared with other countries, and improvements in reported performance have stalled since 2013.<sup>15</sup>

New technology is creating opportunities for New Zealand to benefit from our high level of renewable electricity. This is already impacting on the design, operation and maintenance of transport infrastructure. It is essential that the regulatory environment enables the widespread introduction of new applications so the benefits of innovation can be realized.<sup>16</sup>

New Zealand's long, skinny geography and geographical isolation make our road transport system particularly important. Our growing population and economy are placing increased demands on this system. Although vehicles will become more efficient, there is a risk that efficiency increases will not be sufficient to offset increased emissions from transport in the future.

---

<sup>12</sup> Energy Efficiency and Conservation Authority (2016): Energy End Use Database accessible at [www.eeca.govt.nz/resources-and-tools/tools/energy-end-use-database/](http://www.eeca.govt.nz/resources-and-tools/tools/energy-end-use-database/).

<sup>13</sup> Source: Ministry of Business, Innovation & Employment and Energy Efficiency and Conservation Authority (2016): peer-reviewed by NZIER, scheduled for publication in early-2017. This is in addition to the 10 per cent efficiency gains expected to occur under business as usual.

<sup>14</sup> Source: Ministry for the Environment (2016): Greenhouse Gas Inventory 1990-2014.

<sup>15</sup> Vehicle choices that consumers and importers are making are tending to favour larger vehicles.

<sup>16</sup> As outlined in the National Infrastructure Plan (2015).

### **Passenger transport**

There is scope for New Zealand to improve the energy productivity of passenger transport more quickly by taking steps to promote more efficient internal combustion engines, electric vehicles and other transport electrification. In addition, use of technology to build intelligent transport systems (ITS) and innovative spatial planning approaches (e.g. building around transport hubs) will reduce the need for private vehicles.

### **Freight transport**

We need an efficient freight network with policy and regulatory settings to support growth, optimise the performance of the freight network and continue achieving productivity gains in the freight transport sector.<sup>17</sup>

A highly competitive freight industry, increasing population growth and consumer expectations for rapid delivery of goods means that freight services and associated emissions are expected to grow steadily. New Zealand's freight task (volume of freight (tonnes), and how far it moves (kilometres)) is projected to increase by 48 per cent between 2014 and 2042.<sup>18</sup>

There is significant potential to improve our use of existing infrastructure through the efficient management of our heavy vehicle fleet, to tap into the potential energy savings. This improvement could involve investing in more efficient fleets and supporting changes in the behaviour of trucking firms, at both management and driver level. For example, trucks move freight more efficiently when they are carrying full loads.

## **3. Innovative and efficient use of electricity**

We already have a target to increase the level of renewable electricity to 90 per cent by 2025. Since this target was announced, the percentage of electricity generation has increased significantly, from 67 per cent in 2007 to 81 per cent in 2015. While we are well ahead of other countries in this respect, our energy productivity improvement has been slipping behind some other OECD countries.

Electricity efficiency helps to build a more competitive and productive economy by enabling individuals and businesses to get more value and benefit from the energy they use. This frees up money for other purposes. Smarter energy use in buildings and more efficient products and appliances could deliver electricity savings for businesses and households.

This is significant to New Zealand as many of our key exports are energy-intensive to produce. To remain competitive, it is important that we manage and reduce energy use and costs. Our challenge is to use our renewable electricity supply more productively so that our industries become amongst the least energy and carbon intensive in the world. International<sup>19</sup> and domestic<sup>20</sup> experience shows electricity efficiency investments can also lead to product quality improvements, reduced operating and maintenance costs and improved working conditions.

---

<sup>17</sup> As outlined in the National Infrastructure Plan (2015).

<sup>18</sup> Ministry of Transport (2014). National Freight Demand Study.

<sup>19</sup> Where the monetised values from these multiple benefits are included, the payback periods of energy efficiency investments are typically halved. Source: International Energy Agency (2014): Capturing the Multiple Benefits of Energy Efficiency. OECD/IEA: Paris.

<sup>20</sup> EECA works with many of New Zealand's largest energy users. Case studies demonstrating these benefits can be found at [www.eecabusiness.govt.nz/resources-and-tools/case-studies/](http://www.eecabusiness.govt.nz/resources-and-tools/case-studies/).

Exciting new technologies are starting to give businesses and individuals more choice and control over how and when they use, and even produce, electricity. Technologies such as heat pumps, energy efficient lighting, smart metering and intelligent energy management systems (e.g. internet-connected appliances and devices) make it easier for businesses and individuals to manage and use electricity more efficiently, and can help to promote energy conservation.

Other technologies, such as electric vehicles, solar panels and battery storage provide new opportunities to make use of renewable resources. This includes electrification of sectors that have, to date, relied on fossil fuels (e.g. from internal combustion engines to electric vehicles in the transport sector and substituting coal and gas use for electric technologies in the manufacturing sector). The target to increase the number of electric vehicles reflects this potential to make more of our renewable electricity advantage.

## What actions can we take?

Energy efficient choices should ideally be enabled by well-functioning markets where incentives are clear and efficient, information is readily available, and competition and innovation are strong. However, where markets fail or face barriers, other measures may be required to realise the potential national benefits. This Strategy aims to foster productivity and renewables investment by removing any barriers and supporting innovation within competitive markets.

These actions provide a starting point for key groups wanting to work with government to build an energy efficient, productive and low emissions economy.

## Businesses

***Strategy Objective:*** *Businesses make energy efficient and renewable energy investments and adopt best practice energy management*

As significant energy users, businesses play a core role in driving technology adoption and demonstrating that efficient energy use can deliver substantial benefits to their bottom-line. New Zealand industries face intense competitive pressure and many exporters operate within tight margins. More efficient use of energy is an investment in future profitability and competitiveness.

Businesses are responsible for around two-thirds of New Zealand's energy use and associated emissions. Most businesses can improve their energy productivity by up to 20 per cent through smarter energy use and investment in efficient technology.<sup>21</sup> Businesses can also reduce their carbon footprint by converting to renewable energy sources such as woody biomass, efficient electricity and geothermal.

With the right investment planning and tools, energy is one of the few costs that businesses can control. Increasing the number of businesses that prioritise energy productivity and the use of renewable energy will deliver benefits both for those firms and to the New Zealand economy.














---

<sup>21</sup> Source: EECA business website [www.eecabusiness.govt.nz/](http://www.eecabusiness.govt.nz/).

There are a number of ways that businesses can take action, including:

Industrial businesses can:	Commercial businesses can:	Freight businesses can:
<ul style="list-style-type: none"> <li>• Adopt energy management systems and implement cost-effective projects.</li> <li>• Switch to lower carbon fuels, such as wood, electricity, or geothermal.</li> </ul>	<ul style="list-style-type: none"> <li>• Employ a building management system.</li> <li>• Choose a more efficient vehicle fleet and improve fleet management practices.</li> </ul>	<ul style="list-style-type: none"> <li>• Adopt best practice fleet management practices.</li> <li>• Purchase more efficient vehicles, including electric vehicles.</li> <li>• Adopt lower emissions fuels.</li> </ul>

To enable and foster businesses to take action, the government will:

Supporting actions			
Implement the Electric Vehicles Programme to double the number of electric vehicle registrations each year to reach 64,000 by 2021			
Existing	MOT, EECA, NZTA		
Build on the government's guidance and mechanisms for businesses voluntarily reporting greenhouse gas emissions <sup>22</sup>			
Existing	MfE, MBIE, EECA		
Consider and introduce means to support continuous improvement in the energy performance of commercial buildings			
Existing - extension	EECA, MBIE		
Refocus EECA's business and freight programmes towards emissions and productivity opportunities in process heat and transport			
Existing - extension	EECA, MOT		
Explore options for how we can increase efficient driving practices and the pace of adoption of more fuel efficient vehicles (including EVs) by businesses			
Existing - extension	MOT, EECA		
Develop and implement a Process Heat Action Plan, with policies and programmes to improve efficiency of existing process heat plant, and encourage investment in efficient and renewable plant			
New	MBIE, EECA		
Explore options for the accelerated uptake of more energy efficient and intelligent land transport technology (e.g. Smart Traffic Management)			
New	MOT		

<sup>22</sup> Guidance on voluntary greenhouse gas reporting, accessible at [www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/voluntary-corporate-greenhouse-gas-reporting](http://www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/voluntary-corporate-greenhouse-gas-reporting).

## Individuals

**Strategy Objective:** *Individuals choose energy efficient technologies, adopt energy efficient behaviours and make greater use of renewable energy*

Individuals represent around one-third of New Zealand’s energy use, primarily due to private transport and residential use. Individuals have the potential to improve their energy efficiency by over 20 per cent by taking a range of actions in the home, when they are out and about and in their communities.

Individuals on their own, and also collectively as households, neighbourhoods, school groups, marae, churches and other communities, have the power to choose energy efficient technologies, adopt energy efficient behaviours and make greater use of renewable energy.











In doing so, they can save money on their energy bills and on fuel costs, have warmer and healthier homes and improve wellbeing through active transport. Improvements to the warmth and dryness of homes have been linked to productivity improvements because they reduce the number of days off work and school. This means that collectively, the actions of individuals are vital to New Zealand’s economic performance and progress, and health outcomes. New technologies can also help to promote energy conservation, while improving energy efficiency.

There are a number of ways that individuals can take action, including:

In the home:	Out and about:	In the community:
<ul style="list-style-type: none"> <li>• Adopt energy efficient behaviours.</li> <li>• Improve the warmth and energy performance of their home (e.g. insulation, draught-stopping, double glazing).<sup>23</sup></li> <li>• Purchase efficient lighting, appliances, water heating and space heating equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• Practice efficient driving.</li> <li>• Purchase a more efficient vehicle, including electric vehicles.</li> <li>• Use a ridesharing scheme.</li> <li>• Shift to public or active transport (e.g. walking or cycling).</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake energy efficiency and renewable energy projects in schools, recreational facilities, marae and other community organisations.</li> <li>• Participate in initiatives such as Project Litefoot, Enviroschools and programmes run by charitable trusts.</li> </ul>

<sup>23</sup> This includes rental homes and actions landlords could take to improve the energy efficiency, thermal performance and value of their rental properties.

To enable and foster individuals to take action, the government will:

<b>Supporting actions</b>			
Continue to provide information, advice and technical assistance to individuals on energy efficient and renewable energy technologies and practices, including advice on reducing costs and emissions <b>Existing</b>	EECA		
Introduce new and periodically review minimum energy performance standards and labels for appliances, equipment and vehicles to ensure that potential consumers are provided with clear and accurate energy information at the point of sale <b>Existing</b>	EECA		
Implement the Electric Vehicles programme to increase awareness of the benefits of electric vehicles and accelerate uptake through collaboration with the private sector to aggregate demand and increase model availability and affordability <b>Existing</b>	MOT, EECA		
Implement recent changes to the Residential Tenancies Act requiring landlords to insulate residential rental homes <sup>24</sup> <b>Existing</b>	MBIE		
Implement EECA's Warm Up New Zealand Healthy Homes Rental programme through to June 2018 <b>Existing</b>	MBIE, EECA		
Develop approaches to continue to improve consumer access to energy information (including real-time) and leverage intelligent energy management technologies <b>Existing - extension</b>	EECA, MBIE, EA (support)		
Support continuous improvement in the energy performance of new and existing homes through scheduled reviews of the building code and by increasing energy efficiency performance requirements over time <b>Existing - extension</b>	MBIE, EECA		
Explore options for how we can increase efficient driving practices and the pace of adoption of more fuel efficient vehicles (including EVs) by households <b>Existing - extension</b>	MOT, EECA		

## Public Sector agencies

**Strategy Objective:** *The public sector demonstrates leadership by adopting greater energy efficiency and renewable energy*











The public sector is made up of central government and local government agencies, schools, universities, hospitals, prisons, wastewater facilities, landfills and other publicly owned buildings. Energy used by public sector agencies makes up seven per cent of New Zealand's total energy use.

<sup>24</sup> Social housing (where tenants pay an income related rent) must be insulated by 1 July 2016 and all other rental homes by July 2019. See more at [www.tenancy.govt.nz/about-tenancy-services/news/law-changes-to-the-residential-tenancies-act/](http://www.tenancy.govt.nz/about-tenancy-services/news/law-changes-to-the-residential-tenancies-act/).

The public sector can play a leadership role by directly reducing energy use and emissions, and incentivising wider action. Examples of actions that the public sector can take include using renewable energy to heat schools and universities, local councils using municipal solid waste and gas as energy sources, or improving energy performance by retrofitting existing buildings or through new builds.

Central government can help co-ordinate diverse players and share best practices in order to encourage other public sector agencies to take action. Some councils, district health boards, universities and collaborating businesses are already demonstrating innovative ways to use renewable sources of process heat. The location of this heat demand in local communities can boost regional economic development and reduce coal use. Examples of renewable energy use in local communities include the Rotorua and Dunedin wood energy collectives, and the new six megawatt boiler at Burwood Hospital powered entirely by wood waste residues.

To enable and foster public sector agencies to take action, central government will:

<b>Supporting actions</b>			
Consider how public sector agencies can implement procurement policies that take into account life-cycle costs of products and services			
Existing	MBIE		
Build on the government’s guidance and mechanisms for voluntary reporting of greenhouse gas emissions, including the role of public sector agencies.			
Existing	MfE, MBIE, EECA		
Refocus EECA’s Crown Loans programme towards opportunities to reduce carbon emissions and leverage EECA’s technical expertise to deliver economic and emissions benefits to New Zealand over the longer-term			
Existing - extension	EECA		
Increase the number of public sector agencies that have NABERSNZ <sup>25</sup> ratings and that are implementing building energy performance improvement projects			
Existing - extension	EECA		
As part of the Process Heat Action Plan, identify opportunities to increase public sector energy efficiency and renewable energy use in publicly-owned boilers			
New	MBIE, EECA, MfE		

## Cross-cutting actions

**Strategy Objective:** Market participants encourage the development and adoption of energy efficient and renewable energy products and services

This objective reflects the opportunities that require market participants to work together to achieve the Strategy’s goal, recognising that responsibility for delivering actions is often shared.

<sup>25</sup> NABERSNZ (based on the National Australian Built Environment Rating System) is an independent tool for rating the energy efficiency of office building, backed by the New Zealand government. NABERSNZ programme helps ensure buildings are performing at a high standard.















Efforts to improve our energy productivity and move to a low emissions economy provide national benefits for New Zealand. However, energy efficiency is more difficult to measure than energy consumption, is fragmented across the economy (as millions of devices and buildings contribute to it), and is rarely the primary focus for a business, agency or individual.

Consequently, energy efficiency has traditionally been undervalued relative to other investment options. Low emissions technologies also suffer from a lack of investment relative to existing energy technologies, and they tend to be perceived as more risky. These issues can create a lack of trusted information and the skills and expertise needed to realise the potential benefits.

In order to ensure New Zealanders gain access to cutting edge technologies and achieve a more energy efficient, productive and low emissions New Zealand, we need to innovate and build capability. Low investment in energy efficiency creates an absence of qualified energy efficiency experts and technicians resulting in an underdeveloped energy efficiency services market.

To enable and foster coordinated actions across all four priority areas, the government will:

<b>Supporting actions</b>			
Develop methods and guides to help businesses, individuals and other organisations quantify and monetise the multiple benefits of energy productivity and renewable energy			
Existing	MBIE, EECA		
Support skills development in the energy management and renewable energy fields, in partnership with relevant tertiary and research institutions, and the business community			
Existing	MBIE, EECA		
Support increased investment in energy research, development, and demonstration (RD&D) to help foster innovation in the development and deployment of next generation technologies and ensure future productivity gains			
Existing	MBIE, Callaghan Innovation, EECA		
Continue to build on the contribution that renewable energy and energy efficiency expertise make to New Zealand’s international connections, and ensure that the supporting data and research is up-to-date and relevant			
Existing	MBIE		

## How will we track progress?

### Targets

The government is developing energy targets to signal the longer-term direction for the sector, focusing on opportunities to increase the use of renewables and improve energy productivity. Those targets will sit above the targets in this Strategy. The government already has a target to increase the level of renewable electricity to 90 per cent by 2025.

Under this Strategy, we have identified targets and measures which can be used to track the impact of actions set out in the previous section. These targets sit under the priority areas and are set at a level which will help ensure that our policies remain relevant and are achieving the desired goal.

With a growing international focus on emissions reduction and rapid change in energy technologies and use, these two sets of targets (long-term energy targets and the targets set under this Strategy) will provide a clear and aspirational direction for the energy sector and economy.

The targets under this Strategy are:

1. **Decrease in industrial emissions intensity (kg CO<sub>2</sub>-e/\$ Real GDP) of one per cent per annum on average between 2017 and 2022** (*new*).
2. **Electric vehicles make up two per cent of the vehicle fleet by the end of 2021** (*existing under the EVs Programme*).

#### ***Process heat target***

The target to decrease industrial emissions intensity related to the process heat priority area, and takes account of both renewable and energy productivity potential. The target measures emissions intensity (CO<sub>2</sub>-e divided by Real Gross Domestic Product (GDP)) for selected industries,<sup>26</sup> recognising that the industrial sector accounts for a significant portion of process heat demand (combustion of fuel for heat use by industry).

The target level has been developed using MBIE and Statistics New Zealand data, and will be supported through the development of a Process Heat Action Plan, which will draw on the lessons from EECA's recent carbon pilot programmes (Wood Energy South and Lower Carbon Meat and Dairy).

#### ***Transport target***

The second target relates to the transport priority area and was set in March 2016 as part of the package of measures to encourage the uptake of EVs. To achieve the target, EV registrations will need to double each year until 2021, which will result in around 64,000 EVs (based on current estimates). This is an ambitious, but reasonable target given expected changes in technology and the expected impact of the EVs Programme. The EVs target complements New Zealand's existing advantage in renewable electricity.

#### ***Electricity target***

Electricity continues to be a priority area under the draft NZEECS, with a particular focus on supporting technology uptake and innovation. This reflects the changing energy context and government's role in enabling market-led action, which benefits households and businesses (while maintaining energy security). In the residential sector the electricity demand per household has fallen since 2010. However, it is difficult to determine how much of the change in electricity demand is due to efficiency measures and how much is due to other factors.

---

<sup>26</sup> Chemicals, metals and electricity generation are excluded as these include very large firms which would make the measure less useful or are not relevant to what is being targeted by the Strategy. A factsheet with further information on this target is available on the NZEECS consultation webpage.

There are a number of contributing factors which make forecasting problematic, particularly over a short time.<sup>27</sup>

Some emissions reduction in the New Zealand electricity sector can be supported through smart grid developments. However, the Smart Grid Forum<sup>28</sup> concluded that New Zealand's electricity market is already well placed to support smart grid development and that specific market interventions, seen internationally, have resulted in negative consequences that we have done well to avoid. Based on this finding, setting a prescriptive target relating to smart grid development or new technology uptake is not recommended as part of this Strategy.

The existing renewable electricity target of 90 per cent by 2025 (as set out in the New Zealand Energy Strategy 2011-2021) sets an aspirational target without being prescriptive to any technology. This target is well-known and enduring, and continues to set the direction for investment in this sector.

Having a mix of new and existing targets reflects the need to provide clear direction for future policy and action, while taking into account the expected changes in the economics of energy technologies and practices. Achieving these targets will require government, businesses, individuals and market participants to work together to develop the right mix of new policies and programmes to fully realise the opportunities that exist.

## Governance

Alongside this, the lead agencies identified in the Strategy will be required to develop appropriate policy measures that contribute to the realisation of the targets and objectives. Existing measures will also contribute to the realisation of the targets and objectives (e.g. implementation of the insulation amendment in the Residential Tenancy Agreement).

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.

This Strategy builds on achievements to date and does not include a full list of government energy efficiency and renewable initiatives. This approach will ensure the document stays relevant for its five-year life, and allows for initiatives to end and new programmes to begin. The full range of initiatives is listed by public sector agencies in their respective public accountability documents and websites.

Supporting the Government's approach will be investment in quality energy end-use data and analysis. Good data is critical for reviewing existing programmes and informing new policy design. Data will continue to be published by MBIE, Statistics NZ, the Electricity Authority, the Gas Industry Company, the Ministry of Transport and EECA.

---

<sup>27</sup> These include: temperature increases; higher population growth in warmer regions with lower heating requirements; changing household composition; a shift to more efficient appliances and lighting; improving home insulation; improved building standards; and, changing affordability of electricity for households.

<sup>28</sup> Smart Grid Forum (August 2016) *Relative progress of smart grid development in New Zealand*.

## Glossary

Term	Meaning
Energy productivity	The value we get from our energy, defined as Gross Domestic Product (GDP) per unit of energy used (refer Energy Intensity).
Energy intensity	Energy intensity compares production in the economy, as measured by real GDP, with total energy demand, as measured by total consumer energy. It determines whether our reliance on energy to generate economic growth is increasing or decreasing.
Energy efficiency	Something is more energy efficient if it delivers more services for the same energy input, or the same services for less energy input. For example, when a compact florescent light (CFL) bulb uses less energy than an incandescent bulb to produce the same amount of light, the CFL is considered to be more energy efficient.
Gross emissions	Gross emissions come from the agriculture, energy, industrial processes and product use, and waste sectors. They do not include emissions and removals from land use, land-use change and forestry.
Energy emissions	Greenhouse gas emissions (GHG) from the energy sector, including the production and use of energy (i.e. does not include GHG emissions from agriculture or any other sector apart from those that are energy-related).
Intelligent transport systems (ITS)	Intelligent Transport Systems (ITS) are those in which information, data processing, communication, and sensor technologies are applied to vehicles, infrastructure and transport users. In general, they can be categorised into three major areas: 1) vehicle systems; 2) traffic management systems; 3) travel information systems. ITS technologies increase the efficiency of the transport system and offer benefits in reducing congestion, fuel consumption, delays and emissions. ITS can play a role in reducing emissions by affecting the road traffic conditions and the dynamics of driving (Ministry of Transport definition).
National transport	Emissions from the combustion and evaporation of fuel for all transport activity, regardless of the sector (excludes international transport). <a href="http://unfccc.int/ghg_data/online_help/definitions/items/3817.php">http://unfccc.int/ghg_data/online_help/definitions/items/3817.php</a>
Process heat	Process heat is energy used for commercial processes, manufacturing or heating; it is often generated by boilers. The heat is then used by businesses for a wide variety of applications such as timber processing and paper-making, food processing or milk drying. Emissions from heat energy are direct emissions from combustion of fuels (e.g. coal used in a boiler).
Electricity generation and consumption	Emissions from the combustion and evaporation of fuel where the primary purpose is to generate electricity.
Emissions intensity	Greenhouse gas emissions intensity compares production in the economy, as measured by real GDP, with gross greenhouse gas emissions. It measures whether emissions have grown or decreased faster or slower than growth in the economy.



Energy Efficiency and  
Conservation Authority  
Te Tari Tiaki Pūngao

DRAFT NEW ZEALAND ENERGY EFFICIENCY  
AND CONSERVATION STRATEGY 2017-2022



**MINISTRY OF BUSINESS,  
INNOVATION & EMPLOYMENT**  
HĪKINA WHAKATUTUKI

[New Zealand Government](#)