

# Energy Use Survey: Primary sector 2011

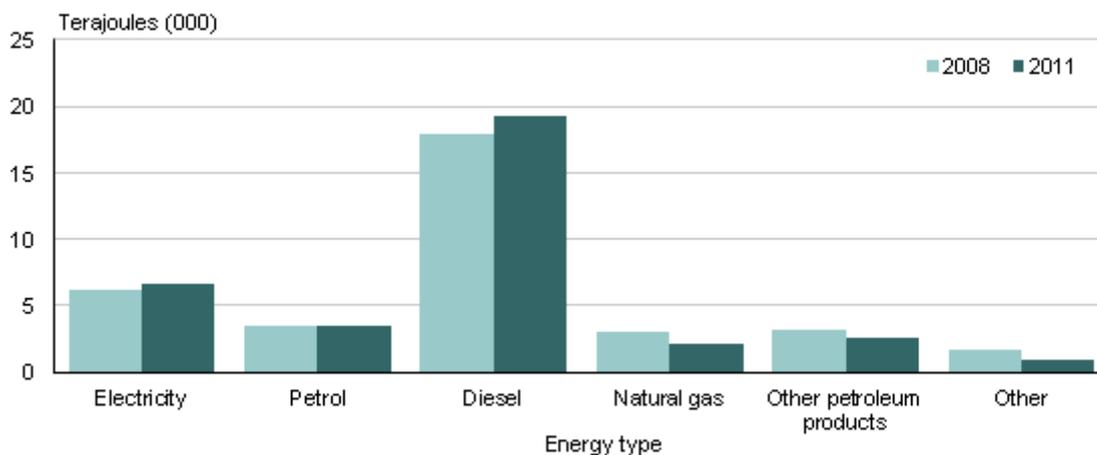
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## Key facts

In 2011:

- Total energy use for the primary sector was 35,000 terajoules (TJ), similar to 2008.
- Diesel was the most important energy type for the primary sector, providing half its energy needs.
- Two thirds of primary sector diesel is used off public roads, such as on farms, fields, and around mines.
- Half of all primary sector businesses have energy saving initiatives in place, with energy monitoring and installing energy saving technologies being the most common.
- The primary sector uses less than one tenth of the energy consumed by all businesses in New Zealand.

**Primary sector energy use by energy type**  
2008 and 2011



Source: Statistics New Zealand

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## Commentary

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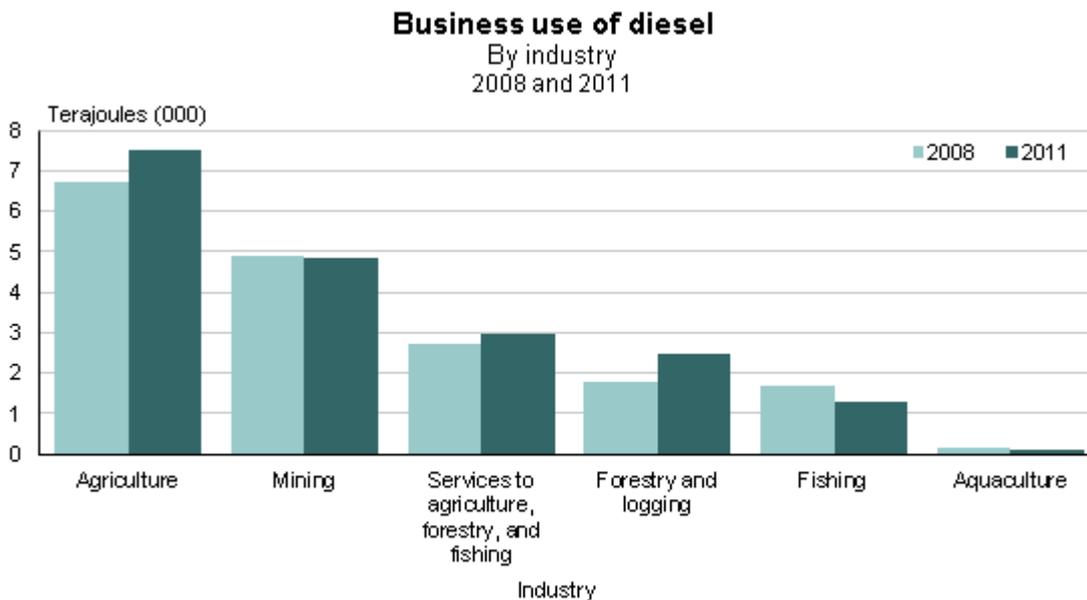
## Overview

These results provide data on the energy use by the primary sector during 2011. This sector has been surveyed as part of a three-year cycle covering all industries. This year is the first in the second cycle. This allows comparison between the reported energy use by the same sector three years ago, as well as comparisons to the other two sectors. The table below shows how the collection is broken down.

	Primary sector	Industrial and trade sector	Services sector
Inaugural cycle	2008	2009	2010
Current cycle	2011	2012	2013

## Diesel keeps the wheels turning for agriculture, and forestry and logging

Diesel is by far the most important energy type for the primary sector, making up half its energy requirements. The total diesel used by the primary sector in 2011 was approximately 500 million litres, or 19,000TJ. This was almost 7 percent more than in 2008. The largest contributors to the increase were agriculture, and forestry and logging.



Source: Statistics New Zealand

The agriculture industry is the biggest consumer of diesel in the primary sector, making up just under 40 percent of the sector’s diesel use. This was a 12 percent increase compared with 2008. A number of factors may explain this. Pastoral and dairy product export volumes increased 16 percent. While individual business use is relatively small, the sheer number of farms makes the industry the largest overall user in this sector.

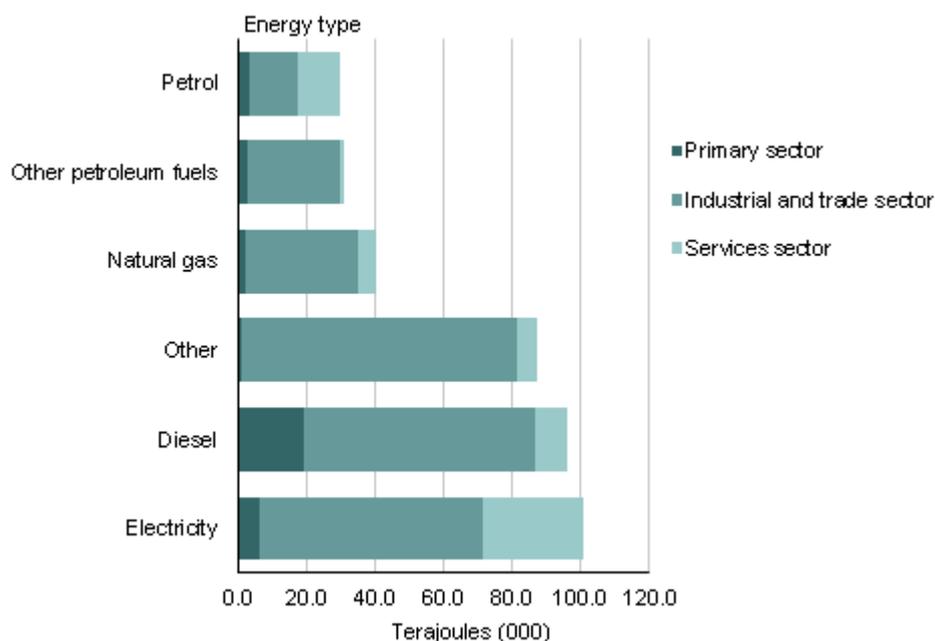
Forestry and logging had a marked increase in diesel use, rising almost one-third in three years. While the total number of businesses remained static, export trade data suggests greater activity in this industry. Between 2008 and 2011 forestry export volumes increased 25 percent.

Each business in the primary sector used an average of 7,500 litres of diesel in 2011, which was 250 litres more per business than in 2008.

## Primary sector a small energy user

In terms of total energy, the primary sector is a small user. It makes up about 15 percent of businesses but uses only one-tenth of the energy consumed by all businesses in New Zealand. The largest consumer is the industrial and trade sector, which includes manufacturing, transport, and construction industries. It consumes over two-thirds of all business energy use.

**Estimated annual energy use by energy type across all sectors**  
2009–11



Source: Statistics New Zealand

The three main fuel types used across all sectors are electricity, diesel, and other (coal and wood). Diesel is by far the most important energy type for the primary sector, but not for the industrial and trade, or services sectors. For these sectors, diesel fulfils around 20 percent of their energy requirements.

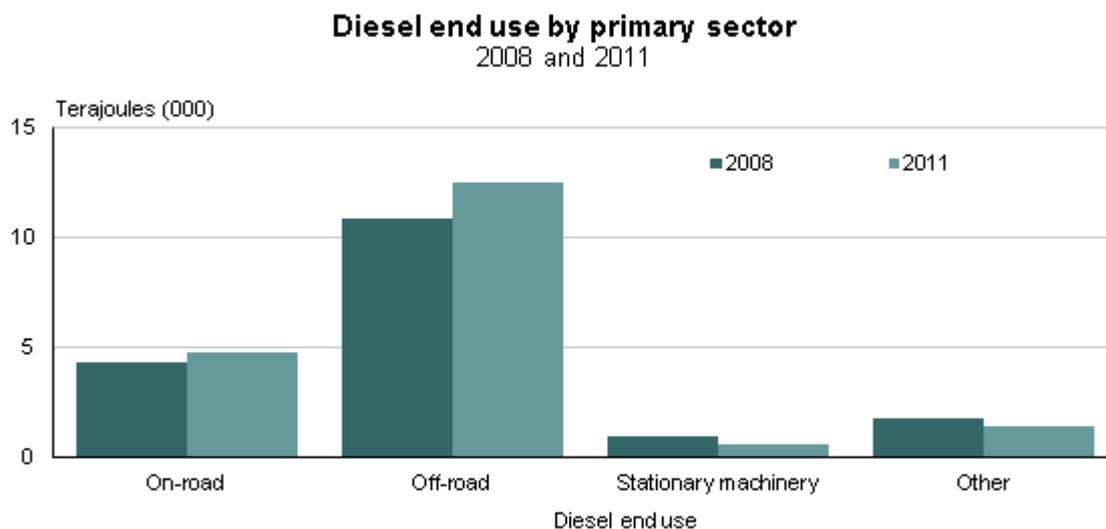
The ratio of different energy types in the three sectors varies. The industrial and trade sector uses a large percent of the country’s natural gas and other energy types (eg coal). This is because they are used as energy input sources for manufacturing processes. These energy types are not as suited to activities in the primary sector, with the exception of natural gas which is used by the mining industry.

The services sector uses more petrol and electricity than any of the other energy types. This is because their primary needs are petrol for vehicles, and electricity for lighting, appliance, and computer use.

## Diesel driving primary sector off-road

In 2011, the primary sector used about enough diesel to make 2 million trips from Cape Reinga to Bluff in a medium-sized diesel car. However two thirds of this was actually for use off public roads: for example, on farms, fields, and in mines.

The overall increase in diesel consumption came from off-road use in agriculture, and forestry and logging industries, which are industries more inclined to use vehicles in paddocks and fields.



Source: Statistics New Zealand

The 'other' use is largely marine use. For the primary sector the major user is the fishing industry.

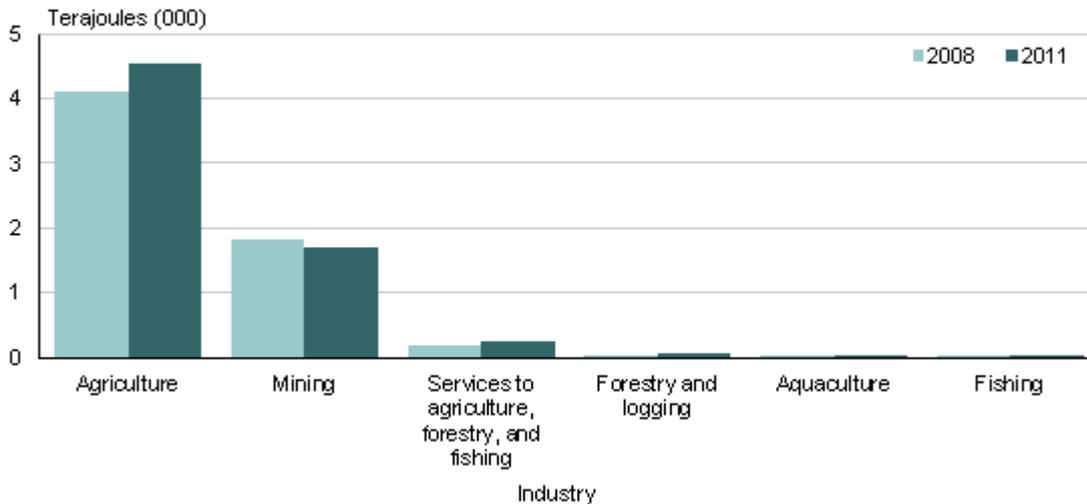
A drop in the energy used by the fishing industry can be seen since the previous survey of the industry's energy use. Between 2008 and 2011, total energy use by the finishing industry dropped from 3,667 TJ to 3,177 TJ, a drop of 15 percent. Two-thirds of businesses in this industry indicated that they undertook some energy saving initiatives. Some changes in fleet make-up were also behind part of the drop.

## Agriculture primary user of electricity in sector

The total electricity use by the primary sector was 6,600 TJ. This was an increase of over 6 percent compared with 2008. This is driven by increases in the agriculture industry, which is responsible for over two-thirds of the electricity use in this sector.

## Business use of electricity

By industry  
2008 and 2011



Source: Statistics New Zealand

Other primary sector industries are all low users of electricity, the majority of their energy coming from liquid fuels.

### Primary motivators in energy savings

Responses to questions on initiatives to save energy show that primary sector businesses are pro-active. Well over half of businesses have some initiative in place. Common initiatives included installing energy saving technologies (28 percent) and providing information on energy saving to staff (18 percent). However, monitoring energy use remained the most common energy saving initiative (40 percent) in 2011, as it was in 2008.

These initiatives may indeed be having an effect as the industries with the highest rates of energy management initiatives were also the same ones where decreases in energy use were seen: in the fishing and mining industries.

Unsurprisingly, the main motivators for energy use reduction are bottom-line based: both increasing energy efficiency and reducing cost were rated as the important. This held true for nearly two-thirds of all surveyed businesses.

For more detailed data, see the Excel tables in the 'Downloads' box.

## Definitions

### About the New Zealand Energy Use Survey

The New Zealand Energy Use Survey collects and publishes statistics about the energy used by three sectors of New Zealand economy – the primary, industrial and trade, and services sectors. Organisations provide information on how much energy they use, which allows us to publish data at industry and national levels for different energy types. The energy types include electricity, petrol, diesel, coal, natural gas, and renewable energy types.

### More definitions

**ANZSIC06:** Australian and New Zealand Standard Industrial Classification 2006.

**Business Frame:** A register of all economically significant units operating in New Zealand.

**Economically significant:** An economically significant organisation meets at least one of these criteria:

- has greater than \$30,000 annual GST expenses or sales
- 12-month rolling mean employee count of greater than three
- is part of a group of enterprises
- is registered for GST and involved in agriculture and forestry
- over \$40,000 of income recorded in the IR10 annual tax return (this includes some units in residential property leasing and rental).

**Enterprise:** A unit or business entity operating in New Zealand. It can be a company, partnership, trust, estate, incorporated society, producer board, local or central government organisation, voluntary organisation, or self-employed individual.

**Kind-of-activity unit:** A subdivision of an enterprise engaged in predominantly one activity and for which a single set of accounting records is available.

**Rolling mean employment (RME):** A 12-month moving average of the monthly employee count (EC) figure. The EC is obtained from taxation data.

**Calorific value:** The energy contained in a fuel, determined by measuring the heat produced by the complete combustion of a specified quantity of it. Different values were used to convert different energy types into comparable units (MJ).

**Joule (J):** A unit for measuring energy. The main unit used in the release is the terajoule where 1TJ is approximately equal to the total electricity used by 35 households in one year.

Name	Symbol	Multiple
Joule	J	1J
Kilojoule	kJ	10 <sup>3</sup> J
Megajoule	MJ	10 <sup>6</sup> J
Gigajoule	GJ	10 <sup>9</sup> J
Terajoule	TJ	10 <sup>12</sup> J
Petajoule	PJ	10 <sup>15</sup> J

## **Related links**

### **Upcoming releases**

New Zealand's *Energy Use Survey: 2012* figures will be released in October 2013.

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The [release calendar](#) lists all our upcoming information releases by date of release.

### **Past releases**

See [New Zealand Energy Use Survey – Information releases](#) for more information on our previous releases.

### **Related information**

See [Information about the survey](#) for a detailed description of New Zealand Energy Use Survey.

See [Questionnaires and forms](#) for the questionnaire sent to respondents.

[Energy Efficiency and Conservation Authority](#) – provides information on understanding and overcoming the barriers to being more energy efficient and using more renewable energy.

[Ministry of Economic Development - Energy Data](#) – provides information on supply and demand of energy by fuel types, pricing information and energy balance tables.

[BRANZ - Building Energy End-use Survey](#) – The BEES study, undertaken by BRANZ, monitors and analyses energy (and water) use within entire non-residential buildings. This differs from the Energy Use Survey, which analyses energy use by entire organisations (which may be spread over several buildings, or may be sharing a building).

[Christchurch Agency for Energy](#) – CAfE was set up to analyse energy use in Christchurch, and introduce energy saving and sustainability initiatives. CAfE has some data related to the 2010/11 Canterbury earthquakes and energy use through that time. Data collected for the Energy Use Survey does not provide accurate regional estimates, and due to the timing of the collection may not include energy use at the time of the earthquakes.

## Data quality

The data quality section provides period-specific and general information about the data.

### Period-specific information

This section has information about data that has changed since the last release.

- [Relevance of the data](#)
- [Accuracy of the data](#)
  - [Response rate](#)
  - [Measurement errors](#)
  - [Sampling error for 2011 survey](#)
  - [How to read sampling errors](#)
  - [Target population](#)
  - [Survey population](#)

### General Information

This section contains information about data that does not change between releases.

- [Data source](#)
- [Survey population](#)
- [Sample design](#)
- [Measurement errors](#)
- [Non-response and imputation](#)
- [Energy units standardised](#)
- [More information](#)

## Period-specific information

### Relevance of the data

The survey was posted out in April 2012, with a reference period of the last financial year for which the unit had results available in May 2012. The majority of respondents had a 31 March 2012 balance date. However a number of respondents had either a June 2011 or December 2011 balance date. A small number stated other dates. No adjustment has been made to produce figures for a single consistent time period for all units.

### Accuracy of the data

#### Response rate

The survey was sent to just over 4,000 units and the required overall response rate was 80 percent. The response rate achieved was 81.6 percent. The response rate achieved for key units was 100 percent, which met the target 100 percent.

## Measurement errors

The survey results are subject to measurement errors, including both non-sample and sample errors. These errors should be considered when analysing results.

### Sampling error for 2011 survey

The sample design for the Energy Use Survey: Primary sector 2011 aimed to control and reduce the relative sampling errors (RSEs), specifically for key energy types. These energy types were:

- total energy use in each industry
- electricity use in each industry
- combined petrol and diesel use in each industry.

### How to read the sampling errors

Sampling errors for this survey were calculated using the RSE measures. RSEs are the sampling error as a percentage of the estimate. The sampling errors are estimates at the 95 percent confidence level. For example, the estimated energy use by the total Primary sector for 2011 is 35,000 TJ. This estimate is subject to an RSE estimate of approximately 3.97. This means that 95 percent of the possible samples of the same size will produce an estimate between 35,000 - 1,400 and 35,000 + 1,400; that is, between 33,600 TJ and 36,400 TJ.

The following table shows the actual RSEs for each industry in the 2011 survey.

<b>Relative sampling errors (RSEs) by industry</b>	
Industry	Final RSE for total energy use (%)
Agriculture	6.14
Forestry and logging	10.58
Aquaculture	10.30
Fishing	3.90
Services to agriculture, forestry, and fishing	10.93
Mining	8.95
Total primary sector	3.97

### Target population

The 2011 survey covered the following primary industries of New Zealand's economy:

- agriculture
- forestry and logging
- aquaculture
- fishing
- services to agriculture, forestry, and fishing  
mining.

The target population included all economically significant units in the Australian and New Zealand Standard Industrial Classification 2006 (ANZSIC06) categories A and B that were live at the time of selection.

## Survey population

The collection unit for the survey is the kind-of-activity (KAU). Altogether, 66,663 enterprises had KAUs that meet the requirements above for the 2011 collection.

The survey sample was designed to produce results for the industries listed under target population.

## General information

### Data source

The New Zealand Energy Use Statistics Programme is a product of the [Energy Domain Plan](#) that was published in 2006. The Energy Domain Plan was produced by Statistics NZ in collaboration with the Energy Efficiency and Conservation Authority (EECA), and the Ministry of Economic Development (MED). The domain plan identified energy use statistics as a key gap in energy information and prioritised a suite of energy use surveys.

The Energy Use Survey delivers information to help fill gaps in current energy statistics and provides a benchmark of energy use information for New Zealand's economy, excluding households. Data from the survey will also feed into modelling systems that give current energy-use estimations and future demand forecasts. Modelling assumptions can then be updated, which will improve the accuracy of modelled information.

### Survey population

The KAU was chosen as the selection unit to allow the uses of energy to be associated with an activity as closely as possible. KAU data allows energy use to be separated for larger units with multiple branches involved in different activities (multi-KAU).

### Sample design

The sample design was a two-way, one-stage stratified random sample. The stratification and design variables were ANZSIC06, GST sales, and rolling mean employment.

The 2011 survey collected information from New Zealand's primary sector on the following commodities:

- electricity – all electricity purchased from the national grid and energy sources used for input to electricity generation and cogeneration
- electricity generated in the unit – electricity generated within the operations of the unit (this figure is not included in the total energy used, to avoid double counting)
- petroleum products – energy products derived from the refining process of crude oil including:
  - petrol – an aggregated figure of 96 and 91 octane petrol
  - fuel oil – an aggregated figure of the major intermediate products, notably light fuel oil and heavy fuel oil
  - diesel
  - liquefied petroleum gas (LPG)
  - aviation fuel
- natural gas

- coal – including all ranks
- wood and wood waste – used for energy purposes.

The survey also collected information on energy management practices.

## **Measurement errors**

The survey results are subject to measurement errors, including both non-sample and sample errors. These errors should be considered when analysing results.

### **Sampling error**

Sampling error is a measure of the variability that occurs by chance because a sample, rather than the entire population, is surveyed. The level of sampling error for any given estimate depends on the number of sampled individuals, the variability of the estimate, and the sample size. Due to the random nature of the sample selection the error will differ for different samples.

### **Non-sampling errors**

Given the nature of the data collected, there are limitations on the level of accuracy that can be expected from the survey. Records may not be kept in the form required for the survey, some estimation by the respondent may be required and non-sampling error may occur. Non-sampling errors include mistakes by respondents when completing questionnaires, variation in the respondents' interpretation of the questions asked, and errors made during the processing of the data. Statistics NZ has extensive procedures to minimise these types of errors, but they may still occur and are not quantifiable.

## **Non-response and imputation**

### **Unit non-response**

Unit (or complete) non-response occurred when units in the sample did not return the questionnaire. The initial selection weight of the remaining units in the stratum adjusted to account for the unit non-response (no item non-response imputation would occur for the units that did not return the questionnaire).

### **Item non-response**

Item (or partial) non-response occurred when units return the questionnaire but some questions are not answered. Item non-response imputation was carried out for units that answered some but not all of the questions they were required to (based on questionnaire routing rules). Respondents who did not answer any of the questionnaire were classified as unit non-responses and the weights were adjusted accordingly. Item non-responses and the weights were adjusted accordingly. Item non-response was imputed for and the methods used are as follows:

### **Imputation of numeric variables**

The imputation method for numeric variables was random donor imputation. In this method, the responses of a randomly selected donor from within the same imputation cell as the non-respondent were imputed in the recipient unit. Donor imputation was used so that the distribution was maintained. Mean imputation was also used for some Agriculture units in the Dairy farming sub-industry to account for non-response due to sharemilking arrangements.

## Imputation of categoric variables

The imputation method for categoric variables was random donor imputation. The donor supplied responses for all categoric variables requiring imputation. If the donor unit did not respond to any of the variables requiring a response, then the next best donor was selected to supply this information. This was continued until all of the variables had a response.

## Special treatment

In 2011, 2.25% of units in the sample were specially treated (had their weights reduced to 1) because sufficient evidence was found that they were not representative of other units in the population.

In 2008, 3.25% of units in the sample were specially treated (had their weights reduced to 1) because sufficient evidence was found that they were not representative of other units in the population.

## Energy units standardised

Information on energy usage was collected in the unit that applies to each commodity; for example, litres for petrol and kilowatt hours (kWh) for electricity. These units were converted to a standard unit (joules) for reporting. This conversion enables the energy contained in different forms to be compared directly. The conversions were carried out by applying a calorific value (enthalpy value) to each energy type and form. The calorific values were sourced or derived from Ministry of Business, Innovation, and Employment (MBIE's) Energy Data File 2012. See the table below for the calorific values for each energy type.

<b>Energy types and their calorific values</b>		
Energy type	Details	Calorific value
Electricity	Electricity's standard universal unit, the watt, is defined as one joule per second	3.6 MJ per kWh
Petrol	Two main forms of petrol are in the market, regular and premium, and each has a slightly different conversion factor. The factor used in the Energy Use Survey is a weighted average of the two values, according to their current prevalence in the market	35.08 MJ per L
Fuel oil	There are two types of fuel oil: light fuel oil and heavy fuel oil. The conversion factor used in the Energy Use Survey was derived using a weighted average of the two, according to their current prevalence in the market.	40.7 MJ per L
Diesel	The value used is that of regular diesel	38.45 MJ per L
LPG	Liquid petroleum gas. LPG figures were provided in both litres and kilograms	49.51 MJ per kg 26.44 MJ per L
Aviation fuel	There are two major forms: jet fuel and aviation gasoline	34.55 MJ per L
Natural gas	Most natural gas figures were provided in joules, although some were in kilowatt hours	3.6 MJ per kWh
Coal	Bituminous	29,250 MJ per tonne
	Sub-bituminous	20,120 MJ per tonne

	Lignite	15,340 MJ per tonne
	Where the type was not known, the conversion factor was an average of the lignite, sub-bituminous and bituminous coal values	24,303 MJ per tonne
Wood and wood waste	Hog fuel or bark	9,060 MJ per tonne
	Sawmill residues of fuel wood	12,080 MJ per tonne
	Black liquor	10,500 MJ per tonne
	Joinery, building, or furniture residues	17,790 MJ per tonne
	Oven-dried wood	20,550 MJ per tonne
	The conversion factor where the wood type was not known was an average of the other types.	13,996 MJ per tonne

### More information

For more information see the [Energy Use Survey](#).

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## **Revisions**

The 2008 figures have been revised since being released in 2009. These revisions have been made because of better design data, increased knowledge and information about energy use in the sector after collecting this information for a second time, and more robust procedures in applying special treatment.

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## Tables

The following tables are available in Excel format from the 'Downloads' box. If you have problems viewing the files, see [opening files and PDFs](#).

1a	Energy use, by fuel type and industry, 2008–2011
1b	Energy use, by fuel type and industry, physical units, 2008–2011
2	Electricity end use, by industry, 2008–2011
3	Petrol purchasing, by industry, 2011
4	Petrol end use, by industry, 2008–2011
5	Diesel purchasing, by industry, 2011
6	Diesel end use, by industry, 2008–2011
7	Energy saving initiatives, by industry, 2011
8	Area where greatest energy saving could be made, by industry, 2011
9	Energy saving areas for priority, by industry, 2011
10	Total energy use across all sectors, by fuel type and industry, 2009–2011

Table 1a

**Energy use**  
By fuel type and industry  
2008–2011

Industry	Fuel type																		Total	
	Electricity		Petrol		Diesel		Fuel oil		LPG		Aviation fuel		Natural gas		Coal		Other <sup>(1)</sup>			
	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011
<b>Terajoules</b>																				
Agriculture	4,096.65	4,528.65	2,878.61	2,807.85	6,736.08	7,531.42	76.93	48.39	143.60	177.85	60.14	20.84	C	38.95	267.95	32.88	C	521.01	15,509.19	15,707.85
Forestry and logging	51.70	64.04	220.25	141.27	1,779.36	2,489.71	83.53	22.62	0.87	0.70	C	C	C	C	C	53.43	18.22	C	2,273.31	2,920.36
Aquaculture	19.75	16.89	21.51	9.46	125.56	87.07	1.13	0.18	1.36	1.11	C	C	C	C	C	C	3.27	C	172.70	114.79
Fishing	7.63	28.49	45.60	77.56	1,669.16	1,266.36	1,940.11	1,783.60	1.02	2.52	C	17.67	C	C	C	C	C	1.68	3,667.59	3,177.88
Services to agriculture, forestry, and fishing	187.75	245.92	322.23	396.65	2,734.98	2,983.17	8.39	C	27.26	17.82	552.61	325.41	4.20	5.94	1.88	C	19.53	34.44	3,858.82	4,013.03
Mining	1,823.84	1,714.07	39.06	55.14	4,868.41	4,838.71	79.33	C	119.41	93.40	13.83	12.74	2,965.02	2,127.15	C	85.53	C	C	9,996.47	9,070.93
<b>Total</b>	<b>6,187.32</b>	<b>6,598.06</b>	<b>3,527.26</b>	<b>3,487.93</b>	<b>17,913.54</b>	<b>19,196.45</b>	<b>2,189.42</b>	<b>1,993.80</b>	<b>293.50</b>	<b>293.39</b>	<b>638.29</b>	<b>377.01</b>	<b>2,973.39</b>	<b>2,172.13</b>	<b>464.95</b>	<b>173.02</b>	<b>1,290.40</b>	<b>713.05</b>	<b>35,478.08</b>	<b>35,004.83</b>

1. Includes other fuels not captured elsewhere, eg wood and woodwaste, steam and solar.

**Note:** Due to rounding, figures may not add to the stated totals.

The 2008 figures have been revised since being released in 2009. These revisions have been made because of better design data, increased knowledge and information about energy use in the sector after collecting this information for a second time and more robust procedures in applying special treatment.

**Symbol:**

C confidential

**Source:** Statistics New Zealand

Table 1b

**Energy use**  
By fuel type and industry, physical units  
2008–11

Industry	Fuel type																	
	Electricity		Petrol		Diesel		Fuel oil		LPG		Aviation fuel		Natural gas		Coal		Wood and woodwaste	
	Kilowatt hours (millions)		Litres (millions)		Litres (millions)		Litres (millions)		Litres (millions)		Litres (millions)		Terajoules		tonnes (000)		cubic metres (000)	
	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011
Agriculture	1,137.96	1,257.96	82.41	80.04	175.83	195.88	1.89	1.19	2.67	3.30	1.74	0.60	C	38.95	12.03	1.88	107.36	24.03
Forestry and logging	14.36	17.79	6.31	4.03	46.45	64.75	2.05	0.56	0.00	0.01	C	C	C	C	C	2.52	1.57	0.33
Aquaculture	5.49	4.69	0.62	0.27	3.28	2.26	0.03	0.00	0.02	0.02	C	C	C	C	C	C	0.28	0.02
Fishing	2.12	7.91	1.31	2.21	43.57	32.94	47.69	43.82	0.00	0.01	C	0.51	C	C	C	C	0.35	0.05
Services to agriculture, forestry, and fishing	52.15	68.31	9.23	11.31	71.39	77.59	0.21	C	0.21	0.16	16.00	9.42	4.20	5.94	0.08	C	1.68	1.77
Mining	506.62	476.13	1.12	1.57	127.08	125.84	1.95	C	4.48	3.51	0.40	0.37	2,965.02	2,127.15	C	3.53	0.01	0.04
<b>Total</b>	<b>1718.70</b>	<b>1832.79</b>	<b>100.98</b>	<b>99.43</b>	<b>467.59</b>	<b>499.26</b>	<b>53.82</b>	<b>48.99</b>	<b>7.39</b>	<b>7.01</b>	<b>18.48</b>	<b>10.91</b>	<b>2973.39</b>	<b>2172.13</b>	<b>20.87</b>	<b>7.98</b>	<b>111.25</b>	<b>26.24</b>

**Note:** Due to rounding, figures may not add to the stated totals.

The 2008 figures have been revised since being released in 2009. These revisions have been made because of better design data, increased knowledge and information about energy use in the 'sector after collecting this information for a second time and more robust procedures in applying special treatment.

**Symbol:**

C confidential

**Source:** Statistics New Zealand

Table 2

**Electricity end use**  
By industry  
2008–2011

Industry	Electricity end use				Total electricity	
	Business		Other <sup>(1)</sup>		2008	2011
	2008	2011	2008	2011		
	Terajoules (TJ)					
Agriculture	4,096.65	4,528.65	1,349.25	1,586.75	5,445.90	6,115.40
Forestry and logging	51.70	64.04	10.89	12.36	62.59	76.40
Aquaculture	19.75	16.89	0.99	1.28	20.74	18.17
Fishing	7.63	28.49	4.31	8.62	11.94	37.11
Services to agriculture, forestry, and fishing	187.75	245.92	44.32	56.42	232.07	302.35
Mining	1,823.84	1,714.07	0.61	0.87	1,824.45	1,714.95
<b>Total</b>	<b>6,187.32</b>	<b>6,598.06</b>	<b>1,410.36</b>	<b>1,666.31</b>	<b>7,597.69</b>	<b>8,264.37</b>

1. For example household use of farmers living on the farm.

**Note:** Due to rounding, figures may not add to the stated totals.

The 2008 figures have been revised since being released in 2009. These revisions have been made because of better design data, increased knowledge and information about energy use in the sector after collecting this information for a second time and more robust procedures in applying special treatment.

**Source:** Statistics New Zealand

Table 3

**Petrol purchasing**  
By industry  
2011

Industry	Petrol purchasing		Total petrol
	Petrol station or truck stop	Other <sup>(1)</sup>	
Terajoules (TJ)			
Agriculture	1,739.87	1,067.98	2,807.85
Forestry and logging	130.98	10.28	141.27
Aquaculture	7.94	1.52	9.46
Fishing	70.36	7.20	77.56
Services to agriculture, forestry, and fishing	331.38	65.27	396.65
Mining	46.84	8.30	55.14
<b>Total</b>	<b>2,327.37</b>	<b>1,160.56</b>	<b>3,487.93</b>

1. Other includes direct delivery.

**Note:** Due to rounding, figures may not add to the stated totals.

**Source:** Statistics New Zealand

Table 4

**Petrol end use**

By industry

2008–2011

Industry	Petrol end use								Total petrol	
	On-road		Off-road		Stationary machinery		Other <sup>(1)</sup>			
	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011
	Terajoules (TJ)									
Agriculture	1,415.22	1,332.59	1,358.88	1,405.54	95.41	64.41	9.09	5.32	2,878.61	2,807.85
Forestry and logging	104.31	60.31	47.76	46.75	68.11	C	0.07	C	220.25	141.27
Aquaculture	9.15	5.44	0.48	0.46	1.10	0.19	10.78	3.37	21.51	9.46
Fishing	29.15	32.60	0.68	4.13	C	0.76	C	40.07	45.60	77.56
Services to agriculture, forestry, and fishing	241.30	270.90	54.16	93.10	25.16	29.29	1.61	3.36	322.23	396.65
Mining	29.49	49.26	6.45	3.70	C	C	C	C	39.06	55.14
<b>Total</b>	<b>1,828.63</b>	<b>1,751.10</b>	<b>1,468.40</b>	<b>1,553.68</b>	<b>193.13</b>	<b>130.24</b>	<b>37.10</b>	<b>52.91</b>	<b>3,527.26</b>	<b>3,487.93</b>

1. Includes other fuel uses, eg marine use.

**Note:** Due to rounding, figures may not add to the stated totals.

The 2008 figures have been revised since being released in 2009. These revisions have been made because of better design data, increased knowledge and information about energy use in the sector after collecting this information for a second time and more robust procedures in applying special treatment.

**Symbol:**

C confidential

**Source:** Statistics New Zealand

Table 5

**Diesel purchasing**  
By industry  
2011

Industry	Diesel purchasing		Total diesel
	Petrol station or truck stop	Other <sup>(1)</sup>	
	Terajoules (TJ)		
Agriculture	2,976.93	4,554.49	7,531.42
Forestry and logging	926.74	1,562.98	2,489.71
Aquaculture	33.26	53.81	87.07
Fishing	229.39	1,036.97	1,266.36
Services to agriculture, forestry, and fishing	1,524.76	1,458.41	2,983.17
Mining	520.48	4,318.23	4,838.71
<b>Total</b>	<b>6,211.56</b>	<b>12,984.89</b>	<b>19,196.45</b>

1. Other includes direct delivery.

**Note:** Due to rounding, figures may not add to the stated totals.

**Source:** Statistics New Zealand

Table 6

**Diesel end use**

By industry

2008–2011

Industry	Diesel end use								Total diesel	
	On-road		Off-road		Stationary machinery		Other <sup>(1)</sup>			
	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011
	Terajoules (TJ)									
Agriculture	2,090.02	2,372.24	4,340.82	4,969.81	280.96	178.44	24.28	10.93	6,736.08	7,531.42
Forestry and logging	423.04	446.83	1,244.16	1,911.28	C	C	C	C	1,779.36	2,489.71
Aquaculture	16.03	10.89	1.44	7.02	1.68	0.37	106.41	68.80	125.56	87.07
Fishing	39.36	70.87	1.85	20.70	C	0.10	C	1,174.68	1,669.16	1,266.36
Services to agriculture, forestry, and fishing	1,334.60	1,254.06	1,368.70	1,651.71	C	C	C	C	2,734.98	2,983.17
Mining	396.34	608.84	3,928.06	3,912.62	C	226.53	C	90.72	4,868.41	4,838.71
										0.00
<b>Total</b>	<b>4,299.38</b>	<b>4,763.73</b>	<b>10,885.04</b>	<b>12,473.15</b>	<b>948.14</b>	<b>594.41</b>	<b>1,780.98</b>	<b>1,365.16</b>	<b>17,913.54</b>	<b>19,196.45</b>

1. Includes other fuel uses, eg marine use.

**Note:** Due to rounding, figures may not add to the stated totals.

The 2008 figures have been revised since being released in 2009. These revisions have been made because of better design data, increased knowledge and information about energy use in the sector after collecting this information for a second time and more robust procedures in applying special treatment.

**Symbol:**

C confidential

**Source:** Statistics New Zealand

Table 7

**Energy saving initiatives**

By industry

2011

Industry	Energy saving initiatives										
	Monitoring use or cost	Setting targets	Information for staff	Energy policy	Assigned responsibility	Energy audits	Benchmarking use	Energy management budget	Installing energy-saving technologies	Other <sup>(1)</sup>	No energy initiatives
	Percent <sup>(2)</sup>										
Agriculture	41	9	17	8	9	2	5	6	33	2	42
Forestry and logging	29	4	11	6	8	2	4	4	15	3	60
Aquaculture	35	8	18	5	8	0	5	5	20	5	58
Fishing	51	18	26	8	13	1	6	5	27	4	33
Services to agriculture, forestry, and fishing	40	7	17	7	10	2	4	5	23	1	44
Mining	49	19	30	22	12	4	10	3	28	0	40
<b>All primary sector</b>	<b>40</b>	<b>10</b>	<b>18</b>	<b>9</b>	<b>10</b>	<b>2</b>	<b>5</b>	<b>6</b>	<b>28</b>	<b>2</b>	<b>44</b>

1. Includes other initiatives not captured in previous categories.

2. The percentage of businesses that responded within the industry and the total for an industry may not sum to 100, as respondents may select more than one initiative.

Source: Statistics New Zealand

Table 8

**Area where greatest energy saving could be made**

By industry

2011

Industry	Area where greatest energy saving could be made								
	Space heating	Water, heating	Process heat <sup>(1)</sup>	Refrigeration	Electronics, appliances, lighting	Heavy machinery	Transport	Other <sup>(2)</sup>	No further savings possible
	Percent <sup>(3)</sup>								
Agriculture	3	15	0	5	5	11	17	3	39
Forestry and logging	2	4	0	0	2	18	14	2	57
Aquaculture	3	3	0	3	3	5	23	5	63
Fishing	0	2	0	4	4	7	24	7	48
Services to agriculture, forestry, and fishing	4	4	1	1	4	16	17	1	36
Mining	3	1	6	1	3	31	16	0	39
<b>All primary sector</b>	<b>3</b>	<b>9</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>14</b>	<b>21</b>	<b>3</b>	<b>42</b>

1. Includes industrial boilers.

2. Includes other initiatives not captured in previous categories.

3. The percentage of businesses that have responded, within the industry. The percentages for an industry may not sum to 100, due to rounding.

**Source:** Statistics New Zealand

Table 9

**Energy saving areas for priority**

By industry

2011

Industry	Energy saving areas for priority				
	High priority	Medium priority	Low priority	Not a priority	Don't know
	Percent <sup>(1)</sup>				
<b>Reduce energy costs</b>					
Agriculture	33	38	10	13	6
Forestry and logging	33	32	12	14	8
Aquaculture	18	25	10	40	5
Fishing	37	33	10	8	12
Services to agriculture, forestry, and fishing	23	26	11	32	7
Mining	34	31	10	19	6
<b>All primary</b>	<b>31</b>	<b>34</b>	<b>11</b>	<b>17</b>	<b>7</b>
<b>Reduce energy emissions</b>					
Agriculture	17	30	21	22	10
Forestry and logging	17	29	20	23	11
Aquaculture	15	23	15	40	10
Fishing	18	37	14	14	17
Services to agriculture, forestry, and fishing	15	23	18	37	7
Mining	27	28	15	21	7
<b>All primary</b>	<b>17</b>	<b>29</b>	<b>19</b>	<b>24</b>	<b>10</b>
<b>Increase energy efficiency</b>					
Agriculture	34	34	10	15	7
Forestry and logging	32	33	11	14	11
Aquaculture	25	23	8	35	10
Fishing	44	27	8	8	11
Services to agriculture, forestry, and fishing	26	23	10	35	6
Mining	36	31	3	21	10
<b>All primary</b>	<b>33</b>	<b>31</b>	<b>10</b>	<b>18</b>	<b>8</b>

For footnotes see end of table.

Source: Statistics New Zealand

Table 9 continued

**Energy saving areas for priority**

By industry

2011

Industry	Energy saving areas for priority				
	High priority	Medium priority	Low priority	Not a priority	Don't know
	2011	2011	2011	2011	2011
Percent <sup>(1)</sup>					
<b>Secure energy supply for future</b>					
Agriculture	35	24	13	18	10
Forestry and logging	26	26	13	21	14
Aquaculture	23	18	8	43	10
Fishing	35	24	12	14	18
Services to agriculture, forestry, and fishing	23	16	13	37	11
Mining	40	21	10	19	10
<b>All primary</b>	<b>31</b>	<b>23</b>	<b>12</b>	<b>22</b>	<b>11</b>
<b>Energy conscious business reputation</b>					
Agriculture	16	30	16	29	9
Forestry and logging	16	24	22	25	13
Aquaculture	15	20	13	45	10
Fishing	18	31	18	19	14
Services to agriculture, forestry, and fishing	15	18	14	46	8
Mining	25	30	12	22	10
<b>All primary</b>	<b>17</b>	<b>27</b>	<b>16</b>	<b>30</b>	<b>10</b>
<b>Workplace environment improvements</b>					
Agriculture	33	23	8	26	11
Forestry and logging	39	24	6	19	12
Aquaculture	30	15	5	45	8
Fishing	44	25	7	11	12
Services to agriculture, forestry, and fishing	27	15	8	41	7
Mining	46	24	6	13	10
<b>All primary</b>	<b>35</b>	<b>22</b>	<b>7</b>	<b>25</b>	<b>11</b>

1. The percentage of businesses that responded within the industry. The percentages for an industry may not sum to 100, due to rounding.

Source: Statistics New Zealand

Table 10

**Total energy use across all sectors**  
By fuel type and industry  
2009–2011

Industry	Fuel type						Total
	Electricity	Petrol	Diesel	Natural gas	Other petroleum products <sup>(1)</sup>	Other <sup>(2)</sup>	
<b>Terajoules (TJ)</b>							
Agriculture, forestry and fishing	4,883.99	3,432.79	14,357.74	44.98	2,421.56	792.84	25,933.90
Mining	1,714.07	55.14	4,838.71	2,127.15	242.64	93.22	9,070.93
<b>Primary sector total<sup>(3)</sup></b>	<b>6,598.06</b>	<b>3,487.93</b>	<b>19,196.45</b>	<b>2,172.13</b>	<b>2,664.20</b>	<b>886.07</b>	<b>35,004.83</b>
Manufacturing	49,536.51	1,839.28	8,483.87	24,881.07	6,705.09	75,626.98	167,072.79
Electricity, gas, water and waste services	1,869.89	186.78	1,509.00	7,569.16	50.03	3,819.19	15,004.05
Construction	1,811.20	4,416.22	13,904.13	346.17	85.95	169.37	20,733.04
Wholesale trade	2,394.17	2,133.50	4,183.74	165.69	115.12	51.07	9,043.29
Retail trade	6,800.06	2,190.87	1,015.05	53.50	93.12	28.68	10,181.29
Transport, postal and warehousing	2,675.56	3,127.32	38,086.85	97.82	20,154.14	535.44	64,677.14
<b>Industrial and trade sector total<sup>(4)</sup></b>	<b>65,087.37</b>	<b>13,893.98</b>	<b>67,182.65</b>	<b>33,113.41</b>	<b>27,203.45</b>	<b>80,230.72</b>	<b>286,711.59</b>
Accommodation and food services	4,378.75	501.84	182.80	1,432.68	472.92	451.89	7,420.89
Information media and telecommunications	1,984.61	477.48	134.31	36.69	37.92	5.74	2,676.76
Financial and insurance services	1,544.97	906.05	353.73	45.73	28.57	19.91	2,898.96
Rental, hiring, and real estate services	6,072.23	2,444.30	3,530.74	52.07	57.06	312.21	12,468.62
Professional, scientific, and technical services	2,128.91	2,182.75	1,048.65	98.20	15.78	61.50	5,535.79
Administrative and support services	901.27	1,301.22	615.05	29.85	48.02	55.64	2,951.05
Public administration and safety	3,281.95	1,502.13	1,530.42	422.52	C	C	10,598.36
Education and training	2,816.41	482.61	411.28	648.06	232.48	534.11	5,124.94
Health care and social assistance	3,827.08	1,054.81	264.86	1,435.22	166.97	783.84	7,532.78
Arts and recreation services	1,266.86	405.71	594.03	355.80	103.57	84.25	2,810.21
Other services	958.34	1,245.54	723.22	716.74	C	C	3,841.73
<b>Services sector total<sup>(5)</sup></b>	<b>29,161.39</b>	<b>12,504.45</b>	<b>9,389.08</b>	<b>5,273.58</b>	<b>1,256.22</b>	<b>6,275.38</b>	<b>63,860.08</b>
<b>All sectors</b>	<b>100,846.82</b>	<b>29,886.36</b>	<b>94,510.05</b>	<b>40,559.12</b>	<b>31,123.87</b>	<b>87,392.17</b>	<b>384,318.37</b>

1. Includes other fuels not captured elsewhere; eg fuel oil, LPG, and aviation fuel.

2. Includes other fuels not captured elsewhere; eg coal, wood and woodwaste, steam, and solar.

3. Collected for 2011.

4. Collected for 2009.

5. Collected for 2010.

**Symbol:**

C confidential

**Source:** Statistics New Zealand